**Abbott, Anet**  
Meghan Garcia, Megan Harrison, Sahar Shakoori  
**Faculty mentor:** Nora Dunbar, Daniel Weidler  

**Session I, 9:00am-11:00am, 71B**  
**Title: How Much Skin Does She Have to Show?**  
The goal of our study was to determine if the sex of the rater would influence the model's rated level of promiscuity, if skin exposure would have an influence, and if the two would interact to influence the ratings. There were three different levels of skin exposure. Participants were given one of three photos to rate promiscuity of the model on a 5 point Likert-type scale. Men and women between the ages of 18-25 participated in our research. We used a total of 200 hundred participants, 100 women and 100 men. Most of our participants were convenience sampled, the rest were quota sampled. During their participation in the survey, the participants were exposed to completing the survey in a public computer lab. Our team used online surveys to gather data for three different pictures of models. We expect to find an effect between participant sex and rated promiscuity of the model, an effect between skin exposure and promiscuity rating, and an interaction effect between sex and skin exposure on perceived promiscuity.

**Acquaviva, Nicole**  
Tiffani Watkins  
**Faculty mentor:** Christine Lemley  

**Session II, 2:00pm-4:00pm, 47D**  
**Title: Silence is Deadly: Culture in the Classroom**  
A quote that inspired our presentation was, Silence sends a strong message to children: This may be your reality but it is not the truth that we honor in this institution. You are here to discuss and write and learn about matters of more importance. We are coming together to share our creativity to discuss culture and how to implement it into the classroom. The topics we focus on are often ignored or not addressed and we find it crucial to involve students in topics that go on in the real world. We have formed lesson plans to display, bringing our ideas together to bring these aspects of culture alive in the classroom. They focus on cultural responsive teaching and culture of caring frameworks.

**Aguiniga, Patricia**  
Alexis Volta  
**Faculty mentor:** Corina Kellner, Margaret Nelson  

**Session I, 9:00am-11:00am, 56C**  
**Title: Living in the Ancient Andean Desert: Nasca Diet and Migration at La Marcha**  
The Nasca people of the south coast of Peru lived in an arid desert environment during the first millennium B.C.E. These maize agriculturists experienced many environmental, political, and social challenges in their history. The site of La Marcha is located in the Las Trancas Valley of the Southern Nasca Region (SNR), about 40 kilometers from the Pacific Ocean and may have functioned as an important ritual pilgrimage and burial site. From individuals excavated at this site, we analyzed stable carbon and oxygen isotope values in human bone and teeth to determine diet and migration patterns. What you eat and drink gets incorporated into body tissues. Carbon isotopic information can reveal
what kinds of plants and animals are eaten. Maize (corn), for instance, has significantly different carbon isotope values than potatoes. Oxygen isotopic information correlates with the type of water consumed, with different isotope values in arid and wet regions and at different altitudes. The La Marcha population may have eaten a diet primarily of maize, which was a staple of the Andean diet. Oxygen isotope values may show similar sources of water for these Nasca people, as water was difficult to get. However, immigration and status likely affected these assumptions at the popular ritual site of La Marcha. Studying the dietary and migration habits of the Nasca people helps us to understand how people flourished in extreme arid regions and the effects climate change has on the population.

Aiken, Shana
Tishena Nez, Amber Howard, Ilana Henderson

**Faculty mentor:** Jay Sutcliffe

**Session I, 9:00am-11:00am, 111A**

**Title: Child And Maternal Health Within the Flagstaff Community**

There is a great need for certified childcare providers in Flagstaff AZ. Currently there are only 4 certified care centers. To become certified you have to be over the age of 18, have all immunizations completed, TB tested, you must show proof that you are legally eligible to work in the U.S., you must pass a DES check, FBI check, and attend CPR training. The intervention program that we are developing will target those individuals who have an interest in becoming a certified childcare provider in Arizona. Our goal is to recruit interested individuals and link them with the resources and tools they need in order to complete their application and required certifications. In order to meet our goal we will be working with the program director for the Association for Supportive Child Care (ASCC) in Coconino County and participating in the Flagstaff Annual Child Care Fair. We will evaluate the effectiveness of our intervention program by the number of interested individuals we help by the end of the Child Care Fair. Currently there is only 1 interested applicant in Flagstaff working with ASCC.

Alahmari, Fahad
Sebastian Arevalo, Brad Evans, Tomas Garcia, Benjamin Gouveia, Fahad Alahmari, Jake Work

**Faculty mentor:** No mentor provided

**Morning, 9:00am-11:00am, CEFNS floor near 3A**

**Title: Next Generation 3D Printer**

No abstract submitted

Aldridge, Juanita

**Faculty mentor:** Miguel Vasquez

**Session II, 2:00pm-4:00pm, 56C**

**Title: Dating Methods Used in Anthropology**

Comparing dating methods across the field of anthropology. Explaining the importance of the different dating methods. Looking at radiocarbon dating, uranium dating, and phosphorus dating. Also comparing the different processes for which each dating method is gathered and its accuracy.
Allen, Gregory  
Faculty mentor: Francis Smiley

Session I, 9:00am-11:00am, 56D  
Title: The Archaeological Reconstruction of Caste in Southern Indian Villages  
The poster presents a visual and textual examination the material correlates of Gopalpur, a Southern Indian village, with the specific purpose of using material culture to understand social behavior. Modern archaeologists learn much about prehistoric societies by employing ethnoarchaeology to study the material correlates of present day societies. Archaeologists then develop testable hypotheses about past societies using the ethnographic data. The people of Gopalpur use the caste system to organize themselves economically, ritually, and socially. In Gopalpur, the people use the term jati for caste, and the material culture throughout the village reflects the realities of the jati system. The village of Gopalpur depends on agriculture and sheep herding subsistence strategies, and the farmer and shepherd jatis represent the largest portion of Gopalpur’s population. Using material culture and ethnographically known social rules, I demonstrate a model for reconstructing the jati system using materials likely to remain in the archaeological record. The model considers aspects of village political structure, economics, ritual behavior, and diet. Finally, the poster presents archaeological research of similar societies to ascertain the accuracy of the model.

Allen, Gregory  
Faculty mentor: Miguel Vasquez

Session II, 2:00pm-4:00pm, 56D  
Title: Analyzing the Zika Virus using Anthropological Theory  
The poster presents a visual and textual examination of cultural reactions to the spread of the zika virus. Large-scale problems such as infectious disease force people to change their behavior, often inspiring people to organize themselves in new ways. The project examines news stories pertaining to efforts to control the spread of the virus, as well as academic sources considering the structural inequalities present in the global health care system. The poster demonstrates a link between between prior inequality and risk of infection; as well as analyzing the role previously existing political, economic, and social institutions play in constructing culturally specific zika control strategies. Finally, the poster will present anthropological theories of cultural organization within the context of reactions to the zika virus. The project demonstrates the real world applications of anthropological theory to a widespread event with ongoing implications in our hemisphere.

Almanzar, Allison  
Faculty mentor: Amber Nicole Pfannenstiel

Morning, 10:30am-11:30am, Skydome East Concourse - ADA section  
Title: Designed Interactions of Edgy-White Liberal  
No abstract submitted

Almodovar, Anna - CANCELLED  
Faculty mentor: Miguel Vasquez
Session 1, 9:00-11:00am, 55A

Title: Life After Death: Cultural Perspectives on the Afterlife

My research will be presented on a poster through visual and textual information. Mass burials, burial practices/customs, and human sacrifice will be researched in both present and past societies to better understand how and why different cultures react to the concept of death. The purpose of this research is to better understand how death affects how people their life and what measures are taken in order to ensure life after death. I predict cultural customs, geographic location, and era will have an effect on how people perceive death.

Alsadi, Noor
     Matthew Sorenson, Jasem Alrumaidheen, Khaled Alazmi
     Faculty mentor: Wilbert Odem, Wilbert Odem

Session I, 9:00am-11:00am, 7D

Title: Museum of Northern Arizona Meadow Riparian Habitat Enhancement Project

The Museum of Northern Arizona would like to have a riparian area assessed and design alternatives to propose to the city of Flagstaff, Arizona. This site is located approximately 2.6 miles Northwest of Flagstaff City Hall and the well house where the stream begins is considered one of the last natural running springs in Flagstaff. Therefore, team Green-Grey-Engineering has proposed a project to restore the riparian spring habitat closely surrounding Coyote Springs and to improve the accessibility for the residents of the Peaks. The Peaks is a senior community that houses senior citizens, some with disabilities. That being said, any proposed ramps and sidewalks must follow the 2010 ADA Guidelines, provided by the Americans with Disabilities Act. The Museum hopes to promote plant diversity and preserve the cultural heritage sites while making the area more accessible for the senior community. The scope of services for this project will provide the goals and needs of the project by identifying each of the tasks needed to complete the final alternative designs. Coyote Springs is located between the Peaks Senior Living Community and the Museum of Northern Arizona's research campus. Further technical considerations that will take place will include removing old concrete infrastructure and piping, increasing the meandering channel and wet meadow habitat, and providing an environmentally appropriate trail to conduct an appropriate wetland vegetation land. Finally, team Green-Grey-Engineering will focus on including an educational aspect by installing educational signs, boards and creating brochures with valuable educational background and history of Flagstaff.

Alsadi, Noor
     Matthew Sorenson, Jasem Alrumaidheen, Khaled Alazmi
     Faculty mentor: Wilbert Odem, Wilbert Odem

Afternoon, 1:15pm-1:40pm, duBois Room A

Title: Museum of Northern Arizona Meadow Riparian Habitat Enhancement Project

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Althawab, Adel
Kyle Karshner, Christopher Hazel, Steven Sandavol
Faculty mentor: Wilbert Odem

Morning, 10:20am-10:45am, duBois Marshall Room

Title: Flood Risk to Hillside Mine Tailings Cap
The purpose of this project is to identify and map the potential damage to the Hillside Mine waste repository cap in the event of a catastrophic flood. Due to recent changes in yearly weather patterns the possibility of a 500 year event is greater. Arizona has been in a state of drought for fifteen years. The potential for wildfires is greatly increased versus years with average precipitation. Given that the Boulder Creek watershed extends into higher forested elevations, the possibility for fire damage on Bozarth mesa may also be a concern. Flash flooding is much more likely in areas affected by devastating fires. The goal of this project is to identify the potential damage to the Hillside mine cap in case of a massive storm event. If the current containment design is found inadequate, the project may lead to future designs. It is important to keep contaminants, such as heavy metals and acids, out of Boulder Creek.

Amin, Anisha
Faculty mentor: Melissa Santana

Session I, 9:00am-11:00am, 49A

Title: Wild Roots Cabaret & Bar
Wild Roots cabaret and bar is designed to be an atmospheric escape inspired by the 1920's. Located in Beverly Hills, California, this unique twist on a speakeasy provides some of the cities best mixologists who deliver a great variety of inspired and cleverly mixed drinks for the modern crowd as well as artisanal wines and spirits imported from France, Italy, Portugal and Spain. With bottles ranging from $130 and up, customers wont be disappointed with the unique and savory flavors from around the world, whether they are tasting a flight of wines or looking to try the perfect pairings.

Andrews, Breck
Faculty mentor: Brandy Judson
Session I, 9:00am-11:00am, 100C

Title: Behavioral Change: Anxiety

This assignment was to identify a behavioral change that I would like to make in my life. I chose general anxiety disorder. I have struggled with this disorder most of my life and I chose to take this opportunity to help control and cope with my anxiety. At the end of this project, my goal is to overcome my anxiety and to no longer have anxiety attacks.

Andrews, Willy  
Faculty mentor: Constantin Ciocanel, Cindy Browder

Session I, 9:00am-11:00am, 1C

Title: A solid polymer electrolyte for multifunctional material development

Development of multifunctional materials, particularly of materials with structural and power storage capability, has the potential to facilitate a reduction in weight and size or volume of a wide range of electro-mechanical systems. However, such developments require each material phase to contribute to all targeted material properties, leading often to diverging requirements for one or more phases. In this research, the focus was on reformulating a polyethylene glycol based electrolyte previously developed by our group, which was mechanically strong but exhibited low ionic conductivity (10^-7 S/cm). To improve its ionic conductivity, i.e. targeting 10^-3 S/cm, while preserving its structural strength, the electrolyte was reformulated by i) removing a plasticizer component, ii) adjusting the ratios of the chemical components, iii) using different ion sources, and iv) embedding nano-additives for increase conductivity and strength.

Andrews, Willy  
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 55A

Title: Prehistoric human supernatural beliefs and modern-day religion

Supernatural belief systems and mysticism are observable in a modern society which relies on a contradictory scientific and technological model. Despite the presence of clear evidence refuting many religious narratives, groups of modern-day humans celebrate blind-faith models to satisfy social and emotional needs. This antithetical religious following may indicate a common human predisposition for supernatural belief and perhaps religion as an evolutionary adaptation or consequence which can improve social coherence, acceptance of death, and exploratory powers. By carefully examining the origin of supernatural beliefs in early-human communities, it may be possible to improve our understanding of modern religion and its roots in human adaptation. With this project, an exploration of early-human artwork, symbolism, and burial practices at the archaeological sites Atapuerca, Qafzeh/Skhul, Lake Mungo, Mal'ta Buret, Chauvet, and Lascaux will be completed to illuminate the purpose of modern religion.

Arellano, Stephanie  
Cody Crozier, Chett J. Boxley, Andrew T. Koppisch, Mackenzie Harrison  
Faculty mentor: Andrew Koppisch, Chett J. Boxley

Session I, 9:00am-11:00am, 22B
**Title: Effect of Decyl Rhamnoside on Bacterial Biofilms**

Biofilms are an agglomeration of bacteria-colonizing surfaces that pose threat to human skin contact due to its effective bioadhesion facilitation. They are ubiquitous, and are found in medical instrumentation, household environments, food and beverage processing, oral hygiene, and etc. Bacterial biofilms remain and will persist becoming a serious issue for human health as they have been accounted for many severe cases in medical practice. The use of biochemical agents such as chemical surfactants like ionic liquids and detergents serve their purpose to disturb bacterial biofilms and neutralize pathogens while not causing irritation to the skin. Antimicrobial properties have been widely studied as they serve to aid in the reduction of bioadhesion. Innovative methods for biofilm reduction such as investigating the potency of valuable detergents such as decyl rhamnoside, was used as a possible surfactant for the diminution of biofilms by targeting bacterial membranes as well to reduce skin-based bacterial biofilms through their emulsifying characteristics. The objective of this experiment is to study the effects of a rhamnolipid biosurfactant, decyl rhamnoside to inhibit bacterial growth and test its properties against *Pseudomonas aeruginosa* and other clinically biofilm forming bacteria. Bacterial cultures were grown and measured through a UV spectrophotometer at 600 nm. The efficacy of the biosurfactant was tested using a biofilm assay and MIC (Minimum Inhibitory Concentration) as antimicrobial susceptibility tests. Ongoing research is being aimed to measure the effect of rhamnolipids against biofilms in relation to other commonly used biosurfactants.

_Arevalo, Gesselle_

Kayla South/Beck, Devin Cooper, Conner McCain  
**Faculty mentor:** John Houser

**Session I, 9:00am-11:00am, 71C**

**Title: Social Pressure and Short-Term Task Perseverance**

Our study focuses on short-term task perseverance and social pressure in a University setting. In this study we will be using a variation of the 'spot the difference game'. The variation is that it is an impossible task because the two pictures we will be providing are identical. Participants will sit down and have four minutes to spot the difference between the two 'chaotic' photos. Furthermore, there is no difference present thus it should take them the entire four minutes. The participants will be paired next to two confederates during the study. The confederates will 'find' the impossible difference early on. Our goal is to simulate social pressure by having other individuals (the confederates) finish the impossible task before and around the participant being observed. We will also give the participants an option to use three hint cards. These cards will offer erroneous information that will attempt to aid them in solving the puzzle. Additionally, we have made it known that this is a competition, the sooner the participant finishes the task, the more points they obtain. We also made it known that using a hint card drastically affects the overall score of the individual. After a participant chooses to use any one of the three hint cards we will record their time. This is the time that we will use to measure their short-term task perseverance in relation to the participants we measure with no confederates around.

_Armstrong, Laura_

**Faculty mentor:** Becky Butcher

**Session II, 2:00pm-4:00pm, 126B**

**Title: Accidental Deaths and Injuries from Sleepwalking**
Almost everyone has known someone who sleepwalks. It is an odd happening that is mostly entertaining but sleepwalking can also be dangerous. Because it is a phenomenon that happens in unusual circumstances it is significantly undocumented. Neuroscientists are still in the beginning stages of researching causes and observing occurrences. My research focuses on the consequences of sleepwalking and the relatively thin data on adults that have suffered injuries or death from sleepwalking disorders.

Arreola, Jessica  
Faculty mentor: Brandy Judson

Session II, 2:00pm-4:00pm, 100C

Title: Behavioral Change
Each student is required to identify a behavioral change they wish to implement into their life for 9 weeks. The behavioral change I wish to implement into my life is to receive more sleep and improve the overall quality of the sleep I receive. I currently sleep 4-5 hours per night and I would like to modify this behavior and receive 7-9 hours of sleep per night. Not only will I monitor the amount of sleep I receive, but I will also develop necessary habits to receive better quality sleep. Some of these habits include: developing a regular sleeping pattern, time management, reducing caffeine intake, and limiting day time napping. I will discuss some of the observed effects this behavioral change has had on my life. In addition, I will discuss what I have learned about the planned change process. Lastly, I will discuss the overall outcome of my 9-week behavioral change and how this assignment will impact work with future social work clients.

Arzola, Hugo  
Faculty mentor: Jay Sutcliffe

Session I, 9:00am-11:00am, 110D

Title: Physical Activity at Summit High School
The purpose of our program is to promote physical activity at Summit High school to student's grades 9-12. Our planning model we used is MAPP-IT because it helps us figure out the needs and plan goal settings for our target population. There will be a pre-test and post-test that they will take regarding their knowledge about proper form and calculating heart rate. The Diffusion of Innovations theory sorts out the level of motivation among the students. In order to achieve behavior change, incentives will be provided (pedometers, water bottles) in order to build competition and apply concepts after high school.

Asgari, Niku  
Faculty mentor: Nora Dunbar, Daniel Weidler

Session I, 9:00am-11:00am, 71D

Title: Happiness in Relation to Maslow's Hierarchy of Needs
Many researchers have aimed to find variables that contribute to an individual's happiness. This study investigates the relationship between happiness and Maslow's hierarchy of needs. We hypothesize that
there is a difference between men and women for each level of Maslow's hierarchy of needs and happiness and that there is a difference in which level of Maslow's hierarchy of needs is most important to happiness between men and women. A survey was given to college students to find which level of Maslow's hierarchy of needs (physiological needs, safety needs, love needs, esteem needs, and self-actualizing needs) was correlated highest with happiness. We anticipate our results will indicate that love needs will be most significant to happiness across both sexes.

Atayde, Anthony
  Savannah Hillebrand, Teddy Jemmings, Katie Mergen, Edwin Perez
  Faculty mentor: Cassie Dakan

Morning, 10:00am-11:00am, Skydome Stage D
Title: Understanding Everyday Compassion
What is compassion, and how is it different from empathy, or other behaviors in the compassion family? Can it be/become a way of life? Research into human psychology, biology and neurology offers answers, and humans demonstrate the compassionate response toward self and others in myriad ways, including religious practice, and even in cooking! Learn more about compassion from some thought provoking angles.

Atkinson, Tyler
  Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 100D
Title: Behavioral Change Project: Increasing Spirituality
This project presentation includes a behavioral change plan to increase spirituality by incorporating regular prayer, study of religious text, meditation, and keeping a spiritual journal. The progress of change is recorded over a 9 week time span and then related to how social work practitioners can better promote desired change for clients.

Atkinson, Tyler
  Kyle Guevara, Chelsea Dyer, Erika Tweed, Hailey Spilman
  Faculty mentor: Jaime Clem

Session II, 2:00pm-4:00pm, 72C
Title: Relationships and Academic Success
Our research outlines the relationship between relationship status and academic success in college. Our findings were taken from surveys given to students taking SW355 Social Work Research Class from Professor Jaime Clem.

Auge, Connor
  Cody Stein
  Faculty mentor: Lisa Chien

Session I, 9:00am-11:00am, 9D
Title: Star Formation in the Interacting Galaxy Pair: Arp256
Merging galaxy systems provide a wealth of information on how galactic star formation is affected by these interactions. The interacting pair of Arp 256 is a collision between two spiral galaxies where one has twice the mass of the other. The galaxies have just passed their first close encounter, having a separation of 29 kpc, and they have distinguished tidal bridges and tails. These galaxies are luminous in the infrared with the accompanying generation of highly luminous X-ray sources, which are expected in interacting galaxies. Past studies have suggested two different star formation mechanisms in interacting galaxies: the shock induced and density-dependent rules. Models incorporating both star formation rules create star formation similar to observations in a large scale, but differ in specific regions of the galaxies such as tidal tails and bridges. Through examining the two galaxies in Arp 256, we create models to determine whether shock induced star formation or density-dependent star formation produces the accompanying effects in the observed burst of galactic activity. We present our comparison of our models to the young cluster ages and distributions and the known star formation rate of Arp 256, to examine which model produces a better analog to observations.

Aurand, Amanda
Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 126A
Title: How technology and global awareness, together, have influenced the fashion industry
Many things have changed since the inception of the internet. This technology has spread globally, synonymously with environmental awareness. Perhaps this friendly trend is a mutualistic sort, however, both have affected each other greatly as they continue to spread and influence all walks of the earth. Personally, I run a vintage and handmade clothing company focusing on reused, recycled and reusable clothing and fabrics. I have seen a drastic change in the shoppers dynamic as well as the dynamic of the market as it strives to compete with the ever growing from home market. Technology has made a lot of every day tasks easier and has made a lot of things simpler. Are we seeing a social trend and change? Yes, we are. So many factors go into this shift and what we do with this information and technology could change the buyers trend indefinitely.

Austin, Samantha
Faculty mentor: Jeff Berglund

Morning, 9:00am-11:00am, Skydome CAL table
Title: Who Defines Native Identity?
White people have been assigning and maintaining created roles, personalities, values, and cultures for Native Americans for years. From films to novels, PSAs to comics, gallery censorship to history books, white America is an expert at distorting what it means to be Native. For my symposium project, I will be pitting these hegemonic white voices against the authentic, powerful, and necessary voices of Native Americans that have been ignored for so long. On a 22’ x 30’ sheet of watercolor paper, I will produce a piece of art that combines my own illustrations and paintings with chosen excerpts and quotations in a collage style to represent the ways in which Native Americans are (and have been) represented by Euro-Americans on one side and the ways in which Native Americans tell their own stories (through film, comics, activism, art, literature, etc.) displayed on the other. This art piece will not only challenge viewers to question their preconceived notions of Nativeness taught to them by American schools, governments, and media, but it will also encourage them to explore and discover
manifestations of indigenous voices that deserve attention and appreciation. I will provide a list of the materials that will be featured in the Native voice side of my work for viewers to peruse and experience first hand after the symposium.

Avilez, Ian  
**Faculty mentor:** Lisa Prato  
**Session I, 9:00am-11:00am, 9C**  
**Title:** Confirming Disk Presence and Determining Temperature for Young Multiple Star System TWA 3  
Determining parameters, such as temperature, is an important step in understanding planetary formation and stellar evolution in young stars. TWA 3, a multiple star system consisting of a spectroscopic binary (TWA 3a) and a visual tertiary (TWA 3b), is a young system that can give insight to the early stages of these processes. We collected data with the Discovery Channel Telescope and combined it with data compiled from the literature. The Spectral Energy Distribution (SED), which we created, confirmed the presence of a potentially planet-forming, circumbinary disk of dust and gas around TWA 3a. The SED also confirmed that the visual tertiary, TWA 3b, has no disk. We used a blackbody model to determine the temperature of each component of the system.

Ayon, Angelica  
**Faculty mentor:** Brandy Judson  
**Session II, 2:00pm-4:00pm, 100D**  
**Title:** Binge Eating Disorders  
This project discusses a behavioral change I have selected to change which is eating habits and how it relates to binge eating disorders, what the causes of these disorders are, and ways to treat this disorder. I have suffered with obesity most of my life and was diagnosed with having a binge eating disorder second semester of my freshman year of college. Due to my family medical history of diabetes and my grandmother dying of congestive heart failure, I am now determined to change my eating habits so that I am in a healthier physical and emotional state of mind.

Bacchi, Devon  
**Faculty mentor:** Becky Butcher  
**Session I, 9:00am-11:00am, 126C**  
**Title:** The Seeds of Change: How Adopting a Plant-Based Diet Can Transform Your Health  
Americans are facing a serious health epidemic. Heart disease, cancer, stroke, and diabetes are some of the top causes of death in our nation. Our culture's idea of health is treating the symptoms rather than the cause. There is overwhelming evidence that eating a plant-based diet greatly reduces the risks of developing these diseases, and can even reverse the disease in many cases. I will go into depth on how different foods react in our bodies biochemically. The more we understand what is happening within our bodies, the more we can do to heal it and experience true health.

Backer, Kyle  
**Faculty mentor:** Marie Baker-Ohler
Session I, 9:00am-11:00am, 87A

Title: Creating Spaces: Weaving Dwelling and Acknowledgment into the American ESL Classroom

No matter the target language, learning a new way of making meaning is a daunting task. English has become the language of business, and the demand for individuals to know the language shows no signs of slowing. Learning English as a second language (ESL) in America brings with it a unique set of challenges. ESL education in the United States was first conceived as a way to assimilate immigrants into American society. Today, ESL classrooms accept the aspect of cultural hybridity, but many pedagogies still operate under a native/nonnative speaker dichotomy. These binary categorizations fail to take into consideration each student's cultural background and depth of linguistic knowledge. This paper examines ESL pedagogy through a phenomenological lens, using communication scholar Michael J. Hyde's concepts of acknowledgment and dwelling place. Hyde argues that acknowledgment is a life-giving gift that everyone seeks and gives, whether it be through verbal communication or physical touch. Dwelling place taps into Martin Heidegger's idea of Being—or Dasein. Hyde contends that through acknowledgment, a dwelling place can emerge where individuals can freely examine their Being together without fear of judgment. In looking at ESL pedagogy—including the physical space in which instruction occurs—through these metaphors, this study argues that ESL pedagogy should give teachers agency to adapt their lesson plans to fit the individual needs of the students. Doing so creates a space where students feel comfortable in sharing their lived experiences, which leads to greater investment in language learning.

Badertscher, Lauren
Tiffany Tran, Tanya Sutton
Faculty mentor: Stephen Shuster

Session I, 9:00am-11:00am, 33A

Title: Variation in the intensity of infection by Echinostoma metacercaria in bullfrog tadpoles from four northern Arizona habitats.

Echinostoma is a trematode parasite known to encyst as metacercaria within the kidneys of amphibian larvae. The bullfrog, Rana catesbiania, breeds throughout northern Arizona. This study examined the relationship between water source, tadpole developmental stage, and the intensity of Echinostoma sp. trematode infection among 4 northern Arizona aquatic habitats [Rio de Flag (RDF), JD Dam (JD), Frog Tank (FT), and Schultz Lake (SHL)]. Four tadpoles were collected from each site, scored for Gosner developmental age, euthanized, and their kidneys were preserved. An additional 18 tadpoles (RJ) were collected from RDF and maintained in JD water for 45 days before euthanization and preservation. We estimated the intensity of infection as the average number of metacercaria observed on each kidney surface when viewed under a dissection scope at low power in 5 trials. We used 2-way ANOVA to examine the relationship between tadpole age (AGE), habitat location (HABITAT) and their interaction (AGE*HABITAT) on the average number of metacercaria per kidney. All but 2 tadpoles were infected by trematodes (prevalence=97%), but RDF and RJ tadpoles had higher parasite intensities. Infection intensity increased with AGE in only in RDF tadpoles. Moreover, the infection intensity of RJ tadpoles did not differ from that of similar-aged RDF tadpoles, suggesting that RJ tadpoles became infected at RDF. Our results suggest that tadpoles in the Rio de Flag are either more likely, or more susceptible, to suffer trematode infections than in other northern Arizona locations.
Badertscher, Lauren  
Samuel Salgado, Cara Blout, Amelia Allen  
**Faculty mentor:** Taylor Joyal

**Session II, 2:00pm-4:00pm, 21C**  
**Title:** *Wildlife Camera Trapping Project in Tuzigoot and Montezuma Well: Random placement versus strategic placement*  
Tina Greenawalt with the National Park Service is working on a wildlife camera trapping project in Tuzigoot National Monument and Montezuma Well National Monument. There have been cameras set up at random locations throughout the parks for six weeks at a time. Greenawalt used the random point generator on ArcMap to generate the location for the cameras. Ten cameras were placed at random locations in each park. In addition, Tuzigoot has placed one camera that has a strategic location that has been there for several years and Montezuma Well has three cameras that have strategic locations. Greenawalt used a draft of Saguaro National Park's protocol as a basis when designing this project. The objective of this project is to compare the species on the randomly placed cameras to the cameras that have designated locations to see if the random ones provide a good representation of the species present in the parks. Our team examined the photos taken from both sites and identified wildlife, added metadata, and organized the wildlife data. We used PhotoMechanic software to add the metadata (location, time, date, etc.) We sought to determine whether or not the random camera locations provide accurate representations of biodiversity and abundance in the parks. Additionally, our team gained skills in using ArcGIS and PhotoMechanic software in wildlife identification, metadata applications, and field research. Our final product is a report describing techniques used to compare random camera placement to cameras placed in known locations, data analysis, results and references cited.

Baechler, Autumn  
**Faculty mentor:** Laura Blank

**Session I, 9:00am-11:00am, 117C**  
**Title:** *Cooling Caps in Reducing Chemotherapy Induced Alopecia*  
Chemotherapy agents are utilized for a multitude of diagnoses and involve an array of side effects. One side effect that holds physical and emotional impact is chemotherapy-induced alopecia. Scalp-cooling caps function in reducing hair loss by constricting blood vessels and therefore limiting the uptake of chemotherapy agents through hair follicles. As nurses caring for patients during these life-changing experiences, it is imperative to provide support through increasing comfort and quality of life. The proposed study is to determine how utilizing scalp-cooling caps throughout the course of intravenous chemotherapy treatment, with a known side effect of alopecia, can reduce chemotherapy-induced alopecia. Three articles were analyzed in evaluating the effectiveness of scalp cooling caps in reducing chemotherapy-induced alopecia, and it was determined the effects differentiate between solid cancerous tumors and hematological cancers.

Baker, Austin  
Sarah Trunzo, Nancy Fossgreen  
**Faculty mentor:** Nora Dunbar, Daniel Weidler

**Session I, 9:00am-11:00am, 72A**
Title: Emerging Adult and Anxiety

This study is looking at the various dimensions of emerging adulthood and its correlation to general anxiety. The hypothesis is that there is a correlation between the scores on an anxiety scale and the scores on an emerging adulthood scale. This will be done by administering an electronic survey to 125 students in multiple research methods classes. The survey consists of the State Trait Anxiety Inventory for Cognitive and Somatic Anxiety, with its two subscales for state and trait anxiety, and the IDEA emerging adulthood scale, and its six subscales that looks at the various facets of emerging adulthood, which are whether or not this time is self-focused or other-focused, is this a time of possibilities and experimentation, a time of identity exploration, a time of negativity and instability, or a time of feeling in-between. It will also include demographic questions, such as gender and age. We anticipate to find a correlation between the subscales of the IDEA scale and the State Trait Anxiety subscales.

Balavitch, Jessica
Matt Page
Faculty mentor: Laura Blank

Session I, 9:00am-11:00am, 117D

Title: The Effects of Hourly Rounds on Patient Safety

Patient safety is a primary focus of nursing within acute care settings, and it has been determined that the implementation of hourly rounding policies has a positive correlation with increased patient safety. This poster examines the current status of patient safety in relation to hourly rounding within Kingman Regional Medical Center (KRMC). Hourly rounding is the practice of the nurse entering each patient's room every hour and assessing for any needs or discomforts, rather than simply waiting for the patient to alert the nurse to these needs. Within KRMC, there is no formal policy in place but rather a series of guidelines and suggestions regarding rounding upon patients hourly. Recommendations are provided within this poster, suggesting that those within nursing leadership positions, such as charge nurses or nurse managers, encourage the nursing staff to round upon patients hourly.

Ballard, Sabrina
Faculty mentor: Robin Tuchscherer

Session I, 9:00am-11:00am, 8A

Title: Use of Photogrammetry to Measure the Condition of Existing Structures

According to the American Society of Civil Engineers (ASCE) 2013 report card, the Nation has a grade of a D+ in infrastructure. This is because civil infrastructure in the United States is reaching the end of its expected service life. Demolishing and replacing infrastructure is unsustainable both from an economic and environmental standpoint. There is a need for new methods in verifying the remaining life of the engineered environment, and photogrammetry (the science of making measurements from photographs) will satisfy this need. The purpose of this study is to validate the use of photogrammetry for determining strains and crack widths. This will be accomplished by loading a 6x6x18 inch concrete block and comparing strain measurements calculated from photogrammetry to those of strain gauges or extensometers. This project also compares crack width measurements from high-resolution orthorectified photographs to those obtained using a crack comparator card or microscope. This research is unique due to the scale of the project, and because strain measurements rather than deflections are being analyzed. Upon conclusion, it is anticipated that traditional measurement
techniques (strain gauges, extensometers, crack comparator card, and microscope) will yield similar results to those obtained from photogrammetry. The implication of these results is that professional engineers can adopt photogrammetry methods to assess the condition of existing structures. With a large amount of infrastructure failing and in need of repairs, this research will benefit the engineering community because it is a robust and quantitative means of assessing the condition of the Nation's infrastructure.

Ballesteros, Alexander
Students of Ethnic Studies 470
Faculty mentor: T Mark Montoya

Session II, 2:00pm-4:00pm, 97A
Title: The Performance, Politics and Gender Dynamics of Alter Egos in Hip-Hop
Many hip-hop artists develop performative identities, also known as alter egos, as a gateway to connect with their various audiences, preserve their personal identities outside of the public sphere, and exercise their political consciousness and voice. This research analyzes various hip-hop artists and their alter egos to deconstruct how the performance of these identities serve and allow for the political navigation of the intersectionalities between race, class, gender and sexuality in hip-hop. The embodiment of performative identities forms the necessary backdrop for asking critical questions about the political existence and agency of an artist: What are the purposes and repercussions of these alter egos and how do they serve the artist? How do these alter egos play a role with the authenticity and street credibility of an artist? Do alter egos function differently for women artists than their male counterparts and do these functions create credible spaces for the female voices in hip-hop? How do alter egos play a role in the attempt to defy societal expectations in the performance of race, class, gender, sexuality and their intersections?

Banuelos, Adrian
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 55B
Title: Archaeology of weapons and warfare
The transition and expansion of clovis point weapons used in North America and some of the theories on how the weapon ideas traveled to North America

Bao, Qiaoqi
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 35B
Title: The Future of the National Debt
This paper analyzes historical data in different economic sectors and predicts future trend about the national debt of the United States, aiming at answering the question of whether the United States will pay off its national debt. Other than the Federal Reserve, which is largest Treasury bond buyer, the research focuses more on the repayment to the largest external buyer in China. In addition, further questions will be answered followed by the two possible results.
Barbera, Dylan
   Taylar Grossman
   Faculty mentor: Chad Woodruff

Session II, 2:00pm-4:00pm, 80D
Title: Empathy in Motion: Self-Other Dynamics of Moving vs. Static Emotional Stimuli
Previous investigation into Electroencephalographic (EEG) mu-rhythm suppression (8-13 Hz) during action-observation vs. execution tasks has indicated that self-other differences in mu suppression are related to measures of perspective taking. Further study has shown that simply observing self- vs. other-related stimuli elicits this relationship as well. In the current study, we sought to investigate the necessity of motion perception in mu suppression and its discrimination between self and other. In separate blocks, participants were presented with both videos and pictures of either themselves or others expressing 1 of 4 emotional faces: happy, sad, angry or neutral. Results revealed significant mu suppression differences in self vs. other processing in response to video stimuli while no significant mu suppression self-other differences were seen in response to still photographs. Additionally, a significant self-other difference was seen in mu suppression data of the motion condition. These data provide evidence for modulated self-other discrimination in mu-suppression that is facilitated by the presence of motion.

Barnes, RJ
   Faculty mentor: Chris Johnson

Session II, 2:00pm-4:00pm, 85C
Title: Alone Pantone
Alone Pantone is a game app that focuses on educating new designers about pantone colors (the standardized colors that are used for printing purposes). The way that it does it is your character, Lux, is helping his towns people get back their prized gems from Nox. The gems all are pantone colors and once you gather each one and complete the level, you learn something new about them. The entire game is also based off of a tilting orientation to acquire each gem and you avoid enemies that are guarding the gems.

Bartman, Emily
   Garrett Steffen, Dakota Jones, Yi Zong
   Faculty mentor: James Palmer

Session II, 2:00pm-4:00pm, 6C
Title: Exponential Perspective Rendering Engine
Exponential perspective is an artistic technique where the size of an object in two dimensions is related exponentially with its perceived distance from the observer in three dimensions (as opposed to a linear relationship with distance, i.e. linear perspective). That is, objects that are farther away are smaller, and the relationship between how far away the object is and how it is scaled is exponential, so for every unit of distance between the observer and the object, the object will be scaled to half of its original size. The nature of this projection allows the object to maintain geometrical consistency as it is scaled, as well, where as in linear perspective, the shape of an object would also change as its distance from the observer changed. This projection technique and its properties were first formally described
by Dr. James Palmer. We demonstrate one application of this concept and through the design and implementation of a single-level video game and its rendering engine using the properties described and the mathematics derived from the formal description, as well as analyze the challenges and benefits associated with rendering in exponential perspective.

Bartman, Emily  
Garrett Steffen, Dakota Jones, Yi Zong  
Faculty mentor: James Palmer

Morning, 8:55am-9:20am, duBois Meadows Room

Title: Exponential Perspective Rendering Engine

Exponential perspective is an artistic technique where the size of an object in two dimensions is related exponentially with its perceived distance from the observer in three dimensions (as opposed to a linear relationship with distance, i.e. linear perspective). That is, objects that are farther away are smaller, and the relationship between how far away the object is and how it is scaled is exponential, so for every unit of distance between the observer and the object, the object will be scaled to half of its original size. The nature of this projection allows the object to maintain geometrical consistency as it is scaled, as well, where as in linear perspective, the shape of an object would also change as its distance from the observer changed. This projection technique and its properties were first formally described by Dr. James Palmer. We demonstrate one application of this concept and through the design and implementation of a single-level video game and its rendering engine using the properties described and the mathematics derived from the formal description, as well as analyze the challenges and benefits associated with rendering in exponential perspective.

Barton, Michelle  
Faculty mentor: Jim Skinner

Session I, 9:00am-11:00am, 12D

Title: Analysis of Geomorphic Features, and Inter-Crater Basin Strata of Hadriacus Cavi, Mars through Large-Scale Geologic Mapping and Section Correlation

Hadriacus Cavi are located in the southern region of Hadriacus Palus, a 160-km long by 80 km wide inter-crater plain, located northeast of Hellas Planitia in the Martian cratered highlands. The cavi are irregularly-shaped depressions that expose outcrops of layered, basin-filling sediments that provide crucial details about the complex depositional history of the palus. These stratigraphic deposits display interesting geomorphic features consisting of fluvial channel bodies, columnar jointing, and faulting. Images taken by the High Resolution Imaging Science Experiment (HiRISE) provide a detailed, close-up perspective of the Martian landscape, and were used to correlate stratigraphic sections, and produce a large-scale (~1-6,000) geologic map of a sub-set area of the palus. Using ArcGIS, the surface features were mapped and measured, and the geologic units were delineated and described. These observations are consistent with deposition (and subsequent exhumation) of material in an extensional basin, perhaps related to the Hellas giant impact event.

Batchelder, Ryan  
Eric Huff, Christopher Marcus, Jonathon Todd  
Faculty mentor: Eck Doerry
Session I, 9:00am-11:00am, 7A

Title: Toogether - A lightweight group organization tool
From concerts to conferences to a day on the slopes, groups of friends enjoy doing things together. Although the group may split up repeatedly as everyone does their thing, they coordinate, meet up again, and generally hang out together fluidly throughout the day. Unfortunately, it is managing exactly this fluid group coordination that is problematic. Someone is always taking the wrong door, or can't find the meeting place...and maintaining a sense for where everyone is at any moment in impossible. Text messaging and phone calls tend to be inefficient, with half the time spent trying to describe where everyone is. Many 'chat' applications exist, but these require memberships and lengthy setup, and still don't help with the physical location of group members. Our Toogether application provides fresh take on lightweight group organization, with effortless instant group creation, easy-intragroup communication, and a map view to track the location of all members.

Batchelder, Ryan
  Eric Huff, Christopher Marcus, Jonathon Todd
  Faculty mentor: Eck Doerry

Afternoon, 3:05pm-3:30pm, duBois Meadows Room

Title: Toogether - A Lightweight Group Organization Tool
From concerts to conferences to a day on the slopes, groups of friends enjoy doing things together. Although the group may split up repeatedly as everyone does their thing, they coordinate, meet up again, and generally hang out together fluidly throughout the day. Unfortunately, it is managing exactly this fluid group coordination that is problematic. Someone is always taking the wrong door, or can't find the meeting place...and maintaining a sense for where everyone is at any moment in impossible. Text messaging and phone calls tend to be inefficient, with half the time spent trying to describe where everyone is. Many 'chat' applications exist, but these require memberships and lengthy setup, and still don't help with the physical location of group members. Our Toogether application provides fresh take on lightweight group organization, with effortless instant group creation, easy-intragroup communication, and a map view to track the location of all members.

Baxter, Matthew – presentation by Scott Kelso
  Faculty mentor: Stefanie Kunze

Session II, 2:00pm-4:00pm, 67B

Title: How has the overrepresentation of Maori in the New Zealand criminal justice system arisen and what effect has it had on contemporary Maori society?
Maori (the indigenous people of New Zealand) make up 15% of the New Zealand population and just over 50% of the prison population. The over representation of Maori in the New Zealand criminal justice system has drawn criticism from many scholars and the United Nations. Maori are also over represented in the most deprived living areas in New Zealand and have more health problems than non-Maori. This project addresses Maori's history with crime and how this correlates with their current position within society today.

Bayles, Scottie
Vanice Hoepfner, Melissa Jacquez

Faculty mentor: Cassie Dakan

Afternoon, 1:15pm-1:45pm, Skydome Roundtable R3

Title: Traditional Ecological Knowledge + Technology = Future Survival
Humans must imagine and plan for a more sustainable energy and food future. Ideas about sustainability often come from ancient knowledge and practice. How will old and new technologies merge solve some of today's pressing environmental problems? Join the discussion.

Beach, Dylan
Mackenzie Ross
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 88C

Title: A Review of Present-Centered Therapy and its efficacy for treating PTSD
The efficacy of Present-Centered therapy for Posttraumatic stress disorder (PTSD) has been examined in recent psychotherapy trials. The purpose of our current project is to conduct a systematic literature review and quantitative-meta-analysis to evaluate the research evidence to quantify the effect of present-centered therapy on symptoms of PTSD. SLR and meta-analysis are critical in evaluating the effect of therapies on certain disorders, by critically analyzing all the relevant information that is available and quantifying the effectiveness of it. Method: electronic databases including PsycINFO and PubMed will be searched consistent with best practice standards (Preferred Reporting Items for Systematic-REviews and Meta-Analysis protocols; PRISMA-P (Shasmeer, et al., 2015) for randomized control trials (RCTs), other literary reviews and meta-analyses in which Present-Centered Therapy was compared to a control condition. Results: Methodology and results of located clinical trials that meet inclusion criteria will be reviewed and summarized. For the meta-analysis, the effect size for each clinical trial will be calculated. Then, an overall effect size statistic will be calculated for all of the trials. These statistical analyses will be conducted using the statistical program, Comprehensive Meta-Analysis (CMA) software, Version 3. Conclusion: Key findings of the systematic review and meta-analysis will be summarized, strengths and limitations of the published clinical trials will be noted, and suggestions for future research will be offered.

Beall, Paula
Faculty mentor: Miguel Vasquez

Session II, 2:00pm-4:00pm, 55B

Title: Language Barriers In The Medical Field
I have worked in the medical profession for a number of years and have worked with the Navajo's in Northern Arizona. While I have been working with them I have seen that there is a problem with communication at times, between the Navajo traditional language and English. I feel that this is a problem that people in the medical field have with the communication when dealing with life and death issue of a person. I think that with some kind of awareness that maybe the problem can be addressed and that there could possibly be some changes for the better.

Bebo, Ariana
Lukas Merkley, Amy Sanderson

**Faculty mentor:** Cassie Dakan

**Afternoon, 1:15pm-1:45pm, Skydome Roundtable R1**

**Title:** The Future of Medicine and Motion

Consider enhanced humans. Consider improved medical procedures that create these humans. Consider the capacities humans will need to endure long space travel. Join the conversation to explore future innovations that will make this possible.

**Becenti, Leandra**

Erica Zuniga

**Faculty mentor:** Jay Sutliffe

**Session I, 9:00am-11:00am, 111B**

**Title:** Summit High School After School Program

The purpose of our intervention was to increase the number of participants at Summit High Schools after school program. Anthony Gobe, site mentor, provided a space for students to exercise after school. Summit High School as an alternative school in flagstaff, AZ that aims to provide more specified education for the students in attendance. SHS students come from low socioeconomic backgrounds, have behavioral issues, are academically behind and/or are adjudicated. Throughout the four weeks of our intervention we aims to positively increase the students attitudes towards exercise and nutrition, and hoped to see them implement changes within their current lifestyles through their own self-efficacy.

**Becerra, Amorette**

Carter Bryce, Mariah Block, Joran Lehman

**Faculty mentor:** Nora Dunbar, Dan Weidler

**Session I, 9:00am-11:00am, 72B**

**Title:** The Effect of State and Trait Anxiety on Performance

We are investigating the effect of a time constraint on task performance and how overall performance on that task might be affected by anxiety. We will be conducting this experiment on PSY302w students during their lecture time. The research questions that we are asking are: How does a time constraint impact anxiety? and Does anxiety affect performance on a task? We will have two conditions (1: Time constraint, 2: two minute time limit) where in each group the participants will complete a demographic form, label the map with the name or abbreviations of the states, complete a STAI questionnaire, lastly we will debrief our participants and give them a piece of candy.

**Becker, Monica**

**Faculty mentor:** Miguel Vasquez

**Session II, 2:00pm-4:00pm, 62A**

**Title:** Death Rituals of Europe

This project will look at and discuss death rituals in Eastern and Southern Europe, between the fifth and fifteenth centuries. Through different sources and cultures, this project will discuss and
demonstrate diverse burial practices of the Balkan areas and the cultures within this territory. The methods practiced by the Ancient Greeks, as well as the possibility and strong belief of vampirism in Eastern Europe. I will explore the differences in techniques practiced during the burial process of the dead, and look at different ceremonial events that take place after a death has occurred in a culture. This project will show some of the rituals and procedures taken when burying the dead and how the legacy of the deceased will be remembered throughout history. The material objects used to recognize the dead vary across cultures. This is seen in the location where the dead were buried as well as the material objects that mark their grave and in which the material correlates that are buried and left with them in the afterlife. It will also look into the different beliefs of an afterlife and what happens to the spirits and souls of the deceased. Throughout the project, the diverse ways of looking at death will become apparent through different cultural practices and beliefs as well as the valuable materials of the deceased.

Beeman, Baylee

**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 55C**

**Title:** The Archaeology of Music in North America

In this presentation, I am exploring the archaeology of music in North America. Archaeology is the study of human history through the physical remains. I chose to explore this topic because it matches my interest in music.

Begay, Sean Paul

Johnelle Hoskie

**Faculty mentor:** Douglas Sutton

**Session I, 9:00am-11:00am, 118A**

**Title:** Type II Diabetes Mellitus: Language Barriers and Management

Understanding Type II Diabetes Mellitus can be very difficult for the newly diagnosed client. Medications, information and characteristics of the chronic disease can overwhelm the client, leading to issues in both the short and long term. Type II Diabetes Mellitus coupled with language barriers amplifies how information can become misconstrued and confusing. By combining language barriers with Type II Diabetes Mellitus, what issues occur and what solutions can health care professionals implement to reduce problems for Non-English speaking patients?

Belenti, Thalius

Marley Kelso, Kendall Weber, Caleb Wheeler

**Faculty mentor:** Cassie Dakan

**Afternoon, 1:15pm-1:45pm, Skydome Roundtable R2**

**Title:** Social Landscapes of the Future

The future is here. It is complicated. Perhaps most evidently in how technologies change society and human psychology - overtly and covertly. Think privacy, anxiety, romance, and integration of artificial intelligence into everyday life. What will be the new normal? Join the conversation.
Bell, Laura
Sarah Thiel
**Faculty mentor:** Christine Lemley

**Session I, 9:00am-11:00am, 48A**

**Title:** The Cultural Implications of Reclaimed Water on Snowbowl

The spraying of reclaimed water on the San Francisco peaks not only presents an issue of ignorance towards Native American culture but also confronts a pressing issue of potential environmental dangers for Snowbowl and it's surrounding areas. The consideration of cultural practices of the 13 Native tribes who recognize the peaks as sacred land, have been ignored and disrespected. While it is not on any specific Native reservation, these tribes do consider it to be a vital piece of their religious heritage. Furthermore, the environmental implications of the treated sewage is unknown and a very real potential danger for both the mountain and those capitalizing on it's recreational activities.

Benedia, Michael
**Faculty mentor:** Stefanie Kunze

**Session I, 9:00am-11:00am, 92D**

**Title:** Environmental Issues on Indian Reservations

In my research, I will discuss the environmental issues that affect Native American reservations. Access to water is limited and is heavily influenced by toxic waste disposal from resource extraction, like coal or uranium mining. Access to water is limited and is heavily influenced by toxic waste disposal from resource extraction, like coal or uranium mining. Fracking is also a huge concern, not only because of the damage it does to the earth, but the fact that it harms the Native’s sacred land. In my research I address what type of action is needed to prevent more harm to both Native Americans and their land.

Bergstrom, Kira
Laura Jachimowicz, Lucinda Yazzie, Carly Lenhardt, Gina Garabaldi
**Faculty mentor:** Jamie Clem

**Session I, 9:00am-11:00am, 99A**

**Title:** Effect of Employment Status on Student Academic Success

In this survey we will be studying the effect that having a job has on students and their academic success. Factors include number of credit hours being taken and number of hours working each week.

Bermudez, Amanda
**Faculty mentor:** Gregory Busath

**Session II, 2:00pm-4:00pm, 72D**

**Title:** Sexual Harassment on College Campuses: Creating Safe and Effective Training and Policy

The purpose of this literature review is examining the many scholarly sources regarding sexual harassment and assault in college and university campuses. The literature led to the formation of the belief that policy and training regarding sexual harassment and assault prevention are not up to date and that new theories and procedures exist that are more effective at prevention and education about
sexual harassment and assault than currently implemented doctrine. These evidence-based practices are more relevant and should be implemented. The affects of sexual harassment can be devastating especially to individuals who are attempting to pursue higher education and believed they were living and learning in a safe and educationally enriching environment. Making sure that knowledge about the effectiveness of policy and training are known can be that important next step to make university and college campuses change how they interact with this issue in many forums.

Berner, Sydney
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 35C
Title: How Planned Parenthood Effects the Economy
I examined the foundation of Planned Parenthood and the economic side of the organization of where the funds for Planned Parenthood come from, how they are spent, as well as, how Planned Parenthood effects the overall economy based on funds, opportunities, and other leading factors of the organization. Overall, the question is whether Americans should continue to fund Planned Parenthood as much as the United States currently does, why or why not and what are the costs of funding Planned Parenthood, as well as, what is the effect of cutting costs to Planned Parenthood? All of these questions were answered through research of the family planning programs focused specifically on the Planned Parenthood Federation of America.

Bertilson, Ashley
Brenna Kelly, Allison Gray
Faculty mentor: Liz Greenberg

Session I, 9:00am-11:00am, 118B
Title: Making Bedside Report the Standard in Critical Care Units at Summit Healthcare Regional Medical Center
There is no current policy for patient handoff, though the evidence suggests that when an enforced handoff policy is in place, patient outcomes are improved. Our goal is to implement evidence based practice into nursing care at Summit Healthcare Regional Medical Center. Bedside report is encouraged in the Emergency Department, but no official policy is in place. Bedside report is not encouraged in Intensive Care Unit. Implementing bedside report increases patient safety and nurse satisfaction (Shin, Woods, & Young, 2015). Standardization of information included in report minimizes errors and improves patient safety (Holly & Poletick, 2014). Evidence supports implementation of a policy requiring bedside nursing report and standardization of report in order to increase patient safety and there is no current policy at Summit Healthcare Regional Medical Center. Outcomes from bedside reporting include fewer patient falls, better pain management, improved patient safety and care, promotion of National Patient Safety goals, improved communication between nurses, improved patient involvement in the handover of care and improved patient satisfaction.

Berzunza, Liliana
Jill Griffin
Faculty mentor: Sumner Sydeman
Session II, 2:00pm-4:00pm, 73C

Title: *Post Traumatic Stress Disorder: A Meta-Analysis on the Effect of Exposure Disorder*

Post Traumatic Stress Disorder: A Meta-Analysis on the Effect of Exposure Disorder

**Objective:** Many clinical researchers have studied the effectiveness of Exposure Therapy for Post Traumatic Stress Disorder and Substance Abuse Disorder. The purpose of this particular study is to conduct a systematic review to see the effectiveness of Exposure Therapy on those suffering from Post Traumatic Stress Disorder and Substance Abuse Disorder while also conducting a meta-analysis. A systematic review and meta-analysis combines multiple trials to find whether a treatment is truly effective in helping a disorder which is an important element in clinical psychology because finding a more effective way to help those with a disorder.

**Method:** PubMed and PsychINFO were used to find non-randomized controlled trials and randomized controlled trials that involved Exposure Disorder compared to a controlled condition. Results: Articles will be reviewed to make sure that they meet inclusion criteria. The effect size of each trial will be calculated for the meta-analysis. Then, the overall effect-size statistic will be calculated for all the trial put together. A statistical program, Comprehensive Meta-Analysis (CMA) software, Version 3, will be used to conduct a statistical analysis.

**Conclusion:** There will be a summary of the findings that were conducted via the systematic review and meta-analysis. Then strengths and limitations will be given, as well as suggestions for future research.

Bilagody, Cherae
Monica Yellowhair, Mark Linhart, Sonora Olivas, Emily Kaufman, Heidie Hornstra, Greg Caporaso, Peter Lance, Talima Pearson

Faculty mentor: Talima Pearson, Heidie Hornstra-ONeill

Session I, 9:00am-11:00am, 32D

**Title: Microbial Involvement with Colorectal Cancer**

This research project is part of a broader study examining the connection between microbial communities and colorectal cancer. Bacteria in the human gastrointestinal tract secrete secondary bile acids including carcinogens such as deoxycholic and lithocholic acid. The presence of these compounds is speculated to contribute to the development of colorectal cancer, or CRC. Previously, we found that treatment with ursodeoxycholic acid (UDCA) in patients that had colorectal adenomas, a precursor to CRC, had a significant shift in the composition of their bacterial communities when compared to a placebo group. We now seek to determine the bacterial species present and total bacterial load in these patients pre- and post-treatment. To do so, DNA extracted from fecal samples from patients in this study were genetically analyzed using a real-time PCR assay targeting the bacterial 16S region. Differences in bacterial load between treatment and placebo groups, and between males versus females in the treatment groups will be discussed. Changes between microbial communities in patients given different cancer treatments, or pre- and post-cancer treatment, provides significant information about the role microbes may play in the development of CRC. Our findings will assist in the development of assays for detection of specific bacterial species that may be linked to development of CRC.

Bin, Junchi
Wesley Yazzie, Alejandro Rhyne, Abel Perez, Keith Vicente
**Faculty mentor:** Richard Hofstetter, David Scott,

**Morning, 10:45am-11:10am, duBois Southwest Room**

**Title: Bark Beetle Deterrent**
The bark beetle is an invasive species that infects forests across the world, leaving blue-stained fungus inside trees which leads to an accelerated death. The invasive nature of bark beetles is financially detrimental to homeowners, national parks, and tree owners. Dr. Hofstetter has developed an audio signal that sonically targets bark beetles, which interrupts their communications and prevents them from infiltrating more trees. Using computer aid design and sophisticated circuit design. The device contains state-of-the-art technology to broadcast audio signals for forest protection during the breeding season of bark beetles. It helps the operator protect trees for residential, commercial, and industrial use by using the device to prevent bark beetle infiltration and damage.

**Binkley, Amanda**
Corin Hill, Abbey Johnson, Zeke Saxman
**Faculty mentor:** Cassie Dakan

**Afternoon, 2:00pm-3:00pm, Skydome Stage D**

**Title: Too Much/Too Little Ego and Compassion**
Do you and those you know have a quiet or noisy ego, what are the signs and characteristics of each, and how is the ego linked to compassion? Presenters will explore these questions based on research into ego and compassion in Eastern and Western societies, in the medical and psychological professions, and in studies on narcissism.

**Bishop, Caity**
**Faculty mentor:** Miguel Vasquez

**Session I, 9:00am-11:00am, 56A**

**Title: The Effects of Decolonization in the United States**
This research project analyzes the realities of decolonization of Native Americans within the United States. There is a misconception among Americans that all Native Americans are well taken care of by the Federal government, when the truth of the matter is only Federally Recognized tribes receive support. The Bureau of Indian Affairs has set membership rules that are based off of blood quantum and lineal descent. Meanwhile present science is trying to quantify the validity of being Native through DNA. These means of recognizing a Native American are all western ideals. These western ideals are now being reflected in tribal government policy where tribes are faced with the dilemma of having to choose who can be Native enough to gain membership and who is not. Furthermore, many policies such as set reservation lands and prohibiting new people to join tribes creates a very limiting atmosphere with the ever present outlook of decreasing populations on the reservations. A goal of this project is to start a conversation on the truth about decolonization and how the ideals of the colonizers never stop oppressing the colonized. Concepts of authenticity, assimilation and sovereignty will be used to convey the actualities of decolonization within the United States. A recommendation of how to move forward given the knowledge conveyed in this poster will also be given.

**Bixler, Tatum**
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 55C**

**Title:** Domestication of Plants in Thailand

This project focuses on the domestication of plants in Spirit Cave Thailand. It also will focus on the agriculture use and provide examples of food the Hoabinhian people grew for self use.

**Bjerk, Molly**  
Ashley Mutck, Katelyn Johnson, Shayna King  
**Faculty mentor:** Anne Scott

**Afternoon, 1:15pm-2:00pm, Skydome Stage B**

**Title:** The Peaks Senior Living Community: Improving the Lives of its Residents

Four students in Dr. Scott's HON 394 course on Civic Engagement became involved in a meaningful service-learning experience at The Peaks Senior Living Community. Under the guidance of volunteer coordinators, students interacted with residents through word games, library organization, memory work, and conversations. Through their volunteering and subsequent research, students learned about the strengths and the weaknesses of the current volunteer efforts at this senior community, the nature of the residents' needs, and ways to address particular concerns both here and in the larger regional/national community. Students will present the context for their service learning, facets of the local as well as national issues involving senior communities and senior care, and proposals for improving the quality of life for seniors who live in such communities.

**Blair, Laura**  
Alexandria Sutphin, Jeff Baranowski, Zane Holditch  
**Faculty mentor:** Stephen Shuster

**Session I, 9:00am-11:00am, 32C**

**Title:** Differential effects of sperm limitation on family sex ratios in the parasitoid wasp, Nasonia vitripennis

We examined the effects of sperm limitation, host scarcity, genetic background and social conditions on family sex ratio in the parasitoid wasp, Nasonia vitripennis. Females in this species are known to bias their family sex ratios by controlling whether ova are fertilized, producing daughters, or remain unfertilized, producing sons. These wasps are a model system for testing Hamilton's Local Mate Competition (LMC) theory, which predicts that female wasps will bias their family sex ratio to optimize mating opportunities for their male offspring. Our previous work has shown that the family sex ratios of females ovipositing on unparasitized (1o) pupae can become male biased when multiple ovipositions cause females to exhaust their sperm supplies, as indicated by a gradual increase in the proportion of males within families. To determine whether this same effect occurs in females ovipositing on already parasitized (2o) pupae, we used wasps of two distinct eye colors (SE, OE) to track changes in clutch size and sex ratio across a sequence of 8 ovipositions. We allowed females of each eye color to alternate as 1o and 2o ovipositors, and we adjusted the time between ovipositions to simulate host scarcity. We found that: (1) female wasps were not sensitive to changes in host scarcity; (2) SE and OE females differed in clutch size and in the degree to which fecundity influenced male bias in secondary offspring sex ratios; (3) sperm limitation was expressed in 1o OE and SE families,
but not in 20 families. We conclude that both sperm limitation and genetic background exert important influences on observed patterns of Nasonia sex ratio manipulation.

Blakely, Willem
Emeli Filelds, Lyrica Jensen-Maldonado, Michael Stoy, Alexandra Ware
Faculty mentor: Cassie Dakan

Morning, 9:00am-10:00am, Skydome Stage D
Title: Applied Mindfulness and Wellbeing
Calm and focused attention in the present moment - mindfulness - has social and psychological benefits. Panelists will examine these benefits related to social networking technologies, overcoming human suffering, social justice, and in reducing depression and anxiety.

Blocker, Lanae
Kolbi McDaniel, Matt Wilkins, Rielly Spillman
Faculty mentor: Dennis Foster

Session II, 2:00pm-4:00pm, 35D
Title: Social Security
We will be exploring why the social security system is flawed and is not projected to be able to supports itself in 5 to 10 years. We will also suggest some possible solutions on how to reorganize the system and why it seems that there is so much hesitation on privatizing and reforming the social security system.

Boggs, Daniel
Faculty mentor: Abe Springer, Vaden Aldridge

Session I, 9:00am-11:00am, 21B
Title: The Comparison of Aquifer Recharge Rates in the Flagstaff Area
The purpose of this research is to measure the recharge rate of aquifers in the Flagstaff area. To do this, the method of chloride mass balance was used to look at the recharge rate. The procedure of this project include measuring the chloride coming in with precipitation, washing away with runoff, and looking at the amount that is in the groundwater at various points around the sample site. The sample site used contains both thinned and un-thinned forest, stream, and prairie areas, so a correlation between vegetation densities and recharge rate could be compared. This project is part of a larger project that analyzes how forest thinning affects water runoff, snow accumulation, soil moisture, evaporation, and aquifer recharge rate. It is important to look at these aspects in order to understand how thinning or overgrown forests affect our groundwater supply. In conclusion, I predict that thinned forests will have a higher recharge rate than overgrown forests.

Boothroyd, James
Cassidy Klovanish, Anneliese Martinez, Rebecca Beresic-Perrins, Stephen Shuster
Faculty mentor: Stephen Shuster, Rebecca Beresic-Perrins

Session I, 9:00am-11:00am, 32A
Local adaptation in leeches: estimating the relative fitness of three northern Arizona Helobdella modesta populations in natal and non-natal water

Helobdella modesta is a predaceous leech that is known to provide extensive post-zygotic parental care to offspring. Preliminary studies suggest a high degree of habitat specificity within this genus. To investigate whether natural populations are locally adapted, we conducted a fully-factorial, reciprocal water transfer experiment, in which pairs of leeches from each of 3 northern Arizona populations [Whitehorse Lake (WHL), JD Dam Lake (JDD), and Rio de Flag (RDF)] were maintained in separate glass jars containing natal, non-natal and filtered water (Control; 12 cells x 20 pairs x 2 leeches =480 leeches). We changed water and fed leeches twice weekly. Each week for 12 weeks, we recorded three fitness proxies: (1) the number of surviving individuals, (2) the number of individuals who produced eggs, and (3) the number of eggs each leech produced within each cell replicate. We estimated the absolute fitness of leeches in each cell by dividing the number of successful individuals at each selection episode, by the total number of individuals for that cell. We estimated the relative fitness of leeches in each cell by dividing each absolute fitness by the average fitness for all leeches over all cells. We compared relative fitnesses using standardized difference tests. For all leech populations, and for all fitness proxies, relative fitness was consistently higher in natal water, suggesting that H. modesta has adapted to its local habitats.

Borhani, David Dawood
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 36A
Title: Driving and Fines
Traffic conditions in Doha Qatar and externalities of irrational behavior, and externalities.

Borny, Samantha
Rachel Otero, Kaitlin Ringueberg
Faculty mentor: Tricia Moore

Session I, 9:00am-11:00am, 109B
Title: Which Type of Sealant is Best? Resin Vs. Glass Ionomer
More than one in five American's have untreated dental decay (caries). Sealants are a preventative measure against caries, which create a barrier between the tooth and an acidic environment within the oral cavity. Northern Arizona University's Dental Hygiene students placed different types of sealants as part of clinical and public health programs. Resin sealants were placed in a clinical setting and Glass Ionomer (GI) sealants were placed in a school-based setting. The purpose of this study was to compare retention and caries rates for the two types of sealant materials. Six months after sealant placement, Resin sealants had a 71% retention rate compared to GI sealants retention rate of 26%. Caries were present in 5% of the children who received GI sealants, and none of the children who received resin sealant.

Bourke, Patrick
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 55D
Title: Pathways of Animal Domestication
I have chosen to follow the pathways in which humans domesticated animals. The project will focus on the methods used for domestication and the key animals that were domesticated with that method. The specific three pathways chosen are the commensal, prey, and directed domestication. The project will also follow the timeline and touch on key places and time periods the exemplify the pathways focused on in domestication.

Bowen, Kathryn
Faculty mentor: Britton Shepardson
Session II, 2:00pm-4:00pm, 55D

Title: The Prehistory of Nutrition
For my project I have chosen to do the Prehistory of Nutrition. I have chosen this topic because nutrition is key in everyday life. As humans we must eat to survive. I want to find out what humans have eaten over time. I would like to look at nutrition in humans from 200,000 years to the last 10,000 years. Nutrition has evolved majorly due to agriculture in the last 10,000 years and this has changed the nutrition that humans eat. By nutrition I want to look at what humans were eating weather or not they were hunters, gathers, or in agriculture. With this being said I would also like to know which type of nutrition was the healthiest out of the three ways humans were getting food at this time but also was disease higher even if the foods they were eating were healthy. I plan to do a poster for my final project.

Bowerman, Steven
Faculty mentor: Britton Shepardson
Session I, 9:00am-11:00am, 54A

Title: The Growth of Trade Leading to the Silk Road
This project analyzes the archaeology of the progression of trade leading up to the Silk Road. It focuses primarily on the growth of trade, as well as the physical means that allowed for the growth of trade more so than the cultures or goods involved. That is not to say that the cultures and goods are ignored, but the physical aspect of trade is the primary point of study. The project studies trade leading up to the Silk Road, because it was one of the largest, most well-known trade routes in history.

Box, Carolyn
Colby Collins, Deavila dePersia, Michael Sloan
Faculty mentor: Tina Greenawalt, Taylor Joyal
Session II, 2:00pm-4:00pm, 18D

Title: The Restoration of Native Flora at Montezuma Well
The Back Cabin was a residence in the 1890s that is now a National Historic Site located at Montezuma Well National Monument. Montezuma's Well itself is is a collapsed limestone cavern that has filled with water and was used by the Sinagua Indians. The vegetation and soil around the cabin has been recently damaged during a restoration project with the goal of preserving the building. The task at hand is to develop an action plan for the restoration of native landscapes around the Back Cabin site using sustainable irrigation. Factors such as soil types, climate, existing irrigation systems, water
quality, native vegetation and the potential need for future maintenance will all be considered during
design of the restoration plan. The diversity of species planted along the west side of Back Cabin will
be dependent on the availability of materials as well as previously established flora around the cabin.
Due to its status as a National Historic Site located on a National Monument, there are also
considerations that must be made to ensure the restoration plan keeps with the cultural as well as
ecological value of the land. Our recommendations must consider the value of the land as a historic
site, as well as take into account possible budget constraints. This restoration plan will facilitate the
reestablishment of native flora and implement an irrigation system on the west side of the historic
Back Cabin located at the well. Our final result will include a restoration plan that details the list of
species, planting map and desired techniques that will ensure optimum success at the site.

Box, Emelia
Faculty mentor: Melissa Santana, John Cauvin

Session II, 2:00pm-4:00pm, 49B
Title: An Adaptable Hotel for any Culture: Designing Universally
Getting a good night's sleep when staying at a hotel is ultimately what you are paying for when you
travel. When you get a bad night's sleep due to loud noises in the hotel, uncomfortable beds,
distracting design, etc, then a hotel is failing it's guests. Therefore, my project is to create and design a
hotel in Wimbledon, London, that accommodates for many different cultures and people to ensure
everyone can enjoy their hotel experience to the fullest. Research has shown there are flaws in hotel
design currently, and that they do not cater to all guests from different nationalities. Those who are
from different countries have to adapt to the norms of that country, rather than having aspects of their
own in the hotel. It is shown the more people feel at home, the more comfortable they will be in the
space, and the more likely they will stay there again. The concept for my hotel is to design a modern
space that is neutral in color, with options for guests to adapt their personal suites with movable
partition walls, choice of linens and cushions, and choice of comfort of their beds. Tennis courts, spa
and gym facilities, as well as conference rooms will all be in one convenient space for guests to
explore, as well as provide excellent facilities for the professional tennis players to use over the
summer months when they are playing the Wimbledon Championships.

Boyle, Annalee
Cindy Sloan, Celeste Zavala
Faculty mentor: Will Cordeiro

Morning, 9:00am-10:00am, Skydome Stage C
Title: Today's Transgender Prison Issues in Relation to Orange is the New Black
This Powerpoint presentation will explore various issues that affect the transgender population of the
prison system. It will also look at the television show Orange is the New Black and examine the
accuracy of its representation of this population and its issues today.

Braganza, Megan
Katelyn Mikel, Emily Janssen, Daisy Romero, Destinie Gee
Faculty mentor: Nora Dunbar
Session I, 9:00am-11:00am, 73A

Title: Support Given and Received Based on Gender for those Coming Out
The purpose of this study is to observe if gender plays a role in the amount of support given to a close friend coming out, as well as if the gender of the close friend coming out affects the amount of support received. We hypothesize that there will be a difference in the support given and received based on both the gender of the person giving the support and the gender of the person receiving support. Our sample will consist of college students from a midsize university located in the south western United States. The method we will use for data collection is through a questionnaire given to the students in the listed classes above. Although we haven't conducted our analyses yet, we anticipate that there will be a statistically significant difference in the amount of support given and received based on gender.

Bridges, LC
Faculty mentor: Melissa Birkett, Lucas Klein

Session II, 2:00pm-4:00pm, 130B

Title: Alternate Ways to Create Soundproofing Materials
My project will explore the different ways to create soundproofing materials using only household or less expensive resources than what is used in actual soundproofing. All alternative methods will be compared with the industry standard in soundproofing material in order to see similarities and differences. The goal of my research is to prove that alternative methods can be used to effectively soundproof a room without using actual soundproof material.

Briggs, Hunter
Faculty mentor: Ryan Firch

Session II, 2:00pm-4:00pm, 36B

Title: Economic Analysis of the Keystone XL Oil Pipeline
The central theme of this paper is to discuss the micro and macro economic benefits of the proposed Keystone XL Oil Pipeline in the United States of America. There are a number of issues that I will be focusing on throughout the course of this paper. One of the major issues that have kept the Keystone oil pipeline from being put into action are the negative consequences it has on the environment. There are many macro economic benefits that the pipeline has the ability to produce. The real question is, are these macro economic stimulations worthy of the negative consequences the project proposes as well. Throughout the course of this paper, a cost-benefit analysis of the pipeline will be done as well.

Brooks, Kendall
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 54A

Title: Domestication of animals in the Middle East
My Topic is the domestication of animals. I will be focusing on the Middle East since there are are a large variety of mammals that could be domesticated in that location. The time period was around 9,000 years ago In the Middle East. The Domestication of animals began first in the Middle East due to farming and sheep. Domestication of animals led to larger populations too. I will specifically look at
the benefits and consequences of sheep and cattle. The second thing I will look at is population growth and life expectancy based on increase in animals.

Brown, Erin  
Faculty mentor: Brandy Judson  

Session II, 2:00pm-4:00pm, 99A  
Title: Behavior Change: Becoming Interdependent  
This project documents a behavior I wanted to change. The behavior I am changing is my dependence on others. I have documented small steps in order to become interdependent, and comfortable being on my own.

Brown, Kayla  
Faculty mentor: Britton Shepardson  

Session I, 9:00am-11:00am, 54B  
Title: Prehistory Of The Domestication Of Plants  
I will strongly focus on the topic of the domestication of plants starting in the Pre-Pottery Neolithic A period. I plan on studying the fertile crescent and continue to compare different regions and different species of plants. I will also go into the cultures and talk about the uses for each plant in the popular cultures.

Brown, Sarah R L  
Kaila J VanSumer, Nicholas M James, Heidi A Wayment  
Faculty mentor: Heidi Wayment  

Session II, 2:00pm-4:00pm, 73D  
Title: Importance of Friendship and Life Satisfaction: Does Being in A Romantic Relationship Matter?  
Past research suggests that friendships are not as important for college who are dating compared to those who are not (Demir, 2010). The purpose of the research project was to replicate these earlier research findings in a sample of college-aged students (N = 468, Males = 58, Females = 410, average age = 18.56, SD = .99). In all of our analyses, we controlled for age and gender. Importance of friendship was measured with a scale that included two items from the Flourishing Scale (Diener, 2009), and three items that we created. We predicted and found that, compared to those in a dating relationship, single college students, would rate their friendships as more important, F(1,450) = 4.13, p = .04. We also found that those in a relationship scored higher on the Life Satisfaction Scale (F(1,450) = 11.63, p < .001). Taken together, our results not only supported our hypotheses, but also supported previous research suggesting that romantic relationships are one of the most significant relationships in emerging adulthood. That is, among college students in a romantic relationship may have important esteem needs met through that relationship. Future research could benefit from measuring the gender makeup of one's friends and dating partners to determine if same sex or opposite sex friendships and romantic relationships are impacted differently from being in a romantic relationship.
**Brown, Taylor**  
**Faculty mentor:** Douglas Sutton

**Session I, 9:00am-11:00am, 118C**

**Title:** Alcohol Withdrawal Syndrome and Treatment  
Ethanol affects a variety of neurotransmitters. Long-term usage with sudden cessation leads to autonomic hyperactivity that occurs during Alcohol Withdrawal Syndrome. In the adult population within the United States, 8% of primary care and hospitalized people have alcohol associated withdrawal symptoms. These symptoms include tremor, delirium, and altered vital signs. The purpose of this poster is to discover in adult medical surgical patients with AWS, does the Clinical Institute Withdrawal Assessment scale (CIWA) compared to the Richmond Agitation Sedation Scale (RASS) reduce medication use or improve patient outcomes?

**Budell, Quincy**  
Kirsi Griner, Jessica Whitney, Jazmine Palmas  
**Faculty mentor:** Jay Sutliffe

**Session I, 9:00am-11:00am, 111C**

**Title:** Would you Like a Cup of Tea?  
We will be going into BASIS Flagstaff, a charter school in Flagstaff, Arizona, and work with students grades 10 through 12. This age group is high school students who are currently learning about sexuality and need to be prepared to handle any situation with knowledge and confidence. With this group, we will be discussing what consent is and the consent laws in Arizona. We will be giving before and after surveys of what they may know or not know about consent. We will be giving presentations with the use of videos and activities to help in students understanding.

**Burns, Krystal**  
**Faculty mentor:** Brandy Judson

**Session I, 9:00am-11:00am, 99B**

**Title:** A New Healthy Lifestyle  
For me to have a healthy lifestyle I want to change my eating habit. I feel I have been damaging my body by eating unhealthy and not consuming the proper water amount of water intake. The research contributing to this project is the advice of a professional health coach as well as internet research. In order for me to become healthier I not only need to eat the right nutrients but also become more active. By working out and researching the proper weight for my height I will be able to become healthier and feel better about my lifestyle.

**Bute, Shelby**  
Emily Baldwin, Kelly Chappell, Emily Favour  
**Faculty mentor:** Tricia Moore

**Session I, 9:00am-11:00am, 111D**

**Title:** What Parents Need to Know About Oral Health and Disease Prevention
Early Childhood Caries is a common oral disease amongst children around the world. The purpose of this study was to determine if there was a relationship between parent/caregiver knowledge and behaviors about oral health and the state of oral disease presented in their children. Thirty-two parents that attended the First Things First Health Fair in Flagstaff, AZ on April 15, 2015 completed a questionnaire about the causes of decay and behaviors related to decay prevention. Their children were screened for the prevalence and severity of dental caries. Parents were knowledgeable about some preventative measures (fluoride) but not others (dental sealants) and they were not knowledgeable about the first signs of tooth decay. There was a relationship between the parents/caregivers knowledge about oral health and their child's caries severity (p=0.035) and older children had more severe decay than younger children (p=0.013). Future educational programs need to emphasize the importance of preventative measures such as sealant placement to correspond with eruption patterns and how to recognize early signs of tooth decay.

Campana, Miriam
Amelia Krieg, Madison Kuyper, Morgan Louvier, Megan Nolan, Elora Palmer, Samantha Schommer, Emily Sulka, Rose Tarquini-Cassell, Allison Theisen, Patrick Warfel
Faculty mentor: Season Ellison

Afternoon, 2:00pm-4:00pm, Skydome HONORS Floor

Title: Tombstone, Arizona and the Myth of the Wild West
A class of eleven Honors students demonstrate the extensive research they completed during the Spring 2016 semester as they learned about the Western Myth and applied the myth to the actual town of Tombstone, Arizona. Not only will they share in-depth knowledge about early prospectors, miners, businessmen, prostitutes, gamblers, and gunfights, but they will also explore the physical and architectural layout the town as a whole through the interactive demonstration space. They will present a visual compilation of video and photo documentation from the students’ own trip to Tombstone, which provides a silent filmic element that encompasses their overall research experience. This exhibit will allow the students to share what they learned and will help to bust the myth that the Wild West was all gunslingers, cowboys, and outlaws! Finally, our walk through exhibit will encourage visitors to interact with the town of Tombstone, Arizona and the eleven Honors students who traveled there and highlight the significance of experiencing 'place' as a component of liberal arts research education.

Campbell, Brittneigh
Faculty mentor: Francis Smiley

Session II, 2:00pm-4:00pm, 54B

Title: Walking with No Footprints: The Grand Valley Dani
In this report, I analyze the material culture of the Grand Valley Dani, farmers in the New Guinea Highlands. The Dani people may help us comprehend the materials left behind by archaeologically similar societies lost in the ocean of history. In order to understand the archaeological correlates of the Dani people, I discuss the spiritual and material culture of the Dani. I entitled this project, Walking with No Footprints: The Grand Valley Dani because of the amazing lack of future possible archaeological evidence of the Dani people.

Campbell, Shara
Faculty mentor: Marie Baker-Ohler

Session I, 9:00am-11:00am, 87B

Title: The power of words: Mindful verbal communication
The following is a brief abstract on the communicative process of mindful communication. In this historical moment it has been found that verbal messages are miscommunicated at a steady rate. Because of this miscommunication it is important to be mindful of our spoken words, and how they may affect others. This paper aims to showcase the impact of language along with the social construction of identity in order to argue the need of mindful communication. This research focuses on language and the construction of identity and mindfulness. The commutitive approach highlights the way individuals interpret spoken words, and construct identity based off of socially constructed verbal communication. The idea of mindfulness in everyday communication is a stepping stone to create an awareness of words, and messages and how they affect our everyday conversations. The exploratory analysis adds to the foundation of mindfulness. Specifically, mindful verbal communication, adding the importance of this practice to create better social worlds.

Carballo, Berenice
Mackenzie Bryson, Kandis Beyer
Faculty mentor: Viktoria Tidikis

Session I, 9:00am-11:00am, 73B

Title: Creativity Levels and Their Association with GPA
This presentation analyzes and examines individuals’ creativity levels and their association with their grade point average (GPA). The authors researched the hypothesis evaluating whether there is a correlation between creativity levels and grade point average (GPA). It was predicted that individuals' with higher creativity levels, will have higher grade point averages. The study was conducted through a survey questionnaire amongst a random sample of college students and measured their creativity levels based on an established rubric.

Carlson, Jennifer
Katie Carpenter, Austin Dikeman, Melissa Sepulveda, Jenna Shoosmith, Brianna Sparks, Devon Swanson.
Faculty mentor: Season Ellison

Morning, 9:00am-10:00am, Skydome Stage B

Title: The Tao of Animal: Creative Expressions of Academic Ideas
Honors 294: Tao of the Animal is a seminar class that engages students in the study of the diversity of human communities and the relationships and interactions between the psychological, historical, social, and political components of human communities. The phrase 'Tao of Animal' essentially translates to 'the way of the animal.' The primary philosophy that underlines this particular project is animal phenomenology, which encourages humans to look at the world with from as many view points as possible and try to understand the perspectives of others from their own experience--in this case we attempt to understand the perspective of animals. The stories presented are based on a creative research project in which we chose an animal and wrote a fictional story that captures, as best as possible, the animal's perspective from it's own point of view. To do so we conducted in-depth research so that we
might understand that animal’s environment, physical capabilities, and learn how her senses may differ from our own, human, sensory experience. The research allowed us to generate empathy with the animal and understand her perspective so that we might best identify with this particular animal. The creative writing we share explores many aspects of phenomenology and ultimately taught us, as human-animals, to better understand both the concept of phenomenology and also the other animals with whom we share the earth.

Carney, Molly
Gillian Brailsford, Lydia Sheperd, Andi Embry
Faculty mentor: Ted Martinez

Session II, 2:00pm-4:00pm, 104B
Title: Medicine in Eastern, Western, and Endemic Tribes
This poster presentation examines the similarities and differences of medicine in different cultures, specifically focusing on the contrasts between western medicine, eastern medicine, and endemic indigenous medicine. The core of this poster presentation examines and demonstrates the differences across the three named medicinal practices. The three regions are chosen to be examined based upon developmental and cultural similarities. Although western medical culture has become widespread, and many countries have adopted the medicinal practices, focus will be on the practices which were endemic to eastern and tribal cultures. This comparison examines not just technical differences in the medicinal practices, but also reveals perspectives on health and wellness, due to medicine's deep roots in religion and beliefs, specifically in eastern and indigenous cultures.

Carr, Ian
David Lupton, Sara Pugsley, Scott Sprauer
Faculty mentor: Will Cordeiro

Afternoon, 1:15pm-2:00pm, Skydome Stage D
Title: Dystopian Stories: A Reading (1)
This reading will feature creative writing written by students in HON 294: Dystopias. Several students will read their original dystopian short stories and scripts.

Carver, Christine
Faculty mentor: Julene Boger

Afternoon, 2:00pm-4:00pm, Skydome FCB Tables
Title: Tastes from Around the World!
Students representing the School of Hotel and Restaurant Management present cheese, coffee, and teas from around the world! They will tell of their history and how they are made. If you are lucky you may be able to get a sample.

Carver, Stephanie - CANCELLED
Faculty mentor: Susanne Pyle, Sharon Cardenas

Session I, 9:00am-11:00am, 8D
Title: Inquiry Based Learning in Mathematics Classrooms
Most modern mathematics classes, in all grade levels, are taught directly. A teacher stands at the front of the classroom, lectures about a topic, then gives students practice problems to do for homework. This traditional method of teaching is based upon rote memorization and passive students listening and taking notes. After much research, studies have found that these traditional methods are not as beneficial for student comprehension of mathematical concepts. In light of these studies, educational professionals have taken leading pedagogy and learning theories, and incorporated inquiry based learning. Inquiry based learning allows students to explore a concept and gain intuition before learning rigorous definitions. From a young age, children absorb information by observing the world around them. Inquiry based learning allows students to observe concepts and make their own conclusions with the teacher as a facilitator. In theory, this method allows students to understand mathematics more deeply and have better retention of the materials because this is how they learn naturally. In this study, the inquiry based method of teaching has been applied to a lesson on the unit circle to a local high school classroom to determine if inquiry based learning does in fact provide better results on a unit circle post-test than traditional teaching methods.

Casares, Heather - CANCELLED
Faculty mentor: Nancy Riggs

Session I, 9:00am-11:00am, 12C
Title: Zircon Geochemistry of Bentonites within the Late Cretaceous Kaiparowits Formation in Southern Utah, USA
The Cordilleran continental arc began forming 250 million years ago above a subduction zone, when the Pacific plate sank underneath the Laurentian plate causing magmatism along the western margin of North America. The arc is currently exposed in eastern California and southern Nevada and was active between ~250 and 65 million years ago. The chronological and chemical records of the evolution of this arc through time are incomplete due to the arc not being fully uncovered, as well as some parts having been eroded. Some of the arc material was deposited in southern Utah ~77-74 million years ago by means of river transport and volcanic ash fall deposits (bentonites). This area is now known as the sedimentary Kaiparowits Formation. Zircons can be used to record the chemical evolution of magmatic arcs by their accumulation of trace elements over time. Analyzing the trace element geochemistry will help determine where the bentonites came from, and more importantly what part of the arc was active at the time of deposition. This will help refine the history and geochemistry of the Cordilleran arc.

Casasola, Dionisio
Faculty mentor: Marie Baker-Ohler

Session II, 2:00pm-4:00pm, 85D
Title: An Intercultural Communicative Balance
The continued increase in immigration to the United States presents an intercultural dilemma regarding the balance between a dominate mono-culture and an emerging poly-cultural society. The dominate culture in a mono-cultural society can often exhibit xenophobia, ethnocentrism, and a sense of superiority. By contrast, a poly-cultural society tends to disenfranchise the non-dominate culture and create an overall sense of polarization. Prior research presents cosmopolitanism as an ideal approach to
intercultural communication, but fails to address heritage (e.g., race, creed, religion, et cetera). In this approach to communication, both societies risk their resources and develop a third society: a society balanced between mono-culture and poly-culture. Despite the research, there remains a tendency to adhere to the dominate ideology. This paper expands upon prior cosmopolitan communication theories by transforming the old, rigid balance into a fluid approach and argues the advantage of diversified communication during cultural disorder (e.g., Ferguson, Missouri).

Casey, Tara
Faculty mentor: Julie Moreau

Session I, 9:00am-11:00am, 91B
Title: Affective Citizenship Under The Nation-State
I will be discussing the idea of 'citizenship' and sense of belonging within the realm of the nation-state through a critical intersectional analysis of both personal identity and the identity of which the state seeks to uphold. An unpacking of the use of emotions, feelings, and affect to manipulate and promote a sense of belonging as well as instilling nationalism within its 'citizens', while simultaneously pushing out bodies that are deemed undesirable representatives of the nation, will be established throughout this paper. I will aim to develop this critique with the aid of both affect and feminist theories.

Castaneda, Denise
Faculty mentor: Amber Nicole Pfannenstiel

Morning, 9:30am-10:30am, Skydome East Concourse - ADA section
Title: Playful Interaction on iFunny
No abstract submitted

Castillo, Rayna
Tyler Lietz, Erika Bert
Faculty mentor: Ted Martinez

Session II, 2:00pm-4:00pm, 104D
Title: The benefits of plant-based remedies and diets in religious groups and cultures
The purpose of this poster presentation is to examine the effects of natural and herbal remedies, essential oils, and diets, particularly within religious groups and cultures. As society shifts away from natural, plant-based diets, it also shifts away from natural cures and medicines. This movement within modern culture creates a reliance on modern medicine that may shadow other effective and natural remedies provided by plants. Examining these groups can show the results of this phenomenon. The Seventh Day Adventists, blue zone groups, and Hindus each focus on natural remedies and diets that provide insight to the health benefits of these methods.

Caughey, Sarah
Briseida Salas, Sayer Gaughan, Emilio Espinoza, Katelyn Treichel, Alexis Guerrero
Faculty mentor: Jamie Clem

Session II, 2:00pm-4:00pm, 99B
Title: Cable TV vs. Streaming Platform usage among college students
We will be presenting on the compare and contrast of the usage of cable tv and streaming platforms such as Netflix or Hulu among college students.

Centner, Heather
Carina Hall, Jason Sahl, Jim Schupp, Paul Keim, David Wagner
Faculty mentor: Carina Hall, David Wagner

Session I, 9:00am-11:00am, 31D
Title: Genotyping Yersinia pestis from North America using amplicon sequencing
Yersinia pestis, the causative agent of plague, is a gram negative bacterium responsible for the deaths of millions of people worldwide. Transferred via fleas on ship rats, plague came to North America from Hong Kong at the turn of the twentieth century. Since then, plague has established itself in native prairie dog and ground squirrel populations in the western half of the United States. As Y. pestis has spread throughout the U.S., it has developed mutations called single nucleotide polymorphisms (SNPs). These SNPs can be used to create a unique DNA fingerprint which can then be used to determine where plague was introduced into the U.S. and how it has spread to other areas of the country. In order to better understand this movement of plague, we whole genome sequenced a subset of Y. pestis DNAs from North America. The sequence data we obtained allowed us to identify 385 novel SNPs. In an effort to DNA fingerprint 820 other un-sequenced samples, we utilized a technique called amplicon sequencing. This cutting edge approach offers distinct advantages over more traditional SNP typing techniques. We were able to optimize the amplicon sequencing system to process a remarkably large subset of Y. pestis DNAs with unparalleled efficiency and cost-effectiveness. The data we will generate using the amplicon sequencing approach will allow us to create a more comprehensive Y. pestis phylogeny in a timely and cost-effective manner.

Chaffeur, Jenna
Amber Treadway, Jarrod Chaplin, Mackenzie Staires
Faculty mentor: Will Cordeiro

Morning, 9:00am-10:00am, Skydome Stage C
Title: When a Body Becomes Illegal
This Powerpoint presentation will explore indecent exposure laws--especially regarding breasts and nipples--and how they affect the transgender community. In our research into state laws against public exposure of breasts, there have been several cases where trans folk have been arrested due to the enforcement of the normative gender binary.

Chamberlain, Jessica
Faculty mentor: Stefanie Kunze

Session II, 2:00pm-4:00pm, 92A
Title: Interpreting and Enhancing Mental Health and Mental Health Services on For Native Americans
Mental health is not a one size fits all idea. Rather, the interpretation of mental health and what is needed as treatment can vary from group to group. The purpose of this research is to help inform
mental health providers of the differences in needs for Native Americans and why those needs may be there (i.e. because of differing beliefs regarding what is healthy). In most cases, mental health care seems to be ineffective for Native Americans because it does not take into account the importance of spirituality and/or tribal history. This research will look at what certain providers are doing right as well as that which is being done wrong.

**Chase, Sherry**  
Katrina Cuevas, Melanie Edmonds, Maegan Wong, Marissa Opatz  
**Faculty mentor:** Jay Sutliffe

**Session I, 9:00am-11:00am, 112A**  
**Title:** *Flagstaff High School FitKids*  
This program project is to increase nutrition knowledge and increase physical activity in high school students. Students at Flagstaff High School that will be participating in the program project are currently enrolled in a Dance Fit class. The Dance Fit class is instructed by a certified Fit Kids aide. With the Fit Kids aide's guidance the program's instruction will be based on nutrition and physical activity options.

**Chatelain, Caitlin**  
Samantha Witt  
**Faculty mentor:** Melissa Birkett, Lucas Klein

**Session II, 2:00pm-4:00pm, 128B**  
**Title:** *The Healing Tone: Does it Work?*  
The healing tone is supposed to calm the nerves in the body using a specific frequency. It is said that it is the harmonic frequency of nature and produces feelings of peace. We will be discussing how the healing tone is supposed to work, more specifically what it does to the body. We will also go into whether or not it actually does what it is supposed to do.

**Chatelain, Nicole**  
Haleigh Thomas, Brandi Badilla, Majed Aljarallah  
**Faculty mentor:** Tricia Moore

**Session I, 9:00am-11:00am, 109C**  
**Title:** *Treatment of Very Young Children by Oral Health Care Providers*  
Early childhood caries (ECC) is the most prevalent chronic disease among children today. In attempt to reduce ECC, in 2003 the American Academy of Pediatric Dentistry recommended a child's first dental visit be earlier to the age of one. The purpose of this study was to determine how prepared (comfortable, competent) and willing Northern Arizona oral health care providers are to treat children under the age of three. Thirty-one oral health care providers in Flagstaff, AZ responded to a questionnaire about their comfort and current behaviors related to the treatment of very young children. Pediatric dentists and dental hygienists agreed children should be seen by the age of one. Most dentists indicated that children should first be seen at the age of two. Dental hygienists were more willing and more comfortable treating children under the age of three than dentists. Pediatric dentists, who specialize in the treatment of children, were the most comfortable.
Chavez, Adrian  
**Faculty mentor:** Ryan Fitch  

**Session II, 2:00pm-4:00pm, 43A**  
**Title: Pros and Cons on Hydropower at Parker Dam**  
Dams can provide a lot of electricity to improve the livelihood to small and big communities or can even offer huge proportions to a state's electricity usage. Hydropower is known to be one of the easiest ways to produce electricity when looking at alternative ways of generating power. However, a lot of environmental problems occur downstream from the dams that are built. Such as decreasing oxygen levels that will make it difficult for fish and other water habitats to survive, disrupting the sediment flow for a healthy river and other natural resources. I am choosing to do this research on Parker Dam to analyze how much electricity the Dam provides to local communities as well as to others in the South West region of the country. I want to look more into who exactly is benefiting from this dam, how that energy is being transported and what alternative ways can be used for producing electricity to make the users nondependent on hydropower.

Chavez, Phillip  
**Faculty mentor:** Ryan Fitch  

**Session II, 2:00pm-4:00pm, 36C**  
**Title: Renewable Energy in the Developing World**  
This project focusses around the study of the prevalence and impact of the implementation of renewable energy sources in developing nations. This addresses the prominent problem of supplying a reliable energy source to the entirety of Earth's population. Availability of a quality energy source is a key building block for a developing nation aiming to spur positive development within its boarders. This paper will study countries like India, China, Costa Rica, and Kenya in order to find the costs and benefits these nations encountered through their exploration into renewable energy technology, and use this analysis in order to find the best possible implementation of renewable energy technology in a developing nation.

Chiakmakis, Allison  
Ashley Rabine  
**Faculty mentor:** Laura Blank, Katherine Watkins  

**Session I, 9:00am-11:00am, 118D**  
**Title: Nurse Driven Sepsis Protocol**  
The purpose of this research-based project was to determine if implementing the CURB65 pneumonia severity score in emergency department triage would be useful in decreasing mortality rates related to septic shock. Research has determined that immediate medical intervention is essential when caring for patients with sepsis, therefore implementing the severity score to determine level of illness could help patients receive more immediate care. The CURB65 score is determined by one point for each of the following: new confusion, urea >7 mmol/l, respiratory rate 30 breaths/min, SBP <90 mmHg or DBP 60 mmHg, age 65 years (Marwick et al., 2014). Research found that the CURB65 pneumonia severity score outperformed five other severity scores in regards to predicting 30-day mortality rates in
patients with sepsis; therefore we suggest implementation into emergency department triage settings (Marwick et al., 2014).

Chiaradia, Marco
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 36D

Title: end production of low denomination coins
This paper will argue that low denomination coins are often produced at a loss. There is little social or economic benefits from the penny. The poor and elderly will have little to no economic disadvantage as a result of rounding. The rounding of transactions will not constitute a tax but result in savings for business. There are several benefits from eliminating small denomination coins.

Choitz, Curtis
Michael Minicozzi, Alice Gibb
Faculty mentor: Alice Gibb, Michael Minicozzi

Session II, 2:00pm-4:00pm, 31C

Title: Do amphibious fishes jump farther than fully aquatic fishes?
Fishes are most notably known for being fully aquatic but many are able to produce effective overland movements through a behavior called a tail-flip jump. This same behavior is employed by some amphibious fishes that not only traverse the terrestrial realm but have large scale modifications to their respiratory and integumentary systems as well. We were interested in comparing the kinematics and jump distance between aquatic fish species to that of an amphibious one. We filmed four species of Cyprinodontiform fishes performing the tail-flip jump in high speed (600Hz); three aquatic species (Jordanella floridae, Gambusia affinis, and Poecilia mexicana) and one amphibious species, Kryptolebias marmoratus. We predicted that Kryptolebias would produce longer jumps (when normalized for size) than the aquatic species studied here. Specifically we thought Kryptolebias would produce faster takeoff velocities and more ideal (close to 45°) takeoff angles the variables that contribute to longer jumps. Though we tried to account for size in our measurements, the smaller individuals jumped farther than the larger individuals. This result appears to overshadow any effects that 'amphibiousness' may have on tail-flip jumping performance. Thus, we interpret this result as size contributes more to jumping performance than behavior or lifestyle. Our results also form a clear trend where smaller fishes are able to jump farther than their larger counterparts.

Christian, Sarah
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 37A

Title: Finding the Upper and Lower Bounds of Unemployment Masked by Incarceration
Incarceration leads to higher rates of unemployment, which can lead to higher rates of recidivism. When unemployment rates rise, so do incarceration rates, regardless of the crime rate. Two of the factors which are commonly linked to an increased likelihood of incarceration are unemployment and poverty. Because people who are in prison are not traditionally counted in the labor force, it is possible that the unemployment rate would have been higher had a portion of the current prison population
never been sent to jail. The goal of this project is to find an estimate of the smallest and largest potential increase in the unemployment rate had the current prison population never been sent to jail.

Christian, Sarah
Jessica Armijo, Tyler Monaccio, Boran Wang, Run Zhang
Faculty mentor: Xiaobing Zhao

Session II, 2:00pm-4:00pm, 37B
Title: Assessing the Externality Cost of Lead Ammunition
The purpose of this project is to identify the economic and environmental impact of lead ammunition. The CDC (2007) has found that the use of lead in ammunition is the second largest end-use after batteries. Contact with lead is likely to cause negative health and mental impacts on humans, and to disrupt the ecosystem. Humans come into contact with lead in the course of using ammunition by eating animals killed using lead ammunition, by handling lead ammunition, and by inhaling lead immediately after firing the gun. Animals come into contact with lead through lead ammunition by eating the remains of animals killed using lead ammunition, or if the lead seeps into the water table. The risks of health effects to humans from ammunition-derived lead can be severe. These include death, lower IQ, as well as hearing loss, cataracts, or damage to the immune, cardiovascular, or reproductive systems. Lower IQs directly impact the ability to learn, and reduced health has been linked to lower education outcomes. The overall effects on society and the environment from the use of lead-based ammunition are clearly an example of negative externalities. By accurately assessing the damage that lead ammunition causes to the environment as well as human health, a socially beneficial price can be assessed.

Cipolla, Courtney
Stefanie Meeder, Reylan Alfafara
Faculty mentor: Melissa Birkett, Lucas Klein

Session I, 9:00am-11:00am, 130C
Title: The Mozart Effect: The Power of Music
In essence, the theory of the myth being tested is the overall impact that music or sounds can have on the brain of an unborn fetus and their development, and whether the symptoms are displayed before or after birth. This can include their level of intelligence and various personality qualities that arise from the influence of musical contact during their fetal development. In that, the idea that music does have some related impact on an unborn children, specifically in the fetal brain development, no matter if it is displayed within the womb or whether or not these differences are made aware in the child's early stages of infancy or later on in their childhood.

Clanton, Marcus
Faculty mentor: Stefanie Kunze

Session II, 2:00pm-4:00pm, 92B
Title: Sacred Mountain For Sale: Reclaiming History
The San Francisco Peaks are part of the Native American culture. They bring life to Flagstaff, Arizona and sustain the economy. Does Flagstaff need to use reclaimed water to promote tourism? Should Native American beliefs be sacrificed for profit?

Clara, Daniella  
Faculty mentor: Julie Moreau  

Session II, 2:00pm-4:00pm, 88D  
Title: The Affective Outcomes of Within-Race Racism Among Hispanic Americans  
In current Western culture, dualistic thinking is commonly used, especially when it comes to race. However, racism is a culturally ingrained issue that exists in many different racial arenas. This paper will be considering the racism that exists within Hispanic and Latino/a cultures inside of the United States. Specifically, it will be exploring the current literature which looks into the importance that is placed on skin color and other characteristics that are seen as ‘desirable’ within these cultures. This paper will then explore and compare the affective state of shame that exists in both Hispanic people with darker skin and Hispanic people that are seen as ‘white-passing’ (in other words, those with largely White/ European characteristics).

Clarkson, Breann  
Faculty mentor: Christopher Jocks  

Session I, 9:00am-11:00am, 67C  
Title: Into the Looking Glass to better Understand Indigenous Methodology  
Indigenous research methodology are tribal knowledge basis, there is some correlation between western knowledge and research but there some distinct characteristics pertaining to indigenous research methodology. I will be researching and analyzing a study that was done on the White Mountain Apache tribal reservation and to evaluate the use of methodology employed in the specific research conducted.

Clayton, Nicholas  
  Courtney Hofacre, Jordynne Black  
  Faculty mentor: John Houser  

Session I, 9:00am-11:00am, 73C  
Title: Exercise and Reading Comprehension  
Our experiment looked at the effects of anaerobic and aerobic exercise on reading comprehension. Their were 3 groups one of which did wall sits, another did jumping jacks, and the last did not exercise. All groups had 4 minutes to complete a reading on garbage and take a 10 question exam after which we compared the scores to see if there was a difference between the scores of the groups and if so which groups had the highest scores.

Clor, Scott  
Faculty mentor: Nora Dunbar  

Session I, 9:00am-11:00am, 80D
**Title: A false perception, with a laugh**
An advertisement portraying a sexual stereotype will be shown to an even mixture of female and male subjects, they will be given a questionnaire which will be used to measure sexism and whether this will play a role in why genders view sexual based stereotypes differently.

**Club, NAU Clay**  
**Faculty mentor:** Jason Hess

**Morning, 9:00am-11:00am, Skydome CAL floor**  
**Title: Throwing Pottery**  
This will be a demonstration of how to create ceramics using a potter's wheel.

**Club, NAU Clay**  
**Faculty mentor:** Jason Hess

**Afternoon, 2:00pm-4:00pm, Skydome CAL floor**  
**Title: Throwing Pottery**  
This will be a demonstration of how to create ceramics using a potter's wheel.

**Colbert, Candace**  
**Faculty mentor:** T Mark Montoya

**Session II, 2:00pm-4:00pm, 92D**  
**Title: Politicizing Hip Hop**  
Hip Hop has been treated as mere entertainment and criticized for having sold its soul for commercial profits. But, scholars such as Watkins (2005) recognize the increasing relevance and use of Hip Hop to further political and social causes. Since its beginnings in the Bronx in the 1970's, Hip Hop has become the unfiltered voice of numerous marginalized communities and grassroots movements around the globe. This Poster will examine the use of Hip Hop in activism as a global phenomenon by looking at activist artists from Yemen to Brazil. This poster will look at Sofia Ashraf and her viral Nicky Minaj parody video that denounces the environmental damage created by big corporions in India. It will also explore the youth-oriented Grupo Cultural Afroreggae and its use of music to promote peace and end violence in Brazilian favelas. By looking at Sanasino Al Yemen, this poster will raise awareness about religious discrimination and prejudice, notably in light of recent terrorist attacks and the refugee crisis. Australian indigenous artist Jimblah and the ways that he brings attention to aboriginal issues and encourages empowerment through Hip Hop will also be presented. Ultimately, this poster will demonstrate that Hip Hop is a universal tool for social activism in marginalized communities around the world.

**Colby, Ashley**  
**Faculty mentor:** Will Cordeiro

**Session II, 2:00pm-4:00pm, 104A**  
**Title: Realistic Medical Emergencies in the Apocalypse**
For the honors symposium I want to present a poster board presentation on medical emergencies in apocalyptic and dystopian societies. However, I do not want my project to be similar to other basic survival guides, or common zombie first aid kits. Films and texts usually only talk about a few basic emergencies, such as bite marks, stab wounds, gun shot wounds, and amputations. But, I plan to present a realistic expectation of the most common daily medical emergencies, and if one will be able to survive them in certain dystopian societies. For example, heart attacks, low blood sugar, respiratory distress, allergic reactions, and strokes, happen to many individuals everyday and are likely to happen to high stressful situations, such as living in a dystopian society. A few of these emergencies would be almost impossible to survive from, however others may be managed in certain societies. Books, movies and TV shows never present these emergencies and I personally dislike unrealistic medical situations and treatments. I believe it would be enlightening to others, if I share a different and more realistic view on medicine in different dystopian societies.

**Colby, Courtney**  
Katherine Thomas, Eric Baskovich, Michael Lyles  
**Faculty mentor:** Fredrick Gooding, Jr.

**Session I, 9:00am-11:00am, 97B**  
**Title:** The GENIUS of Hip Hop  
Many believe that the rap videos they see on TV, which appear to glorify material acquisition and misogyny, are representative of Hip Hop. They are mistaken. Hip Hop comes from a tradition of marginalized black and brown poets from the inner city environments of New York, and has maintained its tradition of speaking out for those who are disaffected by shortcomings in our society. Hip Hop has not only provided a voice for such insightful expression, but has also offered inspiration for those wishing to improve their local and global communities. Hip Hop is a way of life, culture, and expression. It is complex, yet accessible. The cardinal components of Hip Hop are DJing, MCing, BBoy/ BGirling, Graffiti, and Knowledge of Self. The combination of these components produces the culture that is Hip Hop, and proves why it is truly GENIUS.

**Comeau, Morgan**  
**Faculty mentor:** Brandy Judson

**Session I, 9:00am-11:00am, 99C**  
**Title:** Behavioral Change  
This project was started for SW 310 class looking at behavioral change. The project aims to look at and adjust a behavior in my life that I would like to change. The goal is to identify a problem, why it occurs, how I plan/planned to work on it, and if it ended positively or negatively.

**Connair, Ian**  
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 54C**  
**Title:** Prehistory of Art Within Europe
The project showcases five distinct archaeological sites discovered within the continental boundaries of Europe. Each site displays a collection of historically remarkable artifacts that have helped researchers better understand early human behavior.

Cook, Nolen
Faculty mentor: Eric Yordy

Session II, 2:00pm-4:00pm, 35A
Title: Uber's Drivers: What Are They?
This research delves deeper into the highly debated question of what Uber's drivers' worker classification truly is. Looking into both independent contractors and employees, we focused on how Uber (a software company) uses its services to help everyday people become independently contracted drivers and how precedent from court rulings has questioned Uber's label of independent contractor for these workers. Moreover, we search if there is a more accurate label for these workers compared to just the two that are currently available by the IRS and other governmental institutions.

Cook, Ryan
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 37C
Title: Alternatives to the International Ivory Trade Ban to Conserve Elephant Populations
There has been an increase in demand for illegal elephant ivory and rhinoceros horn, and this has been accompanied by an increase in the illegal poaching of these animals that already have dwindling numbers. As what happens with any regulatory ban on a certain product, illegal activity increases and black markets arise in order to feed the rising demand. The international ban on the ivory trade needs to be lifted in order to preserve the populations of these animals from further poaching until extinction. Instead, the conservation of these animals should be put into the hands of markets that will be able to create a sustainable option to battling the demand for ivory and horn in Asia. It would allow professional veterinarians to carefully harvest the right amount from these animals to where they are not harmed and it can grow back. It would also decrease the amount of illegal activity associated with the black market. Additionally, not only would it be taking the money out of the hands of criminals that are harming the animals, but the money could be taxed and used to further conservation efforts for these animals.

Cooke, McKenna
Faculty mentor: Melissa Santana

Session I, 9:00am-11:00am, 49C
Title: Interior Design of a Salon for the Gender Neutral Society
For this project of designing a salon that caters to any being of society, a lot of research was required, whether it was in regards to male personality and opinions of hair and nail salons, or what types of toxic chemicals are used in hair and nail products that can harm the users of the space. Collecting and reading through all of this information is crucial in helping determine what the final design result will be for a successful salon that any gender may feel comfortable in. This project involved research, site
visits, interviews of salon professionals and other people of expertise, extensive schematics, and
design development using specific computer programs and hand-rendering techniques. A salon for
everyone would be ideal in today's society because people of all genders, experiences and behaviors
are growing acceptance and need somewhere they can see this for themselves.

Copp, Brennan
Peter Herron
Faculty mentor: Richard Hofstetter

Session I, 9:00am-11:00am, 17A
Title: Can Acoustic Vibrations Affect the Growth of Fungi?
Organisms create vibrations when moving, communicating or feeding. The mechanical energy from
these vibrations has been shown to affect the growth and behavior of neighboring organisms. For
instance, tree growth can be accelerated with low-intensity ultrasonic sound and plant pathogenic fungi
growth can be reduced in the presence of 5kHz sound waves, in one study. The purpose of this study
was to determine if combinations of two sound frequencies affect the growth pattern of a common
fungal pathogen of fruit and trees called Botrytis cinerea. We tested the hypothesis that 'fungal growth
is slowed by a particular combination of sound frequencies'. We tested fungal growth rates in the
presence of these combinations of frequencies: 110Hz, 110Hz/116.54Hz, 110/146.83Hz, 110/155.56Hz, 110/164.81Hz, 523.25/554.365Hz, 523.25/659.255Hz, 523.25/698.456Hz,
523.25/783.99Hz, 1046.5/1108.73Hz, 1046.5/1318.51Hz, 1046.5/1396.91Hz, 1046.5/1567.98Hz,
2093/2217.46Hz, 2093/2637.02Hz, 2093/2793.83Hz, and 2093/3135.96Hz. We grew the fungus on a
standard media in plastic petri dishes, and monitored their growth daily. We administered
sound/vibrations using tactile transducers connected to computers. Fungal growth rate was
significantly reduced by 110/164.81Hz, acoustic treatment and significantly increased by the
523.25/659.255Hz treatment relative to the no-sound treatments. Our results suggest that vibrations
can have a positive or negative effect on fungal growth depending upon the acoustic pitch (i.e.
frequency). Further studies are needed to test higher frequencies, which have been shown to be
negatively affect microbial growth.

Cormany, Alden
Faculty mentor: Zsuzsanna Gulasci

Afternoon, 2:00pm-2:15pm, Liberal Arts (Bldg #18) Room 120
Title: Shinto and Studio Ghibli: Japanese Traditional Religious Themes in Animated Film
This presentation will focus on the themes, rituals, symbols, morals, and stories inspired by Shinto, the
traditional religion of Japan, as illustrated in Hayao Miyazaki's(active 1963-present) animated films;

Cornell, Joyce
Rayanna Raftery, Joshua Totah
Faculty mentor: Rebecca Maniglia

Session II, 2:00pm-4:00pm, 103A
Title: Keeping it Real
The poster will focus on keeping it real in rap music and why it is and isn't important and it's links to criminality. The main influences on the music are the ties to the code of the streets and street culture. This topic is important because it is not a widely known or accepted in the general public. Bringing awareness will help educate and promote social change. Our goal with keeping it real is to impact the consumers and change the way that rap music is viewed, specifically as entertainment versus everyday life.

Corr, Colm
A Al Omairin, Mustafa Alkhabaz, Y E-Said
Faculty mentor: Kyle Winfree

Morning, 9:20am-9:45am, duBois Southwest Room

Title: The Rehabilitation BabyLift
Children with mobility issues experience developmental challenges due to their inability to explore their environment independently. Devices for children with mobility issues are either expensive or not commercially available, but child-size toy cars can be modified to provide mobility independence. The goal of the BabyLift is to integrate rehabilitative activity into the user's everyday routine. The BabyLift allows the participant complete lifting control and aims to encourage a desire to stand, stretch and explore. A frame was installed to the car to support the lifting mechanism, a joystick to control all motion and a linear actuator to perform the lifting. A Raspberry pi touch screen, a Raspberry pi and 3 Arduino's control the car's electronic function which will record continuous real-time data and help with customization. The modified car increases physical and cognitive development by making physical therapy fun and adaptable in the home. The BabyLift was tested and the participant had an enjoyable and positive experience. The collected data will increase the growing the body of evidence that child mobility and cognitive development can be addressed in tandem.

Corrington, Dillon
Jake Fleishman, Michael Robinson
Faculty mentor: Wilbert Odem

Afternoon, 3:30pm-3:55pm, duBois Marshall Room

Title: Clover Springs Riparian Restoration
Our project requires a topographic site survey, as well as a botanical survey of the existing conditions of the Clover Springs stream channel just outside of Flagstaff, Arizona. This project seeks to analyze the current state of the stream channel, and compare our findings to the original restoration that took place in 2001. In addition, to see if the channel held up over time and if it adhered to the original project goals. What we are doing is performing a site assessment, and are performing analyses on the current site to see from a design standpoint if there are any areas of concern that need to be taken care of with respects to channel incision, and sediment transport. Our goal is to restore the upstream section to its original condition, and to perform a riparian restoration to improve water quality, and to mitigate hydraulic energies with respects to sediment transport (erosion).

Cotherman, Jamee
Faculty mentor: Brandy Judson
Title: Behavior Change
My project is about a behavior change I am making that involves me cutting down on my internet use.

**Couch, Hannah**
**Faculty mentor:** Marie Baker-Ohler, Cindy Becker

Session I, 9:00am-11:00am, 87C
Title: What it Means to Live Happily Ever After
Disney movies have always told us that anything our heart desires will come true, but what Disney doesn't tell us is how we get there, or do they? Disney receives a bad reputation among from popular press and scholarly research because of the image it gives to today's youth. These claims consist of Disney giving youth false hope of how their life is supposed to be, unattainable body images and makes girls have a dependency on men to have a happily ever after. These kinds of claims and accusations have been made against Disney for years, and the harsh evaluations only get more in-depth with each movie. This work's purpose is to analyze the works of three different movies in order to prove that the claims against Disney are false. Disney movies teach today's youth communication ethics and how to live a healthy communicative life and this work will prove this by analyzing Mulan, Frozen and Beauty and the Beast. The three selected movies this works rhetorically examine not only prove the negative arguments against Disney as false; they also illuminate the metaphors of Hyde and are immersed in communicative lessons.

**Couture, Sheridan**
**Faculty mentor:** Stefanie Kunze

Session II, 2:00pm-4:00pm, 67C
Title: The Sacredness of the San Francisco Peaks
Arizona Snowbowl's announcement to use reclaimed water to make fake snow was met with quite an uproar from dozens of interest groups in surrounding communities. The debate became hugely controversial, especially among the thirteen Native American tribes that claim the San Francisco Peaks as sacred land. This project explores the claims of Native American tribes regarding this land use, along with the validity and legality of such claims.

**Cox, James**
Jason Dorsch
**Faculty mentor:** Jason Dorsch

Session I, 9:00am-11:00am, 112B
Title: Physiological Profiles & Sport Specific Training of Boxers
The case study was conducted to examine the physiological characteristics and cardiovascular adaptations of amateur boxers with sport-specific fitness training. Boxing is a combat sport that involves short bouts of high intensity physical activity. The sport demands the ability to sustain muscular power and endurance and ability to work above lactate threshold. Previously, studies on boxers has concentrated on body composition, muscle strength, aerobic capacity, and anaerobic power of Boxers (Singh et al., 2003; Ghosh et al., 1995; Khanna et al., 1992, 1995). Few studies have focused
on finding the most suitable strength and conditioning program for boxing. The primary goal of this study was to analyze the fitness adaptations and assess the usefulness of the strength and conditioning program. The fitness program aimed to increase activity tolerance above lactate threshold and increase muscular strength, power, and endurance. The case study showed promising physiological adaptations for the boxers. Increases in muscular strength, muscular power, and muscular endurance were observed. Furthermore, the boxers lowered their body fat percentage and overall bodyweight. Future research is needed to determine more suitable fitness programs for boxers which will achieve the goal of improving fitness categories of strength, power, and endurance while simultaneously helping them to drop overall bodyweight and body fat percentage.

Cravens, Natalie  
Faculty mentor: Jay Sutliffe

Session II, 2:00pm-4:00pm, 106B  
Title: The Effects of Social Media on Teen Drinking
Throughout this semester I have been planning, implementing, and evaluating an alcohol awareness program at Summit High School and have been specifically focusing on how social media affects teen drinking habits. I have administered a survey within a health class at Summit High School with student's ages ranging from 14 to 19 and have found the following results: about 77% of the surveyed population uses Facebook and about 54% of the population uses both Facebook and Snapchat. The population also commonly used Instagram and Twitter. About 38% of the population reported using social media daily and 31% reported using social media weekly. Additionally, 77% of this target population has ever consumed alcohol. The alcohol awareness program intends to address this problem of underage drinking at Summit High School, but my research will additionally focus on how social media affects underage drinking. I will be comparing the findings of my primary data to what I find in secondary data to report about this problem and come up with some kind of solution to it.

Creel, Courtney  
Faculty mentor: Glenn Edgerton

Session I, 9:00am-11:00am, 120C  
Title: Scapular Dyskinesis
Research on Scapular Dyskinesis. Scapular dyskinesis is the alteration in the static and dynamic positioning of the scapula on the thorax in all ages. Most commonly it is seen in high school to college aged athletes. During normal movement, the scapula is going to sit in a retracted and depressed position. During upward rotation, the inferior angle moves up and laterally; this is a combination of elevation, protraction and internal rotation of the scapula. The opposite is then preformed for downward rotation, the inferior angle moves inferior and medially. Abnormal biomechanics will include The scapular dyskinesis is coming from kyphotic posture, over tightness of chest wall, weakness of posterior and tightness of anterior muscles. Decreased scapular control can cause a loss in stability; a decreased velocity for throwing, and pain with any overhead movements. Altered mechanics can be dangerous to the athlete because it has the potential to cause different shoulder injuries. There are 4 different types of scapular dyskinesis. Type 1: On the Inferior-medial angle border there is a prominence. Type 2: The medial border prominence. Type 3: The superior border prominence. Type 4 being normal, scapula symmetry. Treatment is Conservative rehabilitation.
Crews, Cassidy
Alyssa Ortiz
Faculty mentor: Sarah Burcher, Kiisa Nishikawa

Session I, 9:00am-11:00am, 34D

Title: *Frog Compensation of Additional Weight through Backpacks*
In this study, we increased the weight of the frog species *Lithobates pipiens* by using an adjustable backpack made of felt and elastic to secure metal washers to be able to increase the weight of the frog in a controlled manner. The frogs completed several jumps with various percentages of total body weight ranging from 0% to 25%. Jumping mechanism, physical structure, and behavior were studied as we made predictions and analyzed the data. We predicted that the jumping mechanism would adjust to mimic that of a more massive *L. catesbianus* species, as *L. catesbeianus* scales isometrically with *L. pipiens* in terms of body mass and length. We believe that *L. pipiens* will attempt to compensate with its added mass, and at greater weights will mimic the less controlled form of landing of the larger species as power is increased. Overall, through multiple different trials of additional weight, the amphibians did not seem to significantly change their jumping behavior. It was found that the female *pipiens* with increased amounts of weight jumped significantly larger distances than male *pipiens* with increased weight.

Crinigan, Richard
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 54C

Title: *Animals in Prehistoric Art*
I plan to create a poster that focuses on the appearance of animals throughout prehistoric art.

Cross Lopez, William
Thomas Haden, Julian Herring, Samantha Kruse, Stephanie Hurst
Faculty mentor: Stephanie Hurst

Session I, 9:00am-11:00am, 23B

Title: *Heteroatom Polyaromatic Hydrocarbon Systems With Nitrogen Ligands: Reinventing the Sandwich*
Polyaromatic hydrocarbons (PAH's) are molecules that are made up of multiple benzene rings. PAH's are of interest because such molecules can interact to form stacked, column-like structures. These interactions can be utilized to form what are known as 'sandwich' complexes. These compounds are made up of two large PAH's bound to metal atom(s). Sandwich complexes are important in chemical synthesis as they can be used as catalysts and have other unique properties. I synthesized a series of 14-aryl-14H-dibenzo[a,j]xanthene (DBX) complexes. These compounds are of interest because the introduction of nitrogen and halogen substituents alter the geometry and the electrical properties of the molecule. Utilizing these compounds I then employed a novel synthetic approach that uses liquid bromine in benzene solution to form the cationic species DBX+. These cationic DBX+ compounds can undergo a further reaction to form the closed system giving rise to a series of BNCX compounds which can form sandwich complexes. These molecules were characterized using a variety of analytical
techniques. Such techniques measured the position of the different atoms in the molecule as well as the bond lengths and angles. The results showed how the differing substituents effected the overall properties of the molecule. Even small changes in the electrical and physical properties can have a profound effect on the ability of these molecules to stack and form sandwich complexes.

Crowe, Kendra  
Beth Diehl, Katelyn Peets, Kristina Gonzalez, Danielle Mori  
Faculty mentor: Jamie Clem

Session I, 9:00am-11:00am, 99D  
**Title: Relationships and Self-Esteem**  
The topic of our research project is Relationships and Self-Esteem. Our group decided to research this topic because we wanted to see what people's self-esteem is when they are single compared to when they are in a relationship. Our research consisted of surveying Undergraduate College Students. To get our data, we surveyed students that are in a relationship and students that are single. For our outcome, we wanted to find out if student's self-esteem were higher when they are in a relationship or lower. The same for single students as well. We also asked questions on self-esteem when it comes to physical appearance and how they felt about their personality.

Cutler, Brett  
Faculty mentor: Russell Benford, Nashelly Meneses

Afternoon, 3:30pm-3:50pm, Skydome Stage D  
**Title: Calcium and phosphorous distributions in the mineral layer of Atlantic tarpon scales**  
Otoliths are bones in the ears of fishes which grow in annular rings. The chemistry of these rings reflects surrounding water chemistry at the time of growth. Correlating chemistry with ring number allows inferences to be made about the chemical environments a fish lived in over its lifespan. But the collection of otoliths is destructive and inappropriate for species of conservation concern. Fish scales represent a non-lethal substitute to otoliths, but they are less inert and require more investigation before their utility can be validated. It is assumed calcium is homogenous in the calcified layer of fish scales and therefore useful as an internal standard for data collection. This research tested the assumption of homogeneity using energy dispersive x-ray linescans on the scales of Atlantic tarpon (Megalops atlanticus). Linescans were conducted on scale cross sections at 8, 30, 50, 70, and 92% of total scale length to determine relative abundance of calcium and phosphorous. No significant differences in the distributions of these chemicals existed, indicating that they are homogeneous within the scale. This suggests that calcium and phosphorous may be used as an internal standard and encourages use of scales as non-destructive substitutes for otoliths.

Daigle, Chad  
Faculty mentor: Christine Lemley

Session I, 9:00am-11:00am, 47A  
**Title: Ways To Communicate With Everyone**  
The project that I will be working on is about how I can communicate to different cultural groups that the use of reclaimed water to make snow at the ski resort Snowbowl is offensive to Native American
groups like the Navajo and Hopi nations because they consider the mountains sacred. The project will try and convince people to look at situations from a different group's perspective.

Dalsing, Ashton
Cassandra Mort, Rodrigo Bello
Faculty mentor: Viktoria Tidikis, Gregory Busath

Session I, 9:00am-11:00am, 73D
Title: Bullying and Friendships
This research project seeks to find how experiences of bullying in childhood affect the quality of friendships in college. Bullying, as noted by Jantzer, Hoover, and Narloch (2006) is repeated aggression that can be physical or non-physical. Research in this subject mainly focuses on how bullying effects children in areas such as grades or social ability. Although it is important to understand the effects bullying can have on children is an important topic, long lasting effects are just as important to research. For young adults, correlations between bullying in childhood include psychological adjustment issues and mental health issues (e.g., Sesar et al., 2012, Lereya et al., 2015, Goodboy, Martin, & Goldman, 2016). Previous research touches on many of the lasting effects that bullying can have into young adulthood. However, little research shows how bullying can influence friendships in college. Therefore, this study hopes to build upon the ways in which childhood trauma, specifically bullying, can have lasting effects into young adulthood and influence college experiences.

Dalton, Brooke
Tommy Rock, Jani Ingram
Faculty mentor: Jani Ingram

Session I, 9:00am-11:00am, 23A
Title: Uranium and Arsenic in Soil and Sediment from Cameron, AZ
Many uranium mining operations were conducted on Navajo Nation lands in the mid 1900s. Cameron, Arizona is a community that is surrounded by abandoned open pit uranium mines. The uranium mining, as well as the higher levels of arsenic found in the Northern Arizona region where Cameron is located, has led to health concerns for the community. This study aims to quantify the uranium and arsenic in the soil of the Cameron area, as well as determine if the concentrations of either uranium or arsenic are significantly impacted by depth. Soil was collected in summer 2015 from the Cameron area from a variety of different geographic features, including near mine waste piles, as well as sediment from ponds and a river. The soil was left for several days to dry, after which it was sifted and milled. Samples were then put into a furnace to remove organic matter, and will go through a process of acid digestion and be analyzed using Inductively Coupled Plasma - Mass Spectrometry (ICP-MS). This study is being conducted alongside analyses of other mediums including livestock and water for uranium and arsenic content in the hopes of creating a more complete overlook of possible contamination sources for the community.

Damiano, Katherine
Faculty mentor: Francis Smiley

Session II, 2:00pm-4:00pm, 66C
Title: The Mardudjara of Western Australia: The Material Culture of a Hunter-Gatherer Society
This research project displays a visual examination of the material correlates of the ethnographically known Mardudjara of Australia. By examining the Mardudjara and other living aboriginal societies, archaeologists can learn much about the culture and preservation potential of the material correlates. The Mardudjara are a nomadic society in which all created materials must be portable, easily manufactured, and lightweight. The Mardudjara are a hunter-gatherer society that primarily uses wood as a main source of material and reside in the arid deserts of western Australia. Although the Mardudjara create a variety of different tools, weapons, shields, and shelters, I predict that the preservation of the material correlates in the archaeological record will be restricted. This presentation will organize and model a variety of material cultural items and how they relate to the society and other cultural factors. The poster also provides comparisons between similar societies and the archaeological material correlates of the Mardudjara.

Daniels, Raquel
Taylor Leyva
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 88A
Title: The Impact of Exposure Therapy on Claustrophobia: A Systematic Review and Meta-Analysis
Recent psychotherapy trials have studied the efficacy of exposure therapy in the treatment of claustrophobia. This project seeks to conduct a systematic literature review and meta-analysis to evaluate the research evidence in an effort to quantify the effect of exposure therapy on symptoms of claustrophobia. To do so is important in clinical research because these two mediums are considered to be the strongest levels of evidence for efficacy of treatment. A systematic review collects data from a group of studies for a specific treatment. From here the data is coded and a meta-analysis is conducted to determine the effect size of this treatment. Method: The electronic databases PubMed and PsychINFO will be searched following the best practice standards, including PRISMA-P protocol for randomized controlled trials (RCTs) and non-randomized controlled trials (non-RCTs) in which exposure therapy was compared to a control condition. In the results section, the methodology and results of clinical trials that met inclusion criteria will be reviewed and summarized. For the meta-analysis, the effect size for each clinical trial will be calculated. Once this is completed, an overall effect size statistic will be calculated for all of the trials. These statistical analyses will be conducted using the statistical program, Comprehensive Meta-Analysis (CMA) software, Version 3. In the discussion section, key clinical trials will be highlighted and ideas for future research will be discussed.

Davis, Bailey
Faculty mentor: Amber Nicole Pfannenstiel

Morning, 10:30am-11:30am, Skydome East Concourse - ADA section
Title: Playfully Navigating the Internet
My presentation will focus on the video game Assassins Creed: Unity and how it relates to literacies and learning.
Davis, Joseph
Zachary Crimmins, Jace Elkins, Jordan Weyrauch
Faculty mentor: Stephanie Sarty, Edward Smaglik, Alarick Reiboldt, Mark Lamer

Afternoon, 1:40pm-2:05pm, duBois Marshall Room

Title: City of Flagstaff Traffic Signal Redesign
The roadway intersection located at N. Country Club Dr and E. Old Walnut Canyon Rd has different intersection geometry as other nearby intersections in Eastern Flagstaff, Arizona. E. Old Walnut Canyon Rd. is a two-way road with stop sign control at the intersection with N. Country Club Dr. N. Country Club Dr is an uncontrolled, multi-lane two-way road with heavier average daily traffic. The City of Flagstaff has identified N. Country Club Dr and E. Old Walnut Canyon Rd as an unsafe intersection that has the need to undergo an intersection re-design process. If the intersection does not undergo the redesign process, the intersection will continue experiencing a high collision rate, which could potentially cause economic and physical harm to intersection users. The final design report outlines the strategy that J3Z Engineering will use to redesign the intersection to improve overall safety. Within acceptable safety limits, J3Z Engineering will also optimize traffic efficiency. J3Z engineering will highlight design alternatives in the final report. To choose an appropriate intersection redesign, J3Z Engineering reviewed both traffic engineering industry guidelines and the City of Flagstaff’s standards and policies. Furthermore, J3Z Engineering, collected data on the current state of the intersection of N. Country Club Dr and E. Old Walnut Canyon Rd, and analyzed the data to assess the intersection's current conditions.

Davis, Zachary
Bradley Austin, Cameron Kownack, Daityevon McFadden
Faculty mentor: Dennis Foster

Session II, 2:00pm-4:00pm, 37D

Title: An Analysis on how to Eliminate the Federal Reserve System
In this project, we will be analyzing on the most effective way to eliminate the Federal Reserve. We will be examining the failures of the Federal Reserve system and discussing potential solutions. An example of a failure in the Federal Reserve system can be found within the Board of Governors only thinking of the economy in terms of the present and not the future. Problems include excess printing of U.S. currency and ineffective manipulation of interest rates. If changes are not eventually made to the Federal Reserve the economic outlook is ripe for inflation and other potentially catastrophic issues.

De La Riva, Brennan
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 38A
Title: The Effects of Oil Prices on the US Economy
This project goes over the current oil price levels and fluctuations in the economy. It reviews how the prices were caused and what to expect in the future. The analysis will go over expected prices and whether or not this will have a long-term negative or positive effect on the US economy.

Deibel, Jessi
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 54D

**Title: The Prehistory of Religion and Spirituality**
Honoring the dead is a practice of thousands of years. But the different rituals and burials has changed dramatically with each passing decade. Journey through time and space by viewing my poster and witness how ancient modern humans treated their dead and prepared them for the afterlife.

Deleon, Nicholas  
**Faculty mentor:** Amber Nicole Pfannenstiel

**Midday, 11:30am-12:30pm, Skydome East Concourse - ADA section**  
**Title: Playful Memes**  
No abstract submitted

DeShazo, Niki  
**Faculty mentor:** Will Cordeiro

**Afternoon, 2:00pm-3:00pm, Skydome Stage C**  
**Title: Goodbye Gravity and The Other Side: Two Novels-in-Progress**  
This Powerpoint presentation will summarize the dystopian novel that I am writing, Goodbye Gravity and its sequel The Other Side. The societal issues I highlight are child abuse, the lack of equality for women, domestic abuse of women, and depression/mental illness.

DeVar, Madelin  
Healey Marsch, Keragan Cavolo, Lauren Helbling  
**Faculty mentor:** Nora Dunbar

Session I, 9:00am-11:00am, 75A  
**Title: And The Final Rose Goes To...Who Is YOUR Ideal Mate?**  
The purpose of this project is to see if there are differences in physical and interpersonal mate preferences due to sex. Additionally, the current study's results will be compared to previous mate preference studies to analyze for generational differences. A mate preference questionnaire composed of physical and interpersonal characteristics (fidelity, dependability, vitality, spiritual values, creativity, attractiveness, good parenting, and status-wealth) in a mate for our participants to score on a scale of 0-6 (0 being irrelevant and 6 being indispensable) will be administered to PSY 302W students and additional males. We expect men to score physical attractiveness significantly different than women, and women to score status-wealth qualities significantly different than men. Our results should be consistent with previous studies' results. This shows that the Evolutionary Theory of Attraction is still relevant within this generation.

Diab, Camile  
James Etzkorn, Emma Collins, Dylan Lenzen  
**Faculty mentor:** Angie Moline, Taylor Joyal
Session I, 9:00am-11:00am, 18C

Title: The Real Food Challenge at Northern Arizona University
The Real Food Challenge is a student-run food transparency campaign. The primary objective of the Real Food Challenge campaign is to shift the $1 billion existing university food budgets away from industrial farms and junk food, toward more community based and sustainable sources by 2020. Real food is defined as food produced in a way that takes into consideration issues ranging from human rights to environmental sustainability. By organizing around universities, students have been able to help increase food transparency. Over 200 universities nationwide have signed onto the Real Food Challenge. As part of the NAU Sustainability Action Plan and Sodexo's Better Tomorrow (Sustainability) Commitment, the Real Food Challenge project worked to improve the university's Ecological Footprint. October 2014 and February 2015 Sodexo invoices for the on-campus dining location, The Hot Spot, were compared. Once these invoices were reviewed, research into the supply chain was conducted. By contacting vendors to confirm product location and sustainability practices it could be determined if products could be classified as 'real' (meaning from the ecological food system) through inputting collected data into the online calculator. This was used to determine how much 'real' food was purchased by the university. Using this information, Real Food Challenge members were able to create an action plan encouraging the purchasing of locally sourced, ecologically sustainable and humanely produced food. The action plan created is available for Sodexo to help further the goals set forth in both the NAU Sustainability Action Plan and Sodexo's Better Tomorrow (Sustainability) Commitment.

Dickerson, Emma
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 54D

Title: The Written System in the Middle East
Within this project I will be addressing the topic of the archaeology of the written system. I will be narrowing my topic down to how the written system progressed within the Middle East. In order to do this, I will be looking at many civilizations that have occupied the Middle East over time and how the written system has developed and progressed within these civilizations and how this correlates to the overall development of the written system in the Middle East. I will be displaying this project by creating a professional printed poster.

Dickinson, Christina
Faculty mentor: Melissa Santana, Margo Wheeler

Session II, 2:00pm-4:00pm, 49D

Title: The Importance of Good Design in Affordable Housing
Before affordable housing can be built, public policy and funding sources must be in place that allow government and private entities to build structures that meet the basic needs of their inhabitants. Once policies are in place, many organizations work with architects to create structures that fit on the land available and interact with the other structures in the neighborhood. The interiors of the spaces are often built simply to fit within the given footprint without much thought to how the space will be used or the furniture that may be placed inside. Why does the interior of affordable housing matter?
How can interiors be approached in a new way that can meet the needs of the residents while remaining affordable to builders?

Diehl, Beth
Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 100B
Title: Behavior Change in Sleeping Habits
The concept that I am addressing is that of college students, specifically myself, obtaining a proper amount of sleep every night. For my project I am seeking to be asleep by midnight every night. Due to the timing of my class schedules, if I am asleep by midnight, then I will have had the proper 8 hours of sleep as is suggested by doctors and cognitive psychologists. I have made a list of small behaviors that I can change in order to adjust my habits so that I am reaching this sleep goal. I have constructed a chart to judge whether or not my goals have been met so that I can track my progress. Historically college students are known for not getting enough sleep. Comparatively we know that a sufficient amount of sleep is required for full cognitive functioning. Knowing this phenomenon I seek to remove myself from the statistic and actually get enough sleep so that I may reach my peak success in my education.

Diehl, Sophie
Faculty mentor: Stefanie Kunze

Session I, 9:00am-11:00am, 67D
Title: Gaming and the Seminole Tribe of Florida
This project will focus on the Seminole Tribe of Florida and gaming on their reservation. It will first describe the Seminole Tribe, looking at its history and culture. It will then focus on gaming generally with Native American Tribes, the legal situation, history and culture. It will then tie these two things together and look at gaming of the Seminole Tribe, the purchase of the Hard Rock Cafe Casino, the court case Seminole Tribe vs. Florida, the history of gaming for the Seminole Tribe, the gaming contract between Florida and the Tribe and the general legal situation.

Diehl, Tessa
Jensen Grief
Faculty mentor: Will Cordeiro

Afternoon, 2:00pm-3:00pm, Skydome Stage C
Title: Turn Your Dystopia into a Utopia: An Infomercial
This video will offer a satiric take on utopian thinking and include a brief presentation and discussion afterward. It will be in the form of an infomercial that offers various dystopian packages, using texts, video, and popular cultural references to satirize zombie apocalypses, disease, technology, and political dictators, among other scenarios.

Diggs, Shellee
Faculty mentor: Marie Baker-Ohler
Session II, 2:00pm-4:00pm, 83A

**Title: Identifying the social semiotics of meals: What is communicated around the table?**

Communication scholar John Stewart, notes ‘In every conversation you're not only expressing your ideas but also defining who you are.’ Communication is the means by which people verbally and non-verbally construct their identity in relationships, groups, and within their culture. This project elucidates the semiotic conversations that occur during a shared meal. The discursive practice of food as a social semiotic resource is recognized in the field of anthropology as an important additive to the study of human cultures, however in depth examinations of this phenomenon by communication scholars, is at this time limited. By analyzing the semiotic communicative aspects of commensality, scholars can identify additional channels through which people negotiate their identity and recognize the emotional, social, and cultural meanings of mealtime practices. This project uses the critically acclaimed HBO series The Sopranos to illustrate social semiotic messages that are communicatively transacted during meals such as power and love. These examples also provide a practical understanding of orientations in which people in families or groups innately use commensality to construct identity, remain connected to culture, and perpetuate traditions. Recognizing messages coded during commensality, and adding them to a conversation continuum can increase the breadth and depth in understanding of both interpersonal and group communication thus assisting in more apt identity construction.

**Dikeman, Austin**

Daniel Sanchez, Viacheslav Fofanov, Faith Walker, Colin Sobek, Carol Chambers

**Faculty mentor:** Faith Walker, Carol Chambers, Daniel Sanchez, Viacheslav Fofanov, Colin Sobek

Session II, 2:00pm-4:00pm, 16D

**Title: Jumping into jumping mouse genomics: determining diet of an endangered species**

The New Mexico meadow jumping mouse (Zapus hudsonius luteus) is an endangered species obligate to riparian areas in the southwestern United States. Little information is available about the diet of this species, which is important knowledge for directing conservation efforts. Metagenomic analysis of fecal samples collected from nine jumping mice captured in summer 2015 revealed two plant genera (Stellaria and Mertensia) and six families of flowering plants as likely diet items. Not detected by genomic analysis were rushes and sedges (Carex and Juncus), which were abundant at multiple sites where jumping mice were observed and captured, and are thought to provide important habitat structure. To validate presence of herbaceous diet items and determine whether rushes and sedges were also eaten, we designed a genetic multiplex assay targeting Stellaria, Mertensia, Carex, Juncus, and all flowering plants, with the goal of testing feces from 20 jumping mice. We will determine whether: 1) our target genera are consistent diet items across sites and individuals; 2) rushes and sedges are important for diet as well as habitat structure; and, 3) mice consume other local plant items, which could be identified further using high-throughput sequencing methods. This research will promote conservation on federal and private lands and guide management decisions for the species.

**Dixon, Erik**

Cameron Gaskin, Austin Abhari, Harrison Lambeth

**Faculty mentor:** Ryan Middleton
Session I, 9:00am-11:00am, 5A

Title: Measuring Accentedness

The client is developing a system to detect the degree of accentedness in speech, or the extent to which speech differs from its native speaker norm. The client's system splits an audio file down into the basic utterances of English language, or phones. However, it isn't the phone recognition that makes this model unique. Using these phones, speech rate, prosody, intonation, and stress will be calculated and used to more accurately measure the accentedness of the speaker in the audio file being evaluated. It is the developer's job to create a program, whether it uses Hidden Markov Models, or Neural Networks, to identify phones with 80% or more accuracy in a Windows environment. Once this element of the new speech evaluation system is complete, development can continue towards recognizing prosody, intonation, and stress, properties only detectable with phones. Hopefully, the completed speech evaluation system will produce more accurate results than other systems for evaluating accentedness.

Dixon, Erik

Cameron Gaskin, Austin Abhari, Harrison Lambeth

Faculty mentor: Ryan Middleton

Afternoon, 2:05pm-2:30pm, duBois Meadows Room

Title: Measuring Accentedness

The client is developing a system to detect the degree of accentedness in speech, or the extent to which speech differs from its native speaker norm. The client's system splits an audio file down into the basic utterances of English language, or phones. However, it isn't the phone recognition that makes this model unique. Using these phones, speech rate, prosody, intonation, and stress will be calculated and used to more accurately measure the accentedness of the speaker in the audio file being evaluated. It is the developer's job to create a program, whether it uses Hidden Markov Models, or Neural Networks, to identify phones with 80% or more accuracy in a Windows environment. Once this element of the new speech evaluation system is complete, development can continue towards recognizing prosody, intonation, and stress, properties only detectable with phones. Hopefully, the completed speech evaluation system will produce more accurate results than other systems for evaluating accentedness.

Dominguez Mateo, Silvia

Faculty mentor: Christine Lemley, Gerald Wood

Morning, 10:00am-10:25am, Skydome Roundtable R2

Title: Two eye seeing, embracing Indigenous and Western knowledge in the Early Childhood curriculum

This project provides an Early Childhood curriculum for all students grounded in Dine and Western knowledge. The progress to include this knowledge is based on the Two eye seeing perspective, which embraces Western and Indigenous knowledge, in order to recognize both as valuable to contribute to the communal enrichment. Through Critical Indigenous Research Methodologies, the project posits why this knowledge inclusion in the curriculum has a positive impact in Indigenous and non-Indigenous students' education. Finally, the classroom application is addressed, rethinking the pedagogy and providing lesson plans to support teachers throughout this process.
Douglas, Tyler  
**Faculty mentor:** Ryan Fitch

**Session II, 2:00pm-4:00pm, 38B**

**Title: An Analysis of the Accuracy of the GDP Measurement**

In the early to mid-1930s Simon Kuznets and Sir Richard Stone developed the Gross Domestic Product (GDP) measurement in response to the Great Depression as a way to gain insight into how the economy of a nation was performing. Since then, the GDP has been used as tool to evaluate the well-being and progress of a nation. As economies evolve, there are critics who argue that the ways in which economies are measured should evolve as well. This analysis explores alternative methods and indices in comparison to the GDP for measuring the progression of select nations. The research shows that the GDP measurement is an unreliable method of illustrating well-being and progress and that a new method must be adopted in order to more accurately assess a nation.

Doyle, Celine  
**Faculty mentor:** Francis Smiley

**Session I, 9:00am-11:00am, 57B**

**Title: Black Mesa Analysis**

The Black Mesa Archaeological Project ran for almost two decades in north eastern Arizona. This project helped to identify sacred sites and document finds in the area. Because of the massive extent of this project, a great deal of work needs to be done in a variety of topics. This project will tackle these research questions. Through Geographic Information Systems, I will analyze data to gain a better and clearer understanding of this large archaeological site.

Doyle, Celine  
Siobhan Doyle, Rayla Maier  
**Faculty mentor:** Frederick Lampe

**Session II, 2:00pm-4:00pm, 57B**

**Title: Homelessness in a Mountain Town**

This project will focus on the homeless female population of Flagstaff and what resources they have, those they do not have, and how people (NAU students in particular) can help. This project also seeks to use an anthropological perspective to assist in solving these problems through community engagement and university participation. Women face a unique set of problems and struggles which can be somewhat alleviated through the course of this work. The needs of women experiencing homelessness are often complex and require an insider's perspective to understand. This team volunteered with charitable organizations and used participant observation to identify problems and needs within the community, most notably at Hope Cottage, a Christian-run center devoted to helping displaced women of many circumstances. These problems were analyzed and solutions devised. Solutions were found in community and university involvement and through the cooperation of local groups and businesses. This project is an example of how applied anthropology can work within a community and instigate change.

Doyle, Siobhan
Faculty mentor: Francis Smiley

Session I, 9:00am-11:00am, 57A
Title: An Analysis of Black Mesa
This project will use the program ArcGIS to assess and analyze a set of archaeological data from Black Mesa.

Drake, Jessica
Faculty mentor: Melissa Santana, Ann Collier

Session I, 9:00am-11:00am, 50A
Title: The Orchard - A Holistic PTSD Rehabilitation Center for Veterans
The Orchard is a holistic retreat to help Veterans reshape their lifestyle and outlook on life in a wholesome, healing environment. This rehabilitation center focuses on mental and emotional healing offering natural treatments and care as well as physical therapy to maintain their physical health. This center is aimed towards patients who have been home from service for a long while and have already received medical treatments to help them relearn daily living patterns. At the Orchard, patients will learn how to physically and nutritionally take care of themselves during a 40 day program with the help of diverse specialists, teachers, and social work case managers assigned to each patient. The Orchard offers a variety of spaces, wide range of social classes and advisory assistance appealing to both men and women Veterans so that every patient feels needed and attended to. Yoga, wood-shop, art classes and more will be offered and integrated into patients' daily schedules. The Orchard will provide empowering, restorative and comforting healing for men and women Veterans of ages 18 and up struggling with PTSD. Through organic architectural shapes, day-lighting, foliage, and community lounge spaces, the center is aimed to make patients feel at home and comfortable at all times while giving them the opportunity to interact with both private and public spaces. Overall, The Orchard promotes belonging, social support, and independence for Veterans in order to help them regain their life back.

Duffy, Rachel
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 57A
Title: Archaeology of Weapons and Warfare in Southern Europe
This presentation will discuss the archaeology of weapons and warfare in Southern Europe through the use of many examples from different time periods and archaeological sites throughout this region.

Dunst, Kelsey
Sara Tilford, Sedona Spann
Faculty mentor: Kendra Petersen

Session II, 2:00pm-4:00pm, 18B
Title: CHEFS Garden Program Consulting Project
Our Senior Capstone consulting project this semester involves working with Kendra Petersen and her CHEFS program. The CHEFS program seeks to provide sustainable and nutritious food for NAU
Campus Dining through the establishment of an onsite garden. In addition the program will focus on community outreach with relevant and interested organizations in the Flagstaff community in order to secure donations of volunteer time and garden materials. As a consulting team we will create and develop education programs for garden volunteers. In addition, we will create a garden volunteer training manual. We will also develop a volunteer scheduling system with built in commitment devices as well as a framework for data collection tracking measurable outcomes of success. Limitations for execution of these goals may include receiving timely responses from other parties involved with the development of the garden program. In addition, we are limited by the amount of time allotted for the completion of our work with the CHEFS program, given the relatively short timeframe for the project. Throughout the semester we will be focused on a broad range of projects in order to effectively aid the success of the CHEFS program. Through our collaboration with Kendra, as well as the greater Flagstaff community, it is our hope that we will provide the tools and framework to empower garden volunteers, NAU students, and the Flagstaff community to live a more sustainable lifestyle starting with nutrition.

Durant, Lauren
Lindsey Denny, Brooke Lewis, Daniel Wong
Faculty mentor: Gerald Wood

Afternoon, 2:30pm-2:55pm, Skydome Roundtable R2
Title: The Impact of Literacy on Academic Achievement
The purpose of this research is to establish a definitive link between a strong foundation in literacy, and student success. Through our research, we found substantial evidence that children who are confident and successful in literature will also succeed in other areas. We believe that in order for students to accomplish higher test scores and a deeper understanding in all content areas, they must first have a solid foundation of literacy. By reading and researching peer reviewed journals and test score data, we looked for a connection between these two factors. During a time in education when an emphasis is heavily placed on high stakes testing and their implication of success for both students and teachers, it is arguable that there are far more effective ways of teaching our children and preparing them to be productive members of society than 'teaching to the test'. Is it possible that the promotion of an enjoyment of learning -specifically through the establishment and use of libraries- could be more effective? This project will explore the idea that the promotion of literacy and libraries in schools is an effective way of improving academic performance and equipping students for future success.

Dustrud, Shyanne
Faculty mentor: Mark Hawthorne

Session II, 2:00pm-4:00pm, 11B
Title: Kinetics of Phase Formation and Microstructure Development of High Purity Silicon Nitride Ceramics
The primary focus of this project is to study the kinetics of phase formation and microstructure formation of silicon nitride in the regime of relative high purity silicon nitride. The vehicle in which this was done was through ATC Materials' Reduced-density Injection-moldable Pressureless-sintered Silicon-nitride (RIPS). Silicon nitride is a strong ceramic with low permittivity and high temperature strength and toughness. Silicon nitride has a unique microstructure that enables its high toughness and
Higher purity silicon nitride is well suited for applications such as high temperature radome and antenna windows in addition to propulsion components and thermal protection. Research focused on how processing parameters affect the final microstructure and crystal structure of the ceramic. The identification and quantification of phases was studied using X-Ray Diffraction (XRD) and Scanning Electron Microscopy (SEM).

**Dyer, Annie**  
Tad Theimer  
**Faculty mentor:** Tad Theimer

**Session II, 2:00pm-4:00pm, 107B**  
**Title: The Influence of Hands-on Engagement on Conservation Efforts**  
The research project observed how hands-on interaction with a wildlife conservation facility affected a person's willingness to support that facility. This was done by distributing a brief questionnaire to participants at the beginning and the conclusion of the Australian Environment, Wildlife and Conservation study abroad course of Summer 2015. The hypothesis was that participating in this hands-on study abroad course would change a person's willingness to support the conservation facilities visited over the duration of the course. Responses to the questionnaire were different at the conclusion of the course showing support for the hypothesis. This information could be used to promote engaging and informative hands-on programs for wildlife conservation facilities.

**Eberle, Jeffrey**  
Lauren Adoram-Kershner, Jason Vizcaino, Kellan Rothfus  
**Faculty mentor:** Michael Shafer

**Session II, 2:00pm-4:00pm, 2C**  
**Title: Wildlife Telemetry Drone**  
The purpose of this project was to design and manufacture a quadcopter drone to aid in the research of bat migration in the Coconino Forest. Currently, the bats are tracked using very high frequency (VHF) radio tags, which require researchers to hike up mountains to optimize signal between the VHF tags and the handheld antennas. Once a signal is received, the direction is determined and the researchers hike separate sections of the mountain to triangulate the roost location. The drone's purpose is to carry the antenna and, in conjunction with a receiver, determine the direction of a signal to triangulate roosting locations of the bats. The senior capstone team for Spring 2016 was specifically tasked with designing the frame for this drone. The frame itself needed to be collapsible to allow for easy transport, durable to sustain hard landings, and lightweight to optimize the thrust to weight ratio. Additionally, the battery and all wires needed to be concealed to minimize fire hazard. This drone will significantly reduce the physical and temporal requirements of the research teams and will be available as open source file downloads for those interested.

**Eberle, Jeffrey**  
**Faculty mentor:** Heidi Feigenbaum, Constantin Ciocanel

**Session II, 2:00pm-4:00pm, 2D**  
**Title: 3D Model Verification of Magnetic Shape Memory Alloys**
A mathematical model was created to predict the behavior of a nickel-manganese-gallium Magnetic Shape Memory Alloys (MSMA) in the presence of three-dimensional loading. MSMAs experience induced strain in the presence of a magnetic field and the particular material tested experienced up to 6% elongation. This strain is due to the atomic cells within the material reorienting to align with the external magnetic field. Potential uses of MSMAs include fine-scale actuation and energy harvesting capabilities but a more accurate model predicting the material’s behavior is needed. Two sets of tests were conducted to validate the current model; constant axial and lateral stress with varying lateral field, and constant lateral stress and field with varying axial stress. Both tests were conducted in a 0 degree and 90 degree orientation with lateral loads of 0, 0.5, 1.0, 1.5, and 2.0 MPa. In all cases, the model predicted the general behavior of the material but partial reorientation was experienced above 1.0 MPa lateral stress which is not currently predicted by the model. Future testing will be needed to more accurately model the behavior of the material as well as capture the reorientation experienced above 1.0 MPa lateral stress.

Eberle, Jeffrey
Lauren Adoram-Kershner, Jason Vizcaino, Kellan Rothfus
Faculty mentor: Michael Shafer

Morning, 8:55am-9:20am, duBois Fremont Room

Title: Wildlife Telemetry Drone

The purpose of this project was to design and manufacture a quadcopter drone to aid in the research of bat migration in the Coconino Forest. Currently, the bats are tracked using very high frequency (VHF) radio tags, which require researchers to hike up mountains to optimize signal between the VHF tags and the handheld antennas. Once a signal is received, the direction is determined and the researchers hike separate sections of the mountain to triangulate the roost location. The drone’s purpose is to carry the antenna and, in conjunction with a receiver, determine the direction of a signal to triangulate roosting locations of the bats. The senior capstone team for Spring 2016 was specifically tasked with designing the frame for this drone. The frame itself needed to be collapsible to allow for easy transport, durable to sustain hard landings, and lightweight to optimize the thrust to weight ratio. Additionally, the battery and all wires needed to be concealed to minimize fire hazard. This drone will significantly reduce the physical and temporal requirements of the research teams and will be available as open source file downloads for those interested.

Edgar, Montana
Hunter Davisson, Severiano Hernandez, Graham Langley
Faculty mentor: Lisa Tichavsky

Session I, 9:00am-11:00am, 103B

Title: Alcohol, Aggression and Self-Control, Do You Have What it Takes?
The purpose of this study is to investigate the relationship between alcohol consumption and aggressive behavior on the individual level. There have been many studies that address self-control and aggression or self-control and alcohol consumption but this study would like to find the connection between alcohol and aggression due to past history of aggressive behavior. We are comparing whether alcohol consumption or the level of self-control have more of an effect on aggressive behavior. Methods: We surveyed 100 students at a southwestern university using the
Grasmick et al original 23-point scale asking about aggressive behavior, alcohol consumption and self-control (Grasmick, Tittle, & Ward, 1993). We utilize OLS regression to test the effects of alcohol and self-control on aggressive behavior. Results and discussion will be forthcoming.

Eich, Emile
Julia Gardiner, Graham Whitney
Faculty mentor: Ted Martinez

Session II, 2:00pm-4:00pm, 105A

Title: Psychoactive Plants
This poster presentation examines the health benefits, misconceptions, and culture associated with psychoactive plants. Psychoactive plants are generally regarded as a drug like any other, though they should not fall under the same classification. The general public needs to be more informed regarding the effects of psychoactive plants. Not only are some psychoactive plants thought to open one's eyes and change his/her view of the world, but they can even be used to treat disorders such as PTSD, OCD, depression, anxiety, and addiction to other drugs. Over time, the role of psychoactive plants in American culture has developed a negative stigma that does not accurately represent the benefits it has offered in reality.

Einck, Tyler
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 56B

Title: The Archeology of Weaponry
Throughout history, different civilizations implemented unique methods of hunting prey, such as trapping animals, and more commonly, using spears and other equipment to hunt and kill. Depending on region and demographic of species available, hunter/gatherers would adapt to their surroundings based on these factors. This project will explore the evolution of different types of weaponry used by several different civilizations across time and across different geographical locations.

Eldredge, Landon
Faculty mentor: Neil Cobb, Lindsie McCabe

Session I, 9:00am-11:00am, 31B

Title: Rare Plant Importance to Pollinator Species Richness
The protection of rare plant species promotes biodiversity and helps to keep at risk ecosystems intact. I analyzed the importance of rare plant species and bee species diversity. Eight of the plant species on the area of study are respected for their rarity but also play a unique role in the foraging material of bees in the area. In Pine Hill Preserve, CA, I hand collected bees from common and rare plants to gather preliminary data on bee associations. Rare plants showed a significantly higher bee species richness than that of the common plants. Based on this data, rare plants serve support a more diverse bee pollinator community than do common plants. Rare plants in this study show to be a key support of the overall flowering plants. This study supports the idea of rare plants as a possible umbrella species for the surrounding area.
Elzer, Hannah  
**Faculty mentor:** Stefanie Kunze  

**Session II, 2:00pm-4:00pm, 67D**  
**Title:** *Snowbowl Ski Resort versus Native American Tribes*  
My project explores how Snowbowl Ski resort has violated the religious freedoms of thirteen Native American tribes by using waste water to make snow on a mountain held sacred to the tribes. It also examines the biological impact of the contaminants in the waste water on the wildlife and plants used by the tribes, as well as the cultural and religious implications of Snowbowl's actions. It examines actions that have been taken or have not been taken, as well as an argument as to why Snowbowl needs to change their ways.

Enriquez, Desirae  
Joseph Remy, Jr., Keely Miller, Ben Davis  
**Faculty mentor:** Will Cordeiro  

**Morning, 10:00am-11:00am, Skydome Stage B**  
**Title:** *The Craft of Fiction, 1*  
In this presentation, select students from HON 291: Craft of Fiction will present a reading of short stories they've written.

Erdman, Spencer  
**Faculty mentor:** Spencer Erdman, Denise Johnson  

**Session II, 2:00pm-4:00pm, 73A**  
**Title:** *A Systematic Review of the Efficacy of Dialectical Behavior Therapy for Individuals Afflicted with Borderline Personality*  
The efficacy of Dialectical Behavior Therapy for Borderline Personality Disorder has been examined in recent psychotherapy clinical trials. The purpose of the current project is to conduct a systematic literature review and a quantitative-meta-analysis to evaluate the research evidence to quantify the effects of Dialectical Behavior Therapy on symptoms of Borderline Personality Disorder. A meta-analysis is a systematic aggregative evaluation of related studies and psychotherapies that aims to deliberate and streamline informative relations outside the conventional norms of publication. Method: Electronic databases PsychINFO and PubMed will be searched consistent with best practice standards in which Dialectical Behavior Therapy was compared to control conditions. Results: methodology and results of locating clinical trials that meet inclusion criteria will be reviewed and summarized. For the meta-analysis, the effect size for each clinical trial will be calculated. Then, an overall success statistic will be calculated for all of the trials. The statistical analysis is will be conducted using the statistical program, Comprehensive Meta-analysis (CMA) software, Version 3. Conclusion: key findings of the systematic review and analysis will be summarized, strengths and limitations of the published clinical trials will be noted, and suggestions for future research will be offered.

Erwin, Brittany  
**Faculty mentor:** Norah Andrews
Morning, 10:00am-11:00am, Skydome Stage A

Title: Masking Insurrection: Satirical Clothing Descriptions in Eighteenth Century Lima

This project analyzes the use of exaggeration, especially in reference to physical appearance, in Don Esteban de Terralla y Landa's El Sol y el medio dia, published in 1790 in Lima, Peru. In this book, the author purports to recount the festivities that took place in the loyal city of Lima to celebrate the coronation of Carlos IV of Spain. Such documents were fairly common during this time period throughout the Spanish empire and the mother country herself, often serving as reassurances of imperial stability. De Terralla y Landa's work, therefore, does not appear out of place. However, a careful examination of historical context, in combination with word choice and style, reveals the satirical nature of this book. The author builds on contemporary perceptions of indigenous peoples as primitive and essentially harmless in order to ridicule the Spanish colonial authorities' ignorance toward the reality in the late-eighteenth century of impending revolution. My paper illustrates the contrast between the written record of intensifying resistance in the Andes and its utter lack of acknowledgement in this book. Fundamentally, I argue that the author was well aware of established practices of inferring political meaning from colonists' outward appearance. I explain how he used an exaggerated version of that very practice to undermine superficial perceptions of indigenous loyalty and the overall stability of colonial society.

Escamilla Guardiola, Nicole
Sabrina Leal, Ali Parks
Faculty mentor: Nancy Barron, Chase Edwards, Sibylle Gruber, Claire Seel

Morning, 9:30am-10:30am, Skydome East Concourse - ADA section

Title: How Students in the Interdisciplinary Writing Program Utilized the Rhetorical Situation and Social Media to Reach out to Incoming Freshmen

Incoming college freshmen are occasionally ill prepared for college level writing expectations and do not know what to expect or how to prepare for these higher level classes. This project aims to utilize social media outlets, in this case Youtube, to reach out to our target audience and provide pertinent information. The information available in our three videos included an introduction to who the Interdisciplinary Writing Program is, an explanation of the rhetorical situation and it's applications, and lastly some of the writing resources available on campus. Youtube was the chosen social media platform because of its popularity with our target audience. Vlogging (video blogging) has become a popular pastime with young adults and the educational possibilities have become more popular with teachers, who are the second target audience.

Esona, Kailah
Anne Gatlin
Faculty mentor: Will Cordeiro

Session I, 9:00am-11:00am, 105C

Title: Psychological Issues Within the Transgender Community throughout the Changing Process

For the honors symposium, the topic that we would like to research and find out more about is the transgender community's psychological issues that occur during their changing process. To become who they really are leaves a big impact on, not only their personal lives, but their family, close friends, and other people around them. From learning the material in class, some people went into a state of
isolation and depression, while others had an easy time with the 'transformation' process. It would be interesting to learn about each individual's story (if they are willing to share with us) just like we've been doing in class so far. In order to collect data for this project, we'd most likely start with a foundation for our research. The foundation would be the background information for our topic that we've established, which would be mostly sources from the internet, textbooks, or peer-reviewed articles. After this step, we could possibly move onto collecting data that is related to NAU that could include going out into the community. It would be very beneficial and interesting to reach out to students in the LGBTQ community and ask about their experiences, feelings, and stories. Specifically, for this information where we ask about their experiences, we'd like to make sure that they are represented well and are not uncomfortable with the project. We will most likely have them sign a form or waiver of some sort to make sure that they understand the whole concept behind the project and our intentions and information on the questions that will be asked. We will also mention that they can remain anonymous or portray themselves under an alias or a different name so that they are not uncomfortable in any way, if they wanted to share their story. Having several case studies will further our perspectives on this community and will inform us more about the problems that happen behind the smiles and confidences of each person. We'll also possibly include charts and information of the foundation that we discussed earlier, and include the stories of the people that we potentially interview, along with possible pictures of these said people (if permission is granted).

Espinoza, Emilio
Faculty mentor: Brandy Judson

Session II, 2:00pm-4:00pm, 99D
Title: Behavioral Change Project: Free Time to Excercise
My project was designed to help me take the free time that I had and utilize it to help me better myself. Instead of wasting my free time, I would motivate myself to become more active. I would create a plan of how much free time I had for each week, and through self motivation and assistance from friends, I would go out and be active.

Esplin, Ra'Shae
Faculty mentor: John Gibbs

Session I, 9:00am-11:00am, 9B
Title: Self-Assembly of Janus Particles Under Chemical Propulsion and Magnetic Fields
Spherical Janus particles are microscopically small beads comprised of two hemispheres of different materials, e.g., silicon dioxide with a metal coating such as nickel or platinum. We investigated such Janus spheres in aqueous suspensions under different conditions to observe their movement and self-assembly. We first observed chemically propelled nickel and platinum Janus spheres in a magnetic field and how they changed both in direction and speed as a function of the field. Next we observed the self-assembly of the particles using a scanning electron microscope (SEM) for three different particles: (1) a non-magnetized, chemically active magnetic particles, (2) magnetized chemically active particles, and (3) non-magnetic particles. For each situation, the aggregation patterns were observed in both (a) water alone, and (b) water with hydrogen peroxide (the chemical fuel). We found the aggregation was induced by both the magnetic material as well as the chemical fuel but distinct
differences were observed for each experiment. These results help clarify the underlying mechanism of active chemically propelled motors at the microscale.

**Esson, Roger**

*Faculty mentor:* Mark Manone, Rebecca Butcher

**Session II, 2:00pm-4:00pm, 122C**

*Title: The silent affect of geographic hazards*

My project is about how to geological landscapes and hazards effect residential and commercial real-estate. The main reason why geological hazards happen and how they can change over time which can affect many residential areas. Giving the real information on how hazards start and where they start specifically.

**Evras, Moriah**

Terrion Reynolds, Dana Giuffre

*Faculty mentor:* Melissa Birkett, Lucan Klein

**Session I, 9:00am-11:00am, 128C**

*Title: Physiological and Psychological Effects of Music on the Human Body and Brain*

This project will have highlights of the physical and psychological effects of music in people. It will go into further detail describing how heart rate, emotions, and mind-set can be affected by music.

**Fair, Tarrin**

Erick Centeno, Andrew Dicarlo

*Faculty mentor:* Tarrin Fair

**Session II, 2:00pm-4:00pm, 38C**

*Title: An Analysis of Publicly Funded Sports Stadiums*

Our project aims to analyze the public funding process of recently constructed sports stadiums such as the Cowboy's Stadium and future stadium projects in Las Vegas and Los Angeles. We will then do a cost-benefit analysis of these funding processes. Some factors included will be the revenue generated by the stadium, revenue generated by local businesses, and the effect on the local populace.

**Fallis, Katheryn**

*Faculty mentor:* Brandy Judson

**Session I, 9:00am-11:00am, 98A**

*Title: Volunteering*

In my SW-310 class, we were asked to pick a behavior change we would like to make in our life. My behavior change was volunteering, my goal is to volunteer at Hope Cottage (the women's shelter in Flagstaff), every Wednesday for the rest of the semester. There are many different steps I had to take that was necessary to reach my goal. The desired outcome regarding the behavior change that I wanted was, I hoped that after I volunteered throughout the semester, I would’ve gained a better understanding and appreciation for the women in my local community who need assistance.
Fardelos, Alexandra  
Stein Cheatham  
**Faculty mentor:** Christine Lemley

**Session II, 2:00pm-4:00pm, 48B**

**Title:** Drawing on Culturally Responsive Teaching in the General Music Classroom

In this research presentation, we will be drawing on Culturally Responsive Teaching in the General Music Classroom, while demonstrating total engagement. Throughout our research, we will consider the following question: What makes protest songs so powerful? We will start with the quote from Lady GaGa discussing her concerts: 'The Monster Ball is by nature a protest: A youth church experience to speak out and celebrate against all forms of discrimination and prejudice.' As we use the theoretical Framework of Culturally Responsive Teaching, we will consider validating and affirming, comprehensive, multidimensional, liberating, empowering, and transformative in the pedagogy of our lesson.

Farmer, Kira  
**Faculty mentor:** Gwendolyn Saul

**Session I, 9:00am-11:00am, 67A**

**Title:** The Significance of a Seed

Current agricultural practices in the US and other Westernized parts of the world are causing a loss of biodiversity, contributing to food insecurities and the destabilization of the traditional food systems of many Indigenous communities around the world. One approach that is successfully combating these losses is the creation of Seed Bank/Library initiatives. Native Seeds/SEARCH is an organization based out of Tucson, Arizona whose seed bank uses a two-part approach to preserving the genetic diversity of traditional crops in Southwestern United States and Northwestern Mexico. The seeds they preserve maintain the genetic legacy of the region, which is becoming overrun with genetically modified substitutes that are subsidized by the US government. The main contribution of seed banks in preserving agricultural diversity is through their conservation of the genetic purity and integrity of traditional seed varieties that are integral to the biodiversity of a region. The influence of seed banks in the current agricultural atmosphere is environmentally beneficial in a society where genetically modified seeds are corrupting the integrity of the ecosystem. Seed Banks promote and reinforce Indigenous food sovereignty and the struggle for self-determination and have a symbolic nature that encourages the preservation of diversity in both sustenance and people.

Farmer, Kira  
**Faculty mentor:** Christopher Jocks

**Session II, 2:00pm-4:00pm, 67A**

**Title:** Indigenous Methodologies: Vital to Research

This project articulates and demonstrates the principles of Indigenous research methodologies and emphasizes their importance in a variety of inquiry initiatives. The importance will be exemplified through an analysis and critique (using Indigenous frameworks) of the interdisciplinary anthropological research conducted by myself and presented at the Society for Applied Anthropology annual conference in their student salon. Analyzing the successes and failures of integrating
Indigenous methodologies into my research will provide the opportunity to highlight specific Indigenous methods that could be utilized in similar research to the benefit of academia, researchers, and the communities involved. This project will demonstrate that research of all varieties must be cognizant of and include Indigenous research frameworks in order to yield holistic and valid results.

**Farrell, Kevin**

Ralph Ubert, Amal Abdelaziz, TJ Sullivan

**Faculty mentor:** Alarick Reiboldt, Brendan Russo, Mark Lamer

**Afternoon, 1:15pm-1:40pm, duBois Marshall Room**

**Title:** City of Flagstaff Roundabout Design

The goal of the project is to redesign the intersection of Old Walnut Canyon Road/Oakmont Drive and Country Club Drive. Currently, the intersection is two-way stop controlled with vehicular traffic stopping on the east/west legs. We have been tasked with designing a roundabout that will fit within the City of Flagstaff right-a-way. This project has been budgeted by the City of Flagstaff Capital Improvement Program for the fiscal year of 2018-2019. Traveling northbound into the intersection there is a small hill that reduces the sight distance for vehicles attempting to make left and right turns onto Country Club Drive. The hope is that constructing a roundabout will increase safety and allow vehicles to travel through the intersection with more ease.

**Felix, Megan**

**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 57C**

**Title:** Theological beginnings

Gobekli Tepe is known as one of the oldest places of worship that was man made. In my project I plan to dig deeper and provide answers on exactly how the people who rendered these fascinating forms of architecture and how they used it to practice their religion/spirituality during 9130-7370 BCE. Not only will I examine how they practiced their religion but I will see who they considered to be their God.

**Felix Caudillo, Jorge**

Tsosie Schneider, Sean Baquiro, Matthew Enright

**Faculty mentor:** Maggie Vanderberg, Ryan Anderson

**Session II, 2:00pm-4:00pm, 4B**

**Title:** Automated Terrain Mapping of Mars

Dr. Ryan Anderson from the US Geological Survey Astrological Science Center is a planetary scientist working on the geologic mapping and characterization of Mars. He relies on high-resolution images and the manual mapping of terrains in these images to study and learn about Mars' landscape. The goal of our senior capstone project was to provide USGS with a more efficient approach to mapping terrains such as valleys, canyons, sinuous ridges, and sand dunes on Mars' surface. The manual method required identifying and annotating terrains by hand, and could take months to complete. This process was not only inefficient, but it was also inconsistent due to time constraints and human fatigue, which could easily lead to mistakes. We developed a customized software solution that automates the
annotation process by taking in an orbital data set with a terrain type of interest (e.g., canyons) and applying a neural network to detect similar terrain in an efficient amount of time. More specifically, the designed computer program will allow human users to automate the task of identifying characteristic terrain types on Mars' surface by loading HiRISE (i.e., high resolution) images into the system for processing, have the neural network learn to recognize certain terrain types, then produce the results as a color-coded image.

Felix Caudillo, Jorge  
Tsosie Schneider, Sean Baquiro, Matthew Enright  
Faculty mentor: Maggie Vanderberg, Ryan Anderson

Morning, 9:20am-9:45am, duBois Meadows Room

Title: Automated Terrain Mapping of Mars
Dr. Ryan Anderson from the US Geological Survey Astrological Science Center is a planetary scientist working on the geologic mapping and characterization of Mars. He relies on high-resolution images and the manual mapping of terrains in these images to study and learn about Mars' landscape. The goal of our senior capstone project was to provide USGS with a more efficient approach to mapping terrains such as valleys, canyons, sinuous ridges, and sand dunes on Mars' surface. The manual method required identifying and annotating terrains by hand, and could take months to complete. This process was not only inefficient, but it was also inconsistent due to time constraints and human fatigue, which could easily lead to mistakes. We developed a customized software solution that automates the annotation process by taking in an orbital data set with a terrain type of interest (e.g., canyons) and applying a neural network to detect similar terrain in an efficient amount of time. More specifically, the designed computer program will allow human users to automate the task of identifying characteristic terrain types on Mars' surface by loading HiRISE (i.e., high resolution) images into the system for processing, have the neural network learn to recognize certain terrain types, then produce the results as a color-coded image.

Fielder, Katie  
Faculty mentor: Anne Scott

Afternoon, 2:00pm-3:00pm, Skydome Stage A

Title: A False Confession of Justice
False confessions have become a phenomenon in society. Hundreds of individuals are being exonerated on the grounds of providing a false confession. Unfortunately, there are still countless others who sit behind bars for a crime they did not commit because they produced a false confession. This presentation looks at the types of false confessions, how the confession is coerced from an individual, and what can be done to eliminate false confessions from the justice system. False confessions destroy the lives of both parties involved in the case. Both families are struggling to deal with the reality of what just occurred; meanwhile, the real perpetrator remains among the population and continues to cause devastation. This is a vicious cycle that causes destruction and it is essential that this cycle is stopped. With education about false confessions and implementing some of the strategies that have been suggested there can be an end to the phenomenon of false confessions. People can be saved from a traumatic experience and true justice can be served.
Flitton, Chloe
Jessie Rodriguez
Faculty mentor: Gerald Wood

Session I, 9:00am-11:00am, 48C
Title: Lessons for School Reform in the United States: Looking at South Korea and Finland
The purpose of this project is to compare educational systems in both South Korea and Finland, both positive and negatives. The goal is to bring forth ideas that could be used to create a uniform educational philosophy in the United States. South Korea is a leading country in the world for education. However, they have the highest teen suicide rate which corresponds to the rigorous schooling and pressure put on students. On the other hand, Finland is fifth in the country for education and is known for their less is more philosophy that has a positive effect on both teachers and students. The United States could use both countries as examples to better the education of their students.

Florence, Mackenzie
Mandalyn Ryan
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 84C
Title: The Efficacy of Virtual Reality Exposure Therapy on Fear of Flying: A Systematic Review and Meta-Analysis
Virtual Reality Exposure Therapy (VRET) is a developing treatment method that has been examined in recent psychotherapy clinical trials. In this systematic literature review (SLR) and quantitative-meta-analysis, we evaluate the efficacy of VRET on symptoms of flying phobia. Meta-analyses are the most reliable source of information on a specific topic due to its rigorous criteria and search process, and it allows researchers to determine the efficacy of the treatment that is being implemented and analyzed. Method: Several searches were conducted through the PsychINFO database and the PubMed database that were consistent with best-practice standards (Prisma-P). Articles included in the meta-analysis included randomized control trials (RCTs) and non-randomized control trials (non-RCTs) in which VRET was compared to a control condition. There were a total of 16 articles that met our specific criteria initially, and will be narrowed down further as the SLR and meta-analysis progresses. Results: Methodology and results of located clinical trials that meet including criteria will be reviewed and summarized. For the meta-analysis, the effect size for each clinical trial will be calculated. Then, an overall effect size statistic will be calculated for all of the trials. These statistical analyses will be conducted using the statistical program Comprehensive Meta-Analysis (CMA) software, Version 3. Conclusion: Key findings will be presented, strengths and limitations of the published clinical trials will be noted, and suggestions for future research will be offered.

Flores, Janinne
Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 122B
Title: Conflicting Identities of Mexican Americans
The social construction of race and what it means in the United States has historically marginalized a myriad of groups. While certain groups of people have been able to overcome the discrimination and
be accepted by society, Mexican Americans have yet to achieve this. The way the United States views and stereotypes what a Mexican American should look and behave like has influenced the way they are treated throughout history. Society has failed to recognize that Mexican Americans vary in physical features, religion, beliefs, language, socioeconomic status, race, and political views. This research project aims to determine if the way society views Mexican Americans impacts how Mexican Americans not only identify and view themselves, but how they identify and view each other.

Flores, Nelson  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 57C**

**Title: Pre History Art : through the ages**

My project is a summary of pre history art through the ages. my project covers from 2 kya to 200 kya. my project will be able to be easily read and have a large poster with images of the art during a certain period in time. Also, my project will have small mock up figurines of the art being described in the poster. the mock up figurines will be of animal paintings or early venus figurines.

Flynn, Moriah  
Daniella Clara, Joshua Terry, Kierston Terry, Kelsey Lamberton  
**Faculty mentor:** Nicole Bies-Hernandez

**Session I, 9:00am-11:00am, 70C**

**Title: The Effects Different Presentations of Information has on Memory Retention**

The current study investigated whether different presentation of the same information affects memory retention, and if the believability of the information depended on the presentation. Previous studies have shown that people recall more information from a social media outlet compared to simple text (e.g., Mickes et al., 2013), but no research has been conducted using the same information to compare the two. Specifically, the present study wanted to see if people would retain more information based on the format it was presented in. Information was presented in two formats, Facebook or plain text, to the participants, manipulated using independent-groups, and then they were given a questionnaire to measure the information retained. In the questionnaire, there was also a Likert-scale question to measure believability (i.e., whether they thought the content was true). One part of the hypothesis was that if participants were presented the same information through a social media outlet, then more information would be retained compared to a simple text. The second part of the hypothesis was that if participants were presented the Facebook format, then they would be more likely to believe it then if they were presented the simple text format. If the predicted results were found, then it could be implied that social media could increase a person’s memory retention.

Foley, Kaitlin  
**Faculty mentor:** Marie Baker-Ohler

**Session I, 9:00am-11:00am, 87D**

**Title: More Than Addiction**

Interpersonal relationships provide a sense of acknowledgment and belonging. The relationships we form throughout life have a tremendous effect on us and how we communicate. We depend on
relationships to get us through difficult times in life. These relationships become reliable and predictable as we disclose more and more. What happens when these relationships change? What do we do when a loved one becomes a different person? The relationship becomes strained and the experiences shared with that person seem to fade away. Many factors play a role in interpersonal relationships coming to an end. Addiction has the power to change a person and end relationships. Addiction is a growing epidemic in the United States. With nearly one in every ten people becoming addicted to drugs or alcohol, we can almost guarantee everyone will be impacted by addiction one way or another. The goal of this project is to show how addiction can ruin interpersonal relationships, as well as how lack of interpersonal relationships puts you at a higher risk for addiction.

Forbes, Wolfgang

Faculty mentor: Lee Amoroso, Annette Sunda

Session I, 9:00am-11:00am, 13D

Title: Dune Migration on the Navajo Reservation and possible links to Climate Change

The recent drought in the American Southwest is beginning to change the landscape and affecting the people who live in the region. The increasing migration rates of sand dunes on the Navajo reservation the past several years reflect some of these changes. By analyzing aerial photography of the region over the past twenty years, and comparing the calculated rates to other dune fields, it shows a possible trend occurring on a global scale. Mapping of Holocene age dune deposits in the Hopi Buttes area, 50 kilometers north of Winslow, Az, show a distinct difference in the sediment source of the active vs non-active dunes, and that the increased amount of available sediment for transport corresponds to a changing climate.

Foss, Kimberly

Luke Chiverton, Marissa Adkins

Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 84A

Title: Effectiveness and efficacy of Individual Cognitive Behavioral Therapy in Adolescent Substance Abuse

This poster examines the efficacy and effectiveness of individual cognitive behavior therapy for adolescents with substance abuse disorder. Previously addressed by Hogue, Henderson, Ozechowski & Robbins (2014), this article reviews their analysis of the efficacy of behavioral therapy on adolescent substance abuse and examines some of the more recent literature on the topic. Using a total of 15 studies, the poster provides a detailed recount of the procedures used to find the literature on the topic, including search terms used and databases searched. Of the articles examined from the search results, the studies that met the criteria of randomized control trials were extracted and used to produce the findings shown in the poster. Subsequent discussion and analysis of the results are discussed as well.

Fowler, Martha

Robert Kellar

Faculty mentor: Robert Kellar

Session II, 2:00pm-4:00pm, 34C
Title: *Extraction and Isolation of Adipose-Derived Stem Cells*

Adipose-derived stem cells (ADSC) have gained a substantial amount of attention in the field of regenerative medicine due to their cellular properties such as cell differentiation, self-renewal, and availability within the donor. ADSC are prevalent in two types of adipose tissue known as white adipose tissue (WAT) and brown adipose tissue (BAT). White adipose tissue is the most common in the body and serves as an insulator and aids in energy metabolism while brown adipose tissue is primarily involved in heat production. With a higher prevalence of white adipose tissue within the body, white adipose tissue in comparison with brown adipose tissue should result in a higher amount of tissue extraction, easy identifiable tissue depots for these tissue extractions, and exhibit appropriate isolation conditions for therapeutic applications. This hypothesis will be tested through white and brown adipose tissue extractions from mice, along with an isolation procedure to identify comparable properties of the two tissue types.

Frampton, Joshua  
Temitope Alaga, John Dance, Jun Rao  
Frampton, Joshua  
Faculty mentor: Steven Jacobs  

Session II, 2:00pm-4:00pm, 4A  
Title: *HelpTile Mobile Application for Tagging Websites*

HelpTile Inc. has sponsored our team to develop a mobile app in order to extend their current functionality of a web site tagging system to further platforms to link website content like Facebook 'tags' photos. Their current platform is limited to a Google Chrome web-browser extension and so they are trying to build out their platform to include a wider audience. Building the HelpTile application into a mobile app will allow for more people to easily access the technology. Since the current desktop application is built into a Google Chrome browser extension, it is not currently easy or possible to use the application outside with any other browser. This mobile application will show that it is possible to port this technology to a variety of platforms and show that the technology can be viable. Our final deliverable is a proof of concept mobile app that is portable and responsive to other mobile platforms and allows for the same functionality provided in the HelpTile Chrome browser extension.

Frampton, Joshua  
Temitope Alaga, John Dance, Jun Rao  
Frampton, Joshua  
Faculty mentor: Steven Jacobs  

Morning, 9:45am-10:10am, duBois Meadows Room  
Title: *HelpTile Mobile Application for Tagging Websites*

HelpTile Inc. has sponsored our team to develop a mobile app in order to extend their current functionality of a web site tagging system to further platforms to link website content like Facebook 'tags' photos. Their current platform is limited to a Google Chrome web-browser extension and so they are trying to build out their platform to include a wider audience. Building the HelpTile application into a mobile app will allow for more people to easily access the technology. Since the current desktop application is built into a Google Chrome browser extension, it is not currently easy or possible to use the application outside with any other browser. This mobile application will show that it is possible to port this technology to a variety of platforms and show that the technology can be viable. Our final
deliverable is a proof of concept mobile app that is portable and responsive to other mobile platforms and allows for the same functionality provided in the HelpTile Chrome browser extension.

Frank, Chase  
**Faculty mentor:** Amber Nicole Pfannenstiel  
**Midday, 11:30am-12:30pm, Skydome East Concourse - ADA section**  
**Title: Videogames and the Importance of Choice**  
My presentation is about how video games teach us the importance of choice. Not just making decisions but the capability of analyzing a situation, assessing your options and making the correct informed decision for that particular situations. Using ideas of learning through play and electracy presented by author Jan Holmevik in his book Inter/vention, as well as numerous video games both past and present such as Mario Kart, Fire Emblem, Call of Duty and even mobile games like Trivia Crack, I will make the argument that video games have a lot to teach us not just about critical decision making but about numerous aspects of life by extension.

Frey, Emmaline  
**Faculty mentor:** Brian Stone  
**Afternoon, 3:00pm-3:20pm, Skydome Stage A**  
**Title: From School to Shoal: A Manifesto for Authentic Education**  
A group of fish who swim together with a synchronized pattern, at the same speed and in the same direction is called a ‘school.’ Ironically, this description also closely depicts how the typical American public school views and expects children to behave, academically and otherwise. This assembly line model of elementary education does not represent a system through which we can educate all children effectively or meaningfully. In order to keep students engaged, excited, and educated, a progressive model of education based on constructivist and humanist philosophies is essential, and a time for change in the culture and expectations of education is far past due. Child-centered, choice-based, exploratory, and individualized education could revolutionize the way we teach children and the relationships students have to learning.

Gabriele, Monica  
**Jalen Prayer**  
**Faculty mentor:** Gregory Busath, Viktoria Tidikis  
**Session II, 2:00pm-4:00pm, 75A**  
**Title: Socioeconomic Factors and its Effect on Depression in Young Adults**  
This research examines different socioeconomic factors that can effect young adults between the ages of 18 and 25 with depressive symptoms. We used an online survey to examine this correlation. For most of the questions we used the Rosenberg Self-Esteem Scale which is a 6 item scale ranging from Strongly Disagree to Strongly Agree to see if the participants felt positively with the statement provided or negatively. We also had to customize some of our questions for the purpose of our own study that we conducted.

Gagnon, Jalyn
Faculty mentor: Miguel Vasquez

Session I, 9:00am-11:00am, 57D
Title: The prehistory of The Domestication of Animals
Have you ever wondered how animals became such a big part of our lives? How they went from being hunted and tracked, to farmed and kept as pets? I plan to create a poster about the prehistory of the domestication of animals. I want to start by explaining how humans came to domesticate animals, so that my audience will have some background on the subject. Then I would like to move on to how the domestication of animals has changed over time. I will conclude with the outcomes of the domestication of animals. I not only want to explain how the domestication of animals came about, but also how it continues to be an integral part of every culture today. I will have a list of positives and negatives, and explain both viewpoints.

Gale, Alisa
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 57D
Title: The Origin of Religion in the Neolithic Era
This project will be based on the prehistory of religion, focusing on the origins of religion during the Neolithic age. This will be presented on a poster and formatted in a way that compares the differences in early religion to help explain the beginnings of polytheism vs. monotheism. The project will show the first signs of religion such as the start of rituals, animal sacrifice, etc. and give a better idea of where and when they began. The goal is to present the beginning of religions in different regions to compare the different influences each society used.

Galvez, Veronica
Faculty mentor: Marie Baker-Ohler

Session II, 2:00pm-4:00pm, 83B
Title: Acknowledgment Through Attachment and Affection
Nonverbal communication is essential to the way individuals send and receive messages to interact with each other. The majority of what we translate about other people is based significantly on their nonverbal actions and behaviors. Infants as young as 45 minutes begin to immediately attach themselves to their caregiver, developing a sense of affection towards them that sets the foundation for a secure, healthy relationship between the two. During this early stage of infancy, attachments are initially made non-verbally via caressing, kissing, and eye contact. Using Michael J. Hyde's metaphorical meanings of hope, home, loving kindness, and acknowledgment, it is the intended goal of this project to highlight that children need hope in order to feel at home where they can be accepted and through loving kindness shown affection. Affection is therefore nonverbal communication that allows positive acknowledgment.

Gannon, Claire
Faculty mentor: Brandy Judson

Session II, 2:00pm-4:00pm, 98A
Title: Behavioral Change: Sleep Habits
For 9 weeks I will be implementing different strategies into my daily routine to change my sleeping habits. The goal is to receive nine hours of sleep each night, and create a consistent sleep routine, such as going to bed and waking up at the same time each day and night. I will document my strategies and the advantages and disadvantages of this routine.

Garcia, Brandon
Jonathon Credo, Jani Ingram, Tommy Rock
Faculty mentor: Jani Ingram

Session I, 9:00am-11:00am, 22A
Title: Analyzing the Water Supply: Detecting Arsenic Concentrations in Unregulated Wells on the Navajo/Hopi Reservation
Arsenic is a naturally occurring acknowledged toxin and carcinogen that is known to cause various cancers, as well as other negative effects such as cardiovascular issues, metabolic disorders, and birth defects. The United States Environmental Protection Agency's (USEPA) regulatory limit for arsenic in water sources is 10 parts per billion (ppb). The arsenic concentration is known to be significantly higher in many areas of the southwestern United States, exceeding the USEPA's regulatory limit. With these known issues and possible elevated levels of arsenic, samples were collected from both the Navajo and Hopi Reservations, since the use of unregulated wells still serve as the primary sources of water for these communities. Previous work has shown that the Colorado Plateau, where both reservations are located, has varying levels of arsenic in ground and surface water sources. Samples were collected from various unregulated wells throughout the reservations to determine the range at which the arsenic levels exceed the USEPA limit. Sample analysis was performed via Inductively Coupled Plasma Mass Spectrometry (ICP-MS). This instrument is able to detect arsenic concentrations as low as 0.5 ppb. When performing the trace metal analysis, multiple samples from each location were run to ensure the data was consistent. As of now, the data is still being processed and is still too early to determine if the arsenic concentrations are toxic.

Garcia, Rachel
Faculty mentor: Christopher Johnson

Session I, 9:00am-11:00am, 86A
Title: Ecoflow app for the iWatch
Fast and most efficient way to conserve water for the bath or shower. For this project, I had to create an app for the iWatch for my Visual Communications class where I designed interactive apps for user experience. With this concept, I hope that it can reduce the usage of water while either taking a bath or shower more effectively.

Gardner, Edward
Faculty mentor: Amber Nicole Pfannenstiel

Morning, 10:30am-11:30am, Skydome East Concourse - ADA section
Title: Building a Better Dungeon: Intended and Perceived Learning
It is after the lesson when a student truly learns, and unfortunately not all students learn the same; there will always be cases where one student takes away something entirely different than another. After a while, modal learning habits and roles are established: a student might take the role akin of a wizard: the one that best studied the textbook, another student might be the rogue of the class, the one that best finds the puzzles in the test or homework. These metaphorical roles, or characters, are intended phenomena to role-playing games such as Dungeons & Dragons. The technique of getting into character and the reflection of ones experience is ever present in role-playing games, as introspection and character growth is rewarded by experience points, levels, and powers. This method of growth is purposely triggered in education, as students are given examples and readings and are asked to analyze or act the teachings to help expand the students familiarity with a subject. But, what a teacher or a Dungeon Master wants their students or players to understand changes from person to person, and Dungeons & Dragons accommodates this shift with play. I argue, to better teach and control wayward or harmful learning begins with a better lesson, or in a game, the dungeon.

Garibaldi, Gina Rae
Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 98B
Title: My Spending Behavioral Change
I want to stop spending money on unnecessary items such as apparel, accessories, and eating out, so I have created a plan of action to change my behavior. There are four steps that are necessary for me to succeed. In order to keep track of my progress, I created a table and in each row (week 1, week 2, and so on), I have counted the total number of times I spent money on meals out, browsed online shopping stores, or bought something I did not need. Also in each row is the total amount of money I spent that week. Each week, it will help me reflect on what was actually necessary to purchase and what I could have gone without. It is important for me to change how much I spend and to keep track of my finances because I have realized the amount of money in my bank account has decreased tremendously due to unnecessary spending.

Garner, Martha
Faculty mentor: Julie Moreau

Session II, 2:00pm-4:00pm, 91C
Title: An Affective Lens: Judgment and Decision Making Psychology and Affect Theory
This project aims to establish a link between Affect Theory and Judgement and Decision Making Psychology through answering the following questions: How are decisions conceptualized? How do these notions connect to neoliberalism, and what are the consequences or repercussions of these conceptualizations? In analyzing the connections between neoliberalism and JDM Psychology, how can affect theory be employed and what can be learned through an affective lens? With this project, the author wishes to investigate what can be learned using Affect Theory with regard to questions of neoliberalism and rationality.

Garner, Martha
Faculty mentor: Sheila Nair
Morning, 9:30am-9:50am, Skydome Stage A

**Title: Intersectionality and Health Disparities: Applying an Intersectional Lens to the Supplemental Nutrition Program for Women, Infants, and Children**

Through analyzing the literature about the Supplemental Nutrition Program for Women, Infants, and Children (WIC), many disparities and inequities are discussed with a public health lens that aims to address these inequalities to access. However, the solutions proposed are often narrow in focus and fail to demonstrate the connections between such inequities and greater systems of privilege and oppression. Through an intersectional feminist lens, this project attempts to address some of these gaps in the literature. Specifically, an intersectional lens grounded in black feminist theorizing will be applied to analyze and interpret the WIC program in the state of Texas. This project will begin by reviewing the use of the term intersectionality, and the background of the WIC program as implemented in Texas. The current solutions suggested through public health literature will be explored, and an intersectional lens will be used to contextualize and expand possible solutions to these inequities.

**Gaskin, Cameron**

Hassan Allison, Jesse Brookins, Tylor Brown, Vanssamuel Diggs, Corbin Jountti, Ronnie Manning, Devin Stevenson, Justice Walker, Gavin Wright

**Faculty mentor:** Frederick Gooding, Ricardo Guthrie

Session II, 2:00pm-4:00pm, 108A

**Title: South Africa: The Painful Truth**

In 1993 Anti-Apartheid Revolutionary Nelson Mandela, and Apartheid President Frederik Willem de Klerk, accepted the Nobel Peace Prize for their work for the peaceful termination of the apartheid regime, and for laying the foundations for a new democratic South Africa. This new South Africa would be a place where the ethnically diverse would be allowed to flourish, and the issues of race would fade under the weight of this new unity. Over the winter, a group of ten Gold N’ Brown men journeyed to the Republic of South Africa to examine the dynamics of race in the ‘new’ South Africa. To examine such a complex issue, we spent time in three major cities in South Africa; Cape Town, Johannesburg, and Pretoria. In each city we talked and mingled with locals, went to museums, and visited historical sites to see if we could grasp how race, in this post Apartheid society, affects the ways in which everyday people live their lives. The insight we were able to glean from all of these activities allowed us to gain a further insight into the realities of the ‘new’ South Africa, as well as draw direct parallels with the realities of the United States, both present and past.

**Gass, Christopher**

**Faculty mentor:** Michael Shafer

Session II, 2:00pm-4:00pm, 3B

**Title: Unmanned Aerial System (UAS) for Wildlife Tracking**

Wildlife radio transmitters are currently employed by wildlife biologists and ecologists to track small animal populations such as birds and bats. Researchers must hike to high ground in order to obtain a clear signal from the tagged animals, increasing tracking time and decreasing possible sample sizes. The additional time spent manually tracking animals limits our understanding of the habitats and activities of the studied species. To facilitate the faster collection of data, an unmanned aerial vehicle
(UAV) was developed to carry a radio telemetry antenna. The higher altitude achievable by the UAV reduces the need to locate high ground and improves signal clarity. The use of a MATLAB®-based program allows for a more automated determination of signal direction. Further improvements in portability and ease of use would allow for operation of UAVs in additional wildlife tracking roles.

Geck, Kaitlyn

Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 58A

Title: The Prehistory of Death and the Afterlife
My project will examine the earliest known burial techniques and beliefs involving life, death and the afterlife.

Gehret, Elizabeth

Curtis Dankof, Lisa Chien

Faculty mentor: Lisa Chien

Session II, 2:00pm-4:00pm, 11A

Title: Numerical Modeling of Star Formation Mechanisms within Interacting Galaxies
Galaxy collisions provide us with an empirical laboratory that allow us to analyze how galactic star formation is affected by major restructuring of the galaxy's shape due to interactions with another galaxy. Many past observational studies have been conducted with the goal of understanding the link between galaxy interaction and induced star formation. However, the mechanism that is inducing star formation within interacting galaxies is still not fully understood. Studies have shown two possible mechanisms to describe this phenomenon: gas density dependent star formation and star formation induced by shock waves. Numerical modeling of the density dependent model has shown this to be an incomplete description of the driving force behind star formation in interacting galaxies. In this project we make numerical models of the interacting galaxy pair NGC3395/96, with both star formation mechanisms mentioned above. NGC3395/96 is a late stage galaxy pair, which has already begun the merging process. We use N-body gravitational simulations to reproduce star formation within these galaxies by the two mechanisms mentioned above. We compare a range of 16 different simulation parameters to the observations in a survey-type analysis to narrow down the possible sets of initial conditions that can replicate our observations.

Gerety, Danielle

Kianna Roper, Amee Park

Faculty mentor: Lisa Tichavsky

Session II, 2:00pm-4:00pm, 103B

Title: Abuse and the Impact of Self-Esteem
The purpose of this study is to identify what factors contribute to an individual experiencing an abusive relationship. We expect that people with lower self-esteem are more likely to experience an abusive relationship. We conducted an online survey which was advertised via social media and face-to-face surveys of college students at a mid-sized southwestern University. We asked questions about self-esteem, happiness, income, marital status, witness of abuse, and attitudes toward abuse using the
Partner Abuse Scale (Corcoran & Fisher, 2000). We also controlled for temporal order by asking when the events occurred. We utilized OLS regression to test the hypothesis that individuals who have lowered self-esteem are more likely to experience an abusive relationship, controlling for time since last abusive experience. The results and conclusions of the study are in progress but will be provided.

**Gibbs, Britni**
Hannah Nadeau, Christi Fogtman, Christine Goitia, Darlene Escobedo
**Faculty mentor:** Jamie Clem

**Session II, 2:00pm-4:00pm, 98B**
**Title: College Students Level of Happiness**
Findings on a students level of happiness based on factors such as health, sleep patterns, and course load.

**Gipe, Kyle**
**Faculty mentor:** Stefanie Kunze

**Session I, 9:00am-11:00am, 68A**
**Title: Alcoholism in Reservations**
Alcoholism in the reservation is an issue that has been around since the beginning, the issue is how to stop this problem and help the people that have been effected. The journals, articles, and book excerpts included in this paper explain the prevalence of alcoholism in Native American Communities, examples of communities trying to stop this from happening, and prevention programs. The issue has been established and data has been gathered, however there is not enough of an effort to stop it. The Native American community as a whole has stepped up and have taken steps in trying to prevent and help alcoholism, however this issue is too big to tackle alone. The community has reached out to the United States government but have not received enough help to stop this from continuing to happen. Below is a list of articles, journals, and book excerpts, along with an explanation of what information will pertain in the writing of my final paper.

**Girdosky, Jenna**
Whitney Young, Luke Chiverton, Caroline North, Timothy Broom, Nora Dunbar
**Faculty mentor:** Nora Dunbar

**Session II, 2:00pm-4:00pm, 73B**
**Title: Do Professor and Student Gender Moderate The Association Between Professor-Student Rapport and Student Success?**
Previous research suggests that the sex of a college professor affects the evaluation of that professor (Basow & Howe, 1987). When women professors were rated as competent-talented, there was a bias in favor of the women over the male professor (1987). The purpose of the current study is to examine the student-sex/professor-sex combination to see if it modifies the association between professor-student rapport and student success outcomes. Student-professor rapport was measured through the use of the Professor-Student Rapport Scale (PSRS); which was rated by participants using a 5-point Likert-type Scale. Data was collected from students (N = 765) enrolled at a mid-sized, southwestern university across various departments including criminal justice, psychology, biology, and English. A
series of multiple regression will be used to evaluate whether the sex of the student in combination with the sex of the professor moderates the relationship between student-professor rapport and student success outcomes. We predict that students will report the greatest rapport with professor of their own sex.

Gloor, Jessika
   Steven Hoff, Lamyaa Alrumaidhin, Patrick Bridgman
   Faculty mentor: Gerjen Slim, Wilbert Odem

Session I, 9:00am-11:00am, 8B

Title: Cinder Lake Alternative Landfill Liner Design
The intention of this project is to provide the Cinder Lake Landfill with an efficient and cost-effective landfill liner for use in their expansion project. This liner will be constructed out of recycled and waste materials to promote sustainable construction practices and to aid with upkeep of the geological properties of the land it is on. The materials used in this liner design are paper pulp sludge from the local SCA Tissue Plant along with fly ash. This project evaluates the 1:1 mix of these two materials in conjunction with a small amount of polymer in order to increase cohesion while decreasing permeability. The results of this project will show that this design meets local and federal landfill liner regulations. This includes permeability rates for both gas and liquid flow through this material, which will be presented during this symposium.

Gloor, Jessika
   Steven Hoff, Lamyaa Alrumaidhin, Patrick Bridgman
   Faculty mentor: Gerjen Slim, Wilbert Odem

Afternoon, 2:05pm-2:30pm, duBois Marshall Room

Title: Cinder Lake Alternative Landfill Liner Design
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Gochenour, Kevin
   Faculty mentor: Gerrick Lindberg

Session II, 2:00pm-4:00pm, 22D

Title: Molecular Dynamics Investigation of Benzene Ordering at a Silica Interface
Recent molecular dynamics investigations have focused on the properties governing benzene ordering at the interface of silica nanopores. Because many interesting phenomena relevant for organic synthesis, materials development, and environmental chemistry are governed by behavior at the
interface, understanding the thermodynamics and dynamics of these regions have important implications. The interface between the surface of mesoporous silica and organic solvents is an area of emerging yet poorly understood research. Benzene is the prototypical aromatic organic solvent and understanding the interaction of this aromatic system with a silica surface, in the presence of other organic molecules, can be applied to larger aromatic and substituted systems. This study uses molecular dynamics simulations and computational analysis to assess the dynamic and thermodynamic factors influencing benzene ordering along a silica interface as compared to an interface between liquid and vapor benzene. Both systems were analyzed in the setting of various mole fractions of benzene mixed with the non-aromatic cyclohexane. The analysis is specifically focused on the dynamic and thermodynamic contributions to benzene ordering, and how larger mole fractions of cyclohexane affect these properties effects on benzene. This study will discuss the enthalpic and entropic driving forces for interfacial behavior along with the effects of decreasing benzene concentration.

**Goddard, Wyatt**  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 58A**  
**Title: Death and the Afterlife in pre-historic Europe**  
The topic of this poster will be Death and the afterlife in pre-historic cultures. I am refining this topic by region and narrowing it down to specifically sites in Europe. This poster will be in the form of a timeline. Each site will have a location will have dates, locations, and specific examples of why its important.

**Goettel, Kayleann**  
**Faculty mentor:** Glenn Edgerton, Deborah Craig, Monica Lininger, Scot Raab

**Session I, 9:00am-11:00am, 120D**  
**Title: The Implementation of Strength and Conditioning Exercises to Aid in Decreasing the Incidence of ACL Injuries in Women's Soccer**  
Female soccer athletes have some of the highest rates of ACL injuries in the realm of collegiate sports. There are many anatomical and physiological aspects that predispose female soccer athletes to an ACL injury more so than her male counterpart. A literary review was performed to analyze the effects of injury prevention exercise programs on ACL injury rates for female soccer athletes. 18 scientific articles and studies were reviewed. Each injury prevention exercise program consisted of balancing, strengthening, and plyometric exercises in order to reduce the rate of ACL injuries. By implementing an exercise program that emphasizes these three categories throughout the training of a female soccer team, ACL injury rates can be reduced.

**Gomes, Kamanukea**  
**Faculty mentor:** No mentor provided

**Session I, 9:00am-11:00am, 66C**  
**Title: Ancient Polynesian Hydrotechnology**
I will be studying different types of hydrotechnology throughout ancient Polynesia. I will then create a poster board display that describes each system, how it was made, and what it is used for.

**Gomez, Mark**  
**Faculty mentor:** Britton Shepardson  
**Session I, 9:00am-11:00am, 58B**  
**Title: Religion/Spirituality Across Prehistory in Catalhoyuk**  
My project will have to deal with religion/spirituality in the the site Catalhoyuk and what importance it had on the site. I will be presenting the matter in poster, also discussing of how relevant it is to modern society. I will explain Catalhoyuk's societal reverence to religion/spirituality.

**Gonzales, Krysten**  
**Faculty mentor:** Brandy Judson  
**Session I, 9:00am-11:00am, 98C**  
**Title: Personal Change: Breakfast and Planning**  
Waking up in the morning is a challenge by itself. Sometimes remembering to eat a full breakfast is not so easy, when you can just grab a bar with a cup of coffee and run out the door. But after a couple hours into the day, you start to feel tired and hungry. This is a problem I experience a lot in my life, so as a personal challenge I prepped my meals in advance, woke up 30 minutes earlier, and ate a full meal. As a result, I have been less tired, able to preform better in my classes, and I ate less for lunch and dinner since I was not starving. To conclude, I highly encourage others to eat a full meal and to not skip out. It is true when people say, Breakfast is the most important meal of the day!

**Gonzalez, Alejandro**  
**Faculty mentor:** Mary E. Greenberg  
**Session I, 9:00am-11:00am, 119A**  
**Title: How Does Distraction Compared to No Distraction Affect Pain Perception During Painful Procedures in Pediatric Patients**  
Pain is considered the 'fifth vital sign' to monitor in medical care, and health professionals should monitor and manage it when caring for pediatric patients. Although it is known that pediatric patients feel pain during medical and nursing procedures, there is a lack of use of physiologic and psychologic pain relief for the pediatric population. Distraction is a non-pharmacological intervention used often to reduce needle-related procedural pain in children. Two types of distraction methods are used consisting of passive and active distraction. Passive distraction involves the patient watching a care giver do the distracting; active distraction involves the actual patient performing an action to achieve distraction. Distraction allows the child to focus away from painful stimuli using a variety of senses and is effective in children younger than 7 years of age. It is the aim of this research to show that distraction strategies and interventions during painful procedures in pediatric patients have a positive effect on pain.

**Gonzalez, Bianca**  
**Faculty mentor:** Becky Butcher
Session II, 2:00pm-4:00pm, 126D

**Title: Generation Y or Generation Overwhelmed?**

According to the National Institute of Mental Health, depression is categorized as a mood disorder in which the symptoms affect thoughts, feelings, and the ability to function on a daily basis through normal activities. The purpose of this research project was to explore the rise of depression rates among college campuses. Colleges in the U.S. have seen a rise in depression in millennial-age students, also known as Generation Y. What attributes to this rise and what are some explanations for this mood disorder? This project explores the sociological, psychological and historical aspects of this complex issue. Using the interdisciplinary approach is crucial in understanding the multi-faceted population being examined. How might examining historical data and trends be useful in addressing the growth of this disorder? What will behavioral considerations reveal?

Gonzalez, Joseangel  
**Faculty mentor:** Danielle Ross, Jo'el Johanson

Session II, 2:00pm-4:00pm, 8C

**Title: Examining Algebra 1 Students' Self-efficacy Beliefs after Engaging in a Lesson Focused on Verbal Reasoning During a Challenging Task**

Self-efficacy can be defined as an individual's beliefs and judgments concerning their capabilities in accomplishing certain tasks. When it comes to a mathematics classroom, varying levels of self-efficacy exist among students, all who might be oriented toward a different type of goal as compared to their peers, whether those goals are mastery-oriented or performance-oriented. The desire of many math teachers is to instill high self-efficacy beliefs in their students, which may involve either reshaping negative pre-existing beliefs or starting from scratch and constructing a positive outlook in students' mathematics abilities. The purpose of this research was to observe and analyze the extent to which Algebra I students' self-efficacy beliefs are created or changed. Students participated in a two-day lesson where they engaged in verbal reasoning through a challenging mathematics task. The lesson was used to move the students further toward mathematical proficiency by addressing a few of the 8 Mathematical Practices through a challenging task. The instrument that was used to measure the students' self-efficacy is an adaptation of the Sources of Mathematics Self-Efficacy Scale (SMES) created by Ellen L. Usher and Frank Pajares (2009) with a few added items that addresses the specific topic of the lesson.

Good, Mary  
**Faculty mentor:** Glenn Edgerton

Session I, 9:00am-11:00am, 112C

**Title: Consequences of Concussion in Sport**

This is a literature review on the consequences of a mild traumatic brain injury, or concussion, in sporting events. It is estimated that 47 million American children participate in sports with over 7.6 million of those students participating at the high school level. Football is the most popular sport with 1.1 million high school players. It is also estimated that 300,000 adolescents, under the age of 20, receive a concussion during a sporting activity each year, with football athletes sustaining 41% of documented concussions. This review analyzes the differences concussions pose on children ages 13
to 20 years compared to a population of 20 years and older. It also discusses the current legislature and protocols in place and ways to improve the care for those athletes that have sustained a mild traumatic brain injury.

Grabowsky, Tessa  
Kathrynn McKenzie, Kyle Erwin, Jessica Chamberlain  
**Faculty mentor:** Gregory Busath, Viktoria Tidikis

**Session I, 9:00am-11:00am, 90B**  
**Title: The Relationship Between Anxiety and Academic Performance**  
The purpose of this study is to look into the relationship between anxiety and school performance, specifically the link between high levels of anxiety and hindered school performance (low GPA). Participants (students at Northern Arizona University in the Psychology Research Methods Course) will be surveyed regarding prevalence of anxiety symptoms as well as school performance (GPA). A Pearson correlation will then be used to examine the association between school performance and GPA in college students. By looking into this relationship, universities will better be able to help their students succeed and figure out the frequency of university students with anxiety. Further studies can look into the different types of anxiety as well as what the most effective ways to help students to cope with anxiety are.

Graham, Austin  
**Faculty mentor:** Beth Grimes

**Morning, 10:00am-11:00am, Skydome Stage A**  
**Title: Reap What Is Sewn: Exploitation of the Western Amazon**  
This research paper generally revolves around the troubling conflict between economic progress and ecological health in the most effected regions of the Amazon Rainforest. Peru and Brazil are two of the most Amazon-dependent countries that exist, and therefore, hold a great deal of responsibility for its preservation. Unfortunately, these countries are accredited with a staggering 74% of Amazon carbon emissions along with the constant damaging of several wildlife habitats, thus pushing many species toward extinction. These are only the initial effects of deforestation, much more detriment ensues once the cleared land is actually put to use. Additionally, according to National Geographic, the deforestation of the rain forest not only removes potential habitats, but it reduces the original 50% of moisture generated by the trees that usually becomes rainfall, which would nourish many of the wild and civilized ecosystems. Clearly, deforestation is continuing at an uncontrolled rate and for this ecosystem to continue to flourish, assertive regulation is necessary. But as of today neither country seems to be making any progress toward finding more sustainable methods of stimulating their economies.

Grayson, Dylan  
Conner Swann, Brian Saganey, Brandon Paree,  
**Faculty mentor:** Eck Doerry

**Session II, 2:00pm-4:00pm, 3D**  
**Title: EvaluRate**
In today's workplace, it's almost impossible to avoid working with a group of people on a project. Oftentimes, in order to ensure the project proceeds smoothly, a supervisor needs to communicate individually with team members in order to get any level of valuable feedback. If the supervisor isn't contacting them in person, then it's through some sort of online form or via email, methods that require manual tabulation of results and by no means result in immediate feedback. The solution is EvaluRate, a scalable and customizable web application created for the purpose of issuing and managing peer evaluations -- eliminating the need for combing through and manually computing results from surveys. In order to facilitate a near-infinite set of group configurations, EvaluRate has defined the 'unit' as the base unit of organization. Units can have users attached to them as members, Administrators to manage them, projects to attach evaluations to, and sub-units beneath them with the same properties -- effectively allowing hierarchical structures to be created. Permissions 'bubble down' by default, enabling top-level unit-admins to inspect and manage all child-units in a granular way but also allowing the delegation of administration duties to other users. Using this method to provide structure, one could model numerous different organizations, from the classroom to corporate environments and even stand-alone teams.

Grayson, Dylan
Conner Swann, Brian Saganey, Brandon Paree
Faculty mentor: Eck Doerry

Morning, 11:10am-11:35am, duBois Meadows Room
Title: EvaluRate: Peer Evaluation Software
In today's workplace, it's almost impossible to avoid working with a group of people on a project. Oftentimes, in order to ensure the project proceeds smoothly, a supervisor needs to communicate individually with team members in order to get any level of valuable feedback. If the supervisor isn't contacting them in person, then it's through some sort of online form or via email, methods that require manual tabulation of results and by no means result in immediate feedback. The solution is EvaluRate, a scalable and customizable web application created for the purpose of issuing and managing peer evaluations -- eliminating the need for combing through and manually computing results from surveys. In order to facilitate a near-infinite set of group configurations, EvaluRate has defined the 'unit' as the base unit of organization. Units can have users attached to them as members, Administrators to manage them, projects to attach evaluations to, and sub-units beneath them with the same properties -- effectively allowing hierarchical structures to be created. Permissions 'bubble down' by default, enabling top-level unit-admins to inspect and manage all child-units in a granular way but also allowing the delegation of administration duties to other users. Using this method to provide structure, one could model numerous different organizations, from the classroom to corporate environments and even stand-alone teams.

Green, Ashley
Faculty mentor: Omar Badreddin

Afternoon, 3:10pm-3:30pm, Skydome Stage D
Title: Visualizing Big Data with D3
This study initially began by obtaining a large data set gathered from a project at the Flagstaff Medical Center coordinated by Dr. Omar Badreddin and fellow colleagues. The project involved monitoring of
smart hand sanitizers that collect data on when they were used, who used them, and at which location. This data was visualized using D3.js. D3.js was created by Mike Bostock and colleagues (whose code bases were used as a reference in this project). D3.js, Data Driven Documents, is a library of the JavaScript language. The performance to which people are accustomed is still at the center, but D3.js is adapted into the Data Object Model and various web standards. The core strength of D3.js lies within the customization ability and building advanced visualizations based on vector graphics. Specific to our project, the user is able to select how they wish to view the data. They are able to view by individual user, month, and year. This allows for the elimination of data that may not be pertinent to what the user is wanting to view. It also creates a clean layout so many elements may be viewed in a simplistic sense. The conclusion of the project aims to evaluate the importance and method of visualizing big data for easier interpretation as well as discovery.

**Greenwood, Caleb**  
**Faculty mentor:** Becky Butcher

**Session I, 9:00am-11:00am, 122D**  
**Title:** Resurrection Belief and Judaism  
The present paper will offer a literature review of the scholarship on the event of resurrection of Jesus, to understand how such an event was likely viewed in antiquity. “Resurrection” has many colloquial meanings presently, from feelings of the heart, to visions, to physical bodily resurrection. Each of these different definitions has unique effects on the interpretation and implications of the resurrection event, and the plausibility of inciting the subsequent Christian movement. It requires consideration of the language used in Judaism, both in the Christian scriptures and precursory Jewish writings, to understand the event as it may have been understood in its own time period.

**Greyeyes, Angeleeta**  
Hannah Peterson, Michelle Samson  
**Faculty mentor:** Jay Sutliffe

**Session I, 9:00am-11:00am, 112D**  
**Title:** Hypertension Reduction and Cognition Improvement in a Senior Assisted Living Community using Wii Fit  
We are working with is the seniors at Brookdale Assisted Living Community. Using games on the Wii, we plan on educating the residents on hypertension. Studies have proven that using the Wii improves senior citizens' athleticism and memory. The Wii fit has been a success because the level of exercise can be adjusted from high intensity to low. Our target audience is the elderly population due to them having a higher risk for hypertension. By implementing this intervention, we can help promote hypertension awareness within the community, improve memory of residents, and level of physical activity. We will assess the residents' blood pressure, level of cognition and athleticism at the beginning and at the end of the intervention in order to evaluate their progress.

**Griffin, Allison**  
**Faculty mentor:** Scot Raab

**Session I, 9:00am-11:00am, 121A**
Title: Assessing Personality Types of Students in Athletic Training Programs

Context: Assessing personalities, using the NEO-FFI-3, of students admitted to Athletic Training Programs (ATP) has not been established. Furthermore, evaluation of potential differences in personality traits between successful and unsuccessful students has not been explored. Identifying NEO-FFI-3 traits correlated to ATP student outcomes may result in academic interventions, improving student success and retention. Objective: To establish the mean NEO-FFI-3 scores of students admitted to ATPs. Assess if differences exist in NEO-FFI-3 scores between successful students (retained in ATP or passed the BOC Exam) and non-successful students (released from the ATP).

Patients or Participants: The survey link was followed by 58 participants that had been admitted to an ATP with an expected graduation date between 2009 and 2016. Thirteen were eliminated for failure to sign the online informed consent or complete the NEO-FFI-3 in accordance with the instructions. The remaining 45 participants were used in the final analysis for this study (42 successful, 3 unsuccessful, 16 males, 29 females, age = 25±4.4 years). Interventions: Participants completed an online IRB consent form. Following consent they provided their sex, age, university, ethnicity, socioeconomic status, and ATP success. Then they completed an online version of the NEO-FFI-3 Personality Assessment (coefficient alphas = .78 to .86). It is a 60-question assessment of the five domains of personality traits: neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness (C). Main Outcome Measures: The mean scores for N, E, O, A, and C, then significant differences between the mean scores of successful and non-successful students. A 1-Way ANOVA was used to evaluate the significance of any differences between the two groups. Results: The mean scores for all students admitted to an ATP were: N: 21.47±8.17, E: 32.98±6.64, O: 28.87±5.41, A: 32.56±6.58, and C: 35.04±5.40. No significant differences were found between the successful and non-successful students on the scores of N, E, O, and C. However, a statistically significant difference was found between successful (33.12±6.29) and unsuccessful students (24.67±6.43) in agreeableness (F=5.05, p=.030). The composite personality showed students were average in N, O, A, and C while high in E. The unsuccessful students were low in A. Conclusions: In this sample, successful ATP students scored significantly higher on agreeableness than non-successful students. It is noteworthy that only three non-successful students completed the assessment and this may significantly impact the meaningfulness of the outcomes. Further research is warranted to fully understand the possible correlation that exists between personality traits and ATP success.

Griffin, Jill
Jill Griffin, Anna Robertson, Kellie Garrett, Suzanne Daiss
Faculty mentor: Suzanne Daiss

Session II, 2:00pm-4:00pm, 75C

Title: Electronic Technology and the Effects of Sleep Quality in College Students

The current study focuses on the relationship between electronic technology use before and during sleep and college student sleep quality. Researchers assess undergraduate students attending a rural university (n = 200) with an established subscale of the Pittsburgh Sleep Quality Index along with closed-ended questions about technology usage. It is predicted that there will be a negative correlation between sleep quality and electronic use before sleep. Recognizing the link between sleep quality and electronic usage among undergraduate students is valuable in health promotion programs across campuses.
Griffin, Lindsey  
**Faculty mentor:** Melissa Santana, Darwin Mann

**Session II, 2:00pm-4:00pm, 50C**

**Title: Farm to Table- Restaurant Design for a Healthier Generation**

The purpose of my research was to find an effective and improved way of developing and designing a restaurant in a pre-existing space. Located in Napa, California, the historic Borreo Building sits on a riverfront and has a long history of owners and occupants. This historical building has been vacant for almost 20 years and is a fantastic site for a new and exciting dining experience. The restaurant will cater to all generations, but will have a focus on the ever-growing millennial population. Research shows that millennials respond positively to branding and technology. It has been found that millennials commit the largest portion of their food expenditures to food away from home. Because of this, their generation is very important to the restaurant industry and has played a part in the design of The Borreo. Research shows that millennials care more about food being fresh, less processed and with fewer artificial ingredients. This directly correlates to the design and feel of the restaurant because it needs to represent the food and service. Open, airy spaces with lots of light have been directly associated with fresh food and organic farming because they share similar characteristics. Because of this, the environment of the Borreo restaurant has been designed to cater to the ever-growing millennial generation. Soft, light colors and crisp textures will enhance the 'fresh' feeling of the space and promote the desire for healthy and farm fresh foods.

Griffith, Josie  
**Faculty mentor:** Amber Nicole Pfannenstiel

**Midday, 11:30am-12:30pm, Skydome East Concourse - ADA section**

**Title: Women and Media: The Concern on Role Models, Celebrity, and Gossip**

In this presentation, I will be discussing the idea of role models, the feminist ideology, and the ways in which we as a culture are making sense of these kinds of things as well as the ways in which technology and social media sites have started to affect these kinds of ideas. Another thing I will be concentrating on is the ways in which my blog posts have started to shape my own scope of these really big ideas and through the writing of these posts as well as the reading in which I completed, I was able to start to shape opinions about female role models, as the media’s role.

Griner, Kirsi  
**Faculty mentor:** Christopher Jocks

**Session II, 2:00pm-4:00pm, 68A**

**Title: Consent of Native American Women**

The research I am focusing on is the sexual abuse and consent for Native American women. I would like to be able to teach them more about consent and show teach on how they can be more safe in their own home.

Gross, Joseph  
**Faculty mentor:** Britton Shepardson
Session II, 2:00pm-4:00pm, 58B

**Title: Evolution of Weapons**
This poster is on the evolution of weapons in Europe and Asia from the Stone Age to the Iron Age.

**Gross, Matthew**
**Faculty mentor:** Britton Shepardson

Session I, 9:00am-11:00am, 58C

**Title: Archaeology of Weapons and Warfare in the Middle East (10,000 BCE - 1000 CE)**
The presentation of this research serves to focus both on the development of weaponry and other remains found at various archaeological sites in the Middle East. The presentation also serves to highlight how warfare and particularly prominent warfare served to influence a city's architecture in early and later times. Furthermore how the threat of warfare may have led to more specialization or a greater lack of diversity in these populations diets. The purpose of this project serves to educate and offer a broader understanding of historical conflict in the Middle East region, and to enhance understandings of how the region developed as a result of these factors beyond the context of modern geopolitical concerns.

**Groves, Jacinth**
**Faculty mentor:** Brandy Judson

Session II, 2:00pm-4:00pm, 98C

**Title: Nutrition Behavioral Change**
My study the nutrition behavioral change is my journey towards a healthy lifestyle. Throughout this study the audience will be able to see before and after pictures from when I first started until the finish date. I have documented everything I have eaten and all of what I gave up. I created a log of when I go to the gym and for how many hours. The goal is to see if changing my bad diet habits helped me get in control of my lifestyle and get rid of bad habits.

**Gruntorad, Kelsey**
**Faculty mentor:** Francis Smiley

Session II, 2:00pm-4:00pm, 58C

**Title: The Ethnography and Archaeology of Hunter-Gatherer Societies in Tropical Environments: The Ache of Paraguay**
This poster presents a visual and textual examination of the material and archaeological correlates of the ethnographically known Ache society of South America. Archaeologists can learn a great deal about past civilizations by closely examining the material record of the Ache and other living societies. The Ache are a hunting and gathering band society of the tropical forests of Paraguay. The Ache inhabit a concentrated area of low mountain ranges, where they hunt and gather local resources for self-subsistence. The Ache are bands that move daily, unless heavy rainfall occurs and avoid interaction with any outsiders. Despite the fact the Ache produce a range of organic goods and hunt and gather persistently, I predict that the material correlates survivability in the archaeological record will be scarce. The purpose of this presentation is to set out a model of the kinds of material cultural
items produced by the Ache, given the social organizational and other cultural factors that govern the operation of that society. The poster also presents examples of archaeological research on similar societies to compare and contrast archaeological realities with the ethnographically derived model.

Grunwald, Jonathan
Stephan Ramos, Catherine Propper
Faculty mentor: Catherine Propper

Session II, 2:00pm-4:00pm, 31A
Title: Uranium's effect on estrogen sensitive genes in early embryonic Danio rerio.
Uranium (U) is one of the heaviest naturally occurring elements. It has been used for multiple applications like colorant, nuclear power, and atomic weaponry. U is found naturally within rocks and groundwater [4]. Exposure to naturally occurring U has shown to be harmful and affect multiple organ systems. In recent studies, it has shown evidence that it may mimic estrogen [4]. In this study, we tested the hypothesis that uranium can act as an environmental estrogen. In order to properly test this hypothesis, we utilized the developmental model Danio rerio (48hpf). Exposure of uranium included concentrations of 0ppb, 3ppb, 30ppb, and 300ppb. An estrogen positive control, ethinyl estradiol, was also utilized for comparative analysis (0.1ppb). Uranium came in the form of uranyl nitrate and was dosed relative to molecular weight. Each concentration employed 3-4 replicates with 25 larvae per. Exposure lasted 96 hours with water changes daily. Pictures were taken before and after exposure and analyzed for differences in length. Significance was found within the 30ppb and 300ppb (U) when compared to the control, suggesting that uranium may be affecting estrogen sensitive tissues. To further study the effects of uranium, we will utilize PCR to examine alterations to gene expression in the estrogen sensitive genes: cyp19b, ers1, and vtg1. We expect to see an upregulation in these genes, within the dosed organisms.

Guan, Xueyang
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 38D
Title: The economic impact of Bottled water in UNITED STATES
The central theme of this paper is the economic impacts of the bottled water in US. From large cities to small towns, the U.S. bottled water industry is a critical component of our nation's economy and infrastructure. Over the past decade, the per capita consumption of bottled water in the United States has more than doubled. With this increase have come several concerns, raised by public interest groups in recent years, over bottled water industries' economic impacts. I will lay emphasis on the comparison and contrast of bottled water's benefits and costs on this paper.

Guerrero, Alexis
Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 98D
Title: How to deal with Stress Positively
I have not been dealing with my stress in a positive way so I plan on going to the gym instead of binge eating. I plan to track my progress over the next semester to see how well I can do this. I am not going
to cut out snacking completely I am going to choose the healthier choices instead of eating junk food. Working out is a great way to self-care and it is a lot better than watching Netflix when I am bored. I will keep track by putting an x on doing the gym every day and eating healthy at least twice a day on a chart that I will create.

Guevara, Addison  
**Faculty mentor:** Michael Amundson  
**Afternoon, 2:45pm-3:00pm, Liberal Arts (Bldg #18) Room 120**  
**Title: Documenting the Unknown: Analyzing Lewis and Clark as Naturalists**  
This research will analyze the roles of Captains Meriwether Lewis and William Clark as naturalists, and products of the Enlightenment through the documentation of the natural world. Using primary sources in the form of written journal entries and drawings throughout the expedition from 1803-1806, this research highlights specific interactions with flora and fauna and analyzes how these instances shaped Lewis and Clark as naturalists and products of Thomas Jefferson's Enlightenment ideals. This work will also highlight the methodology of a naturalist, and the ability to study and gain understanding of the biological world by describing animals, taking live samples, preserving animals, and analyzing soil quality and makeup. Although there is extensive research on the Lewis and Clark expedition, there is space for more analysis of the expedition through an environmental lense. Utilizing both primary and secondary sources, my goal is to interpret the scientific observations made by Lewis and Clark in order to garner knowledge as to how they understood and interacted with their environment as they tackled unknown territory across the Western United States.

Gullion, Robert  
**Faculty mentor:** Stefanie Kuntz  
**Session II, 2:00pm-4:00pm, 68D**  
**Title: Availability of Energy**  
The fear of a global blackout could happen in the future. Finding viable resources to conserve energy whether its with automobiles or the use of products is something we need to spend more research on.

Gura, Autumn  
Sloane Olbricht, Ashleigh Holst, Kyle Caley, Thorin Fash  
**Faculty mentor:** Nora Dunbar  
**Session I, 9:00am-11:00am, 75B**  
**Title: Gender and Moral Decision Making**  
The goal of this study is to examine the potential impacts of gender and religiosity on moral decision making; specifically, through the trolley problem. This study surveys Northern Arizona University psychology students during their scheduled class times. We will pass out survey packets that include background questions (gender, age, and religious affiliation), four preliminary questions, and four trolley problems. We will analyze the data utilizing a Likert scale and further examine that data with a factorial ANOVA. We hypothesize that there will be an impact on moral decision making based on participants' gender and religiosity; as well as, the interaction between the two independent variables.
We would expect that women would answer more deontological, whereas men will answer more utilitarian. Furthermore, women who are religious affiliated will likely answer the most deontological.

Gutierrez, Evanne  
**Faculty mentor:** Amber Nicole Pfannenstiel  
**Morning, 10:30am-11:30am, Skydome East Concourse - ADA section**  
**Title:** Gamifying Freshman Composition  
Gamification, or the implementation of game-like elements into non-game settings, is one way that educators have begun to revolutionize the way students are taught. For this presentation, I will be exemplifying different ways freshman composition classes can be gamified and how such changes can have a positive impact on student engagement and learning.

Gutierrez, Lupita  
**Faculty mentor:** Britton Shepardson  
**Session I, 9:00am-11:00am, 58D**  
**Title:** Archeology of written systems  
My poster that I will be displaying in the symposium will be about the Archeology of Written Systems and the way I will set it up as is a timeline describing the events in which the writings were discovered as well as how it progressed throughout time.

Hall, Ashley  
**Faculty mentor:** Brandy Judson  
**Session II, 2:00pm-4:00pm, 98D**  
**Title:** Behavior Change of Personal Fitness  
I am trying to implement a workout routine into my life. I need to build a routine that I will actually partake in, and not become burnt out early on, before it becomes routine. I will be attempting to push myself to work out for ten minutes a day. This is easy enough to do, so it should be a lot easier to implement. I will be testing what the American Psychological Association says is the best way of implementing a workout routine into your life.

Hall, Connor  
**Faculty mentor:** Nicholas Moskovitz  
**Session I, 9:00am-11:00am, 10D**  
**Title:** Finding Fireballs: The Lowell Observatory Cameras for All-Sky Meteor Survey  
The Lowell Observatory Cameras for All-sky Meteor Survey (LOCAMS) is a low cost system for monitoring the night sky for incoming meteors. Using off-the-shelf components and existing software, the LOCAMS team is developing weatherproof, reliable, low-cost, autonomous camera stations for observing transient events in the night sky. The LOCAMS system is designed to image bright meteor 'fireballs' as they enter the atmosphere, but can also detect fainter meteors to a brightness of approximately 6th magnitude. Currently, two LOCAMS stations have been assembled: one at the Discovery Channel Telescope and one on the Slipher Building at Lowell Observatory. The current
goal is to begin the process of calibrating the stations so that they can accurately and reliably track the positions of objects as they enter the Earth's atmosphere. The next goal will be to develop operating procedures to provide a standardized instruction set for any future stations that may be constructed. Moving forward, we hope to use the data gathered by the LOCAMS stations to learn about the frequency of meteorite impacts, capture any significant fireball events, and hopefully to mount a successful recovery of any objects large enough to reach the ground. Eventually, these and future LOCAMS stations will be integrated into the larger Cameras for All-sky Meteor Survey network to increase our knowledge of what impacts the earth on a day-to-day basis.

Hall, Kelly  
**Faculty mentor:** Marie Baker-Ohler

**Session II, 2:00pm-4:00pm, 83C**

**Title: # Ferguson - The Impact of Social Media**

On August 9, 2014, gunfire rang out in Ferguson, Missouri. Michael Brown, an unarmed black man, had been shot and killed by a white Ferguson police officer. The events that unfolded after the grand jury did not indict Officer Darren Wilson for the shooting death of Michael Brown, brought civil unrest to the citizens of Ferguson, and worldwide. The distorted media coverage added to the protesters' unrest. Inaccurate reports from mainstream media were streamed through social media, fueling further protests around the country. It is the goal of this project to illuminate the role social media plays in reporting news stories. Using the story of Ferguson as a case study, this project highlights how social media drastically structures and frames the way the world views issues, especially in times of crisis or catastrophe.

Hall, Matt  
**Faculty mentor:** No mentor provided

**Session II, 2:00pm-4:00pm, 58D**

**Title: Symbiotic Relationship between Canines and Humans**

I would like to do my project on the prehistory of the domestication of animals. Dogs appear to be the first animals to be domesticated, and this was about 12,000 years ago. The symbiotic relationship between canines and humans came from early humans nurturing of wolves which are the ancestors of the domestic dog. I plan to further research the relationship between canines and humans and display my findings on a poster at the symposium in April.

Halliday, Ben  
Paola Felipe  
**Faculty mentor:** Will Cordeiro

**Afternoon, 1:15pm-2:00pm, Skydome Stage C**

**Title: Global Interpretations of Gender Identities**

This Powerpoint presentation will look at the transgender phenomenon in non-Western cultures, using interdisciplinary perspectives. We will look at such third-gender identities as Two-Spirits in Indigenous American cultures, Fa'aafafine in Samoan culture, and Kathoey in Thai culture. We will compare these cultures' gender identities with gender identities and transgender issues in the West.
Harrington, Mary  
**Faculty mentor:** Robyn Martin, Barbara Youngs

**Session II, 2:00pm-4:00pm, 105B**

**Title: Rare but Important**

The medical field has the power to save lives, but do not provide the appropriate recognition and funding for all diseases. Americans are now so focused on prominent diseases such as cancer, that the general population does not concern themselves with other equally dangerous illnesses. Primary Sclerosing Cholangitis (PSC) is a liver disease that is among those diseases routinely ignored. At first glance, the illness PSC may seem completely inconsequential because of its low-profile reputation, however, this disease is becoming more common, and its effects are life threatening. All diseases deserve proportionate medical funding because everyone deserves a better chance at life. Additionally, I will use a poster presentation to describe this disease to the audience. I chose this topic because I know someone with this disease.

Harris, Anna  
**Faculty mentor:** Melissa Birkett, Lucas Klein

**Session II, 2:00pm-4:00pm, 130D**

**Title: Myth of Subliminal Messages**

My poster will be discussing the research done to show that neither auditory or visual subliminal messaging works and it will be debunking the myth that it does. There will be discussion of studies on subliminal messages used to change choices, behavior and to persuade people. Another part included will be the discussion of a study done to show the effects of mellow or frenetic music on the impact of subliminal messaging. All of these studies have evidence that supports subliminal messaging has no effects on choice, behavior or persuasion but the music pace (mellow or frenetic) may have yielded different results for studies supporting this myth.

Harris, Dillon  
Holly Fash, Ryan Kittredge, Kolton Leasure, McKenzie Durtschi  
**Faculty mentor:** Lisa Tichavsky

**Session I, 9:00am-11:00am, 103C**

**Title: Lawful Firearm Carry at NAU**

The purpose of this study is to investigate student perceptions of lawful firearm carry on the NAU campus. We also seek to determine levels of student support for Arizona House Bill 2072 which would allow the lawful carry of firearms on campuses. Methods: We surveyed students of varying academic disciplines at a mid-sized university in the Southwest. The surveys were distributed in a manner that encourages student responses and anonymity. We utilize OLS regression to test the hypothesis that older students, and students who are more familiar with firearms, will be more likely to support the lawful carry of firearms on campus. The results and conclusions of this survey are in development but will be provided. Implications for policy will be discussed.

Harris, Hadley
Title: The Prehistory of Art in Europe

In this project, I will be discussing the prehistory of art in Europe. I will go into the detail of the type of art that was created and the techniques that were used. I will also go into further detail to explain how the art techniques used in prehistory are still used today.

Harris, Hannah
   Carlene Sachs
   Faculty mentor: Sumner Sydeman

Title: The Social Aspects of Cognitive Remediation Therapy for Schizophrenia: A Systematic Review and Meta-analysis

Objective: There have been numerous studies that have examined the efficacy of Cognitive Remediation therapy for Schizophrenia in psychotherapy clinical trials. In those studies, there have been few that have focused on the social aspects of CRT. In this project, a systematic literature review and meta-analysis will be conducted to evaluate the research evidence on the social aspects of CRT for Schizophrenia. A meta-analysis and a systematic review are studies that are used to check the effectiveness of therapies in clinical trials. Method: PubMed and PsyINFO will be searched in format with the best practice standards, following the PRISMA statement protocols, for randomized control trials (RCT) along with non-randomized control trials (non-RCT). Results: First, all of the methodologies and result sections that fall within the inclusion criteria will be reviewed and summarized. Next, for the meta-analysis, the effect size for each clinical trial will be calculated. Then the overall effect size will be calculated. These will be conducted using the statistical program, Comprehensive Meta-Analysis (CMA), Version 3. Conclusion: In this Meta-analysis, the key findings will be summarized and with suggestions for future research. Strengths and limitations of the published clinical trials will be noted as well.

Harrow, Rachel
   Russell Benford, Valerie Horncastle, Nashelly Meneses, Carol Chambers
   Faculty mentor: Russell Benford, Carol Chambers, Valerie Horncastle, Nashelly Meneses

Title: A method for assessing presence of the endangered New Mexico meadow jumping mouse

Recovery efforts for the New Mexico meadow jumping mouse (Zapus hudsonius luteus) require reliable detection and valid estimation of population size. Traditional live capture methods are expensive and risk mortality. In this study, we developed a method for determining the presence of the species. We tested four track plate designs, obtained prints from co-occurring rodents (jumping mice; 3 Microtus spp., voles; 2 Peromyscus spp., deer mice), and developed a field guide for identification of these species. To test the effectiveness of track plates, we compared capture rate and detectability to live capture at 9 sites. Results suggest that a modified plastic shoebox is the best design. Jumping mouse tracks are unique and easily distinguishable from sympatric rodents. Capture rate does not differ but detectability is higher with track plates. Our study shows that track plates have advantages
over live capture. Track plates do not allow species identification beyond genus, identification of individuals, nor the collection of demographic data. However, track plates may be used to collect tissue samples for genetic analysis. Track plates can be an effective tool for monitoring populations, researching behavior, and pursuing recovery objectives.

Hart, Ashlee
Lauren Kalt, Eva Marino, Emily Haworth, Samantha Watkins, Thuy Tran, Aubrial Harrington
Faculty mentor: Anne Scott

Afternoon, 3:00pm-4:00pm, Skydome Stage B
Title: Civic Engagement through Environmental Education, Thrift Stores, and Diversity Awareness
Seven students in Dr. Scott's Honors Course on Civic Engagement (HON 394) contributed their volunteer time to three organizations: Willow Bend Education Center, Full Circle Trade, and NAU's Multi-Cultural Center. Through their service learning at these three organizations, the students came to understand how such organizations work, what their nature and function are, the needs that these organizations have hoped to address, and the gifts that these organizations have provided for their communities. Students will present the context for their service learning, facets of the local as well as national issues involving environmental education, thrift store commerce, and diversity advocacy, as well as proposals for enhancing the mission and goals of such programs.

Hartin, Mariah
Crystal Rodriguez
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 81C
Title: The Impact of CBT on Self-Injurious Behaviors in Children: A Systematic Review and Meta-Analysis
Objective: The impact of Cognitive- Behavioral Therapy (CBT) on Self-injurious behavior in children has been examined in recent psychotherapy clinical trials. This poster will display the results of a systematic literature review (SLR) and quantitative-meta-analysis to evaluate the research evidence on CBT as it affects children who are self-injurious. SLRs and meta-analyses are important in the clinical psychology field because they combine data from various studies on one topic and create a viable conclusion. Method: CBT and it's relation to self-injurious behaviors in children will be researched using the electronic databases: PsycINFO and PubMed. These searches will be searched in a manner consistent with best practice standards for randomized controlled trials and nonrandomized controlled trials (Prefered Reporting Items for Systematic Reviews and Meta-Analysis protocols: PRISMA-P; Shamseer et.al., 2015). Results: Methodology and results of located clinical trials that meet inclusion criteria will be reviewed and summarized. Following this, the meta-analysis will be calculated. This will be done by calculating the effect size for each clinical trials. Then, an overall effect size statistic will be calculated for all of the trails. All of these statistical analyses will be conducted using the statistical program, Comprehensive Meta-Analysis (CMA) software, Version 3. Conclusion: Within the poster the key findings of the systematic review and meta-analysis will be summarized, the strengths and limitation of the published clinical trials will be noted, and suggestions for future research will be offered.
Angry Art: How Engagement and Quiet Ego Play a Role in Mood Repair

Previous studies suggest that art-making can serve as a type of mood repair by heightening engagement, happiness, enthusiasm, overall well-being and life satisfaction (Collier and von Karolyi, 2014; Collins, Sarkisian, & Winner, 2009; Drake and Winner, 2012). Activity engagement involves an intense focus, which allows a person the opportunity to reduce extraneous thoughts and experience focused attention. Once in this state, the individual can become fully involved in an activity, which brings its own rewarding and therapeutic outcomes (Csikszentmihalyi, 1997, Collier and von KaÄrolyi, 2014, Collins, Sarkisian, & Winner, 2009). We wanted to see if engagement and creativity could be enhanced during art-making and mood repair after art-making, by 'priming' people with an activity called Quiet Ego Contemplation (QEC). The QEC is a 4-minute audio that is designed to remind participants of the four quiet ego characteristics: detached awareness, inclusive identity, perspective taking and growth (Bauer and Wayment, 2008). Previous research has indicated that listening to this brief QEC recording reduces egoistic self-focus and dampens stress response (Wayment, Collier, Birkett, Traustadottir, Till, & Birkett, 2015). We hypothesized that positive mood, creativity, and engagement would increase when participants listened to a QEC recording before making art, compared to those who did not listen to the recording. Participants came to the laboratory and were instructed to recall an upsetting event that occurred in the past, then were randomly assigned to either the QEC prime art-making condition (n=25) or no QEC prime art-making condition (n=25).

The Process of Tribal Recognition

There are 566 federally recognized tribes in the United States, and nearly as many unrecognized by the United States who are petitioning to be recognized. Two hundred and thirty of the unrecognized have never been formally acknowledged by the government. I will compare and contrast the struggles associated with not being federally recognized in terms of what benefits and protection they may and may not receive to what federally recognized tribes receive. I will also stress the struggles non-recognized tribes have to endure in the twenty first century as well as the process it takes to becoming acknowledged and what it takes to remain recognized.

A Return to the Delta: Perspectives on Human Involvement with Colorado River Restoration through Creative Representation
Over the past few decades, the human tax on the Colorado River has increased considerably in conjunction with the American Southwest's growth in both its population and demand for water. As a result, the river, which once reached all the way to the Gulf of California, barely makes it to Mexico. This human use of the Colorado River has thus led to a drastic change in the make-up of the Colorado River Delta region in Mexico, which was once a complex system of estuaries and terrestrial ecosystems. The wetlands, now, face extreme depletion and the area has seen a drastic change in its aquatic ecosystems. As part of an Honors class in 2015, The Colorado River and the West, we studied the human impact on the Colorado River through various mediums of news articles, documentaries, and scholarly work. We then traveled to the Colorado River Delta in Yuma, Arizona and Sonora, Mexico in order to work with restoration groups to plant trees and restore the wetland's natural habitat. In 2016, we returned as Honors independent study students to observe the progress that has occurred in these areas over the past year. This time, we have taken a primarily creative approach to our study of the delta through photography and creative non-fiction writing. Through our creative projects, we hope to effectively convey the importance of human involvement in restoration in an accessible manner, our experiences with the river, and our understanding of its cultural significance in Yuma and Mexico.

Hayes, Alexander
Faculty mentor: Margaret Dunfee

Session II, 2:00pm-4:00pm, 43D
Title: Social Business Revolution
For years, many businesses have taken advantage of consumers through unethical practices, including advertising deception, environmental destruction, price gouging, and others. Now that consumers are connected like never before, companies can no longer effectively cover-up sketchy business practices. Because of this, consumers are increasingly getting frustrated with businesses, and for good reason. The Social Business Revolution (SBR) is the solution to the problem of unethical business practices. It changes the focus from maximizing profit to the people. The SBR instead views money as a hurdle and truly focuses on making life better for all stakeholders, including consumers, customers, clients, employees, and owners. The problem with businesses is their responsibility for returning investment back to its stockholders/owners; but through the use of the modern technology of crowdsourcing, the public can now be the owners of the company. An SBR company is distinctive in two ways: it is funded by consumers and ruled under the golden rule: treat others the way you want to be treated. Under the golden rule, the company focuses on minimizing or eliminating negative externalities, creating products/services its creators would want, treating employees well, and being a nonprofit company. A nonprofit company means that all its profits are reinvested in the company or given to social causes.

Hayes, Kacie
Faculty mentor: Christine Lemley

Morning, 9:30am-9:55am, Skydome Roundtable R3
Title: Teaching Young Minds through the Arts and Cultural Interactions
This research project focuses on helping people build an understanding of art and language by bridging the gap between the two subjects. They will do so through the use of literacy (ex: vocab.), interacting with technology, learning the history of a culture, and through the development of social and political
skills. Throughout this presentation, there will be discussions about how art has had an impact on cultures and language in both the past and present. People will further engage in the topic by discussing how art has affected things such as historical events, how societies have formed and changed over time because of art, and how it has affected certain individuals (i.e. famous artists). Through collaborative discussions, people will build a better understanding of what inequities exist throughout the world and why. Through this presentation, I will also be teaching people how to respect and appreciate different forms of art.

Hazelman, Joni
Parker Montfort, Robert Voinescu, Ryan Wood
Faculty mentor: Dana Ernst

Session I, 9:00am-11:00am, 12B

Title: Nim-values of Simplified Sylver Coinage
Sylver Coinage is a game in which two players, A and B, alternately name positive integers that are not the sum of nonnegative multiples of previously named integers. The person who names 1 is the loser! This seemingly innocent game is the subject of one of John Conway's open problems. We will discuss a simplified version of the game in which a fixed positive integer n (greater than 1) is agreed upon in advance. Then A and B alternately name positive integers from the set \{1, 2, \ldots, n\} that are not linear combinations with positive coefficients of previously named numbers. As in the original game, the person who is forced to name 1 is the loser. We will investigate who wins under optimal play for given values of n and determine the nim-values for the simplified game under certain conditions.

Henderson, Dane
Faculty mentor: Greg Vaughan

Session II, 2:00pm-4:00pm, 13C

Title: Using Satellite Remote Sensing to Study the Birth and Fate of a New Volcanic Island
From December 19, 2014 to January 26, 2015, an island-forming, or surtseyan, eruption occurred between the islands of Hunga Ha'apai and Hunga Tonga in the Kingdom of Tonga, a volcanic archipelago in the southwest Pacific Ocean. The islands that form from such eruptions are sometimes only temporary, as the loose volcanic material can be eroded within months. Using satellite remote sensing data from before, during, and after the eruption, from the Landsat 8 and the Advanced Spaceborne Thermal Emission and Reflection Radiometer instruments, changes in the size of the island were monitored. The new land mass grew to 2098 square meters by January 22, 2015 and eventually connected the two pre-existing islands. The data were also used to document the recovery of the vegetation on the pre-existing islands that had been buried or damaged by volcanic tephra and acidic gases from the eruption. The normalized difference vegetation index, derived from the remote sensing data, indicated that the vegetation on both islands was damaged or buried by January 22, 2015, but returned to Hunga Tonga by March 27, 2015, and Hunga Ha'apai by April 12, 2015. As of March 10, 2016 (14 months after the eruption stopped) the new island is still there, outlasting predictions that it would have eroded back to sea level within a few months.

Henderson, Greg
Faculty mentor: Francis Smiley
**Session II, 2:00pm-4:00pm, 59A**

**Title: The Saami of Scandinavia: The Archaeological Correlates of a Pastoralist Society**

The poster presents a visual and textual examination of the material culture and record of the ethnographically known Saami society of Northern Scandinavia. Archaeologists can learn a great deal about prehistoric societies by closely examining the material records of living societies. The Saami are a semi nomadic pastoralist society in the arid tundra of Northern Scandinavia. The Saami herd and migrate with reindeer, which are used in nearly all aspects of life such as transportation, tool making, food, clothing, and are part of their symbolic behavior. Since the Saami make a wide variety of materials and both temporary and permanent structures for reindeer herding practices, I predict the future archaeological record will be quite extensive, largely due to the arid environment which preserves organic materials well. Although due to their mobile lifestyle, evidence may be difficult to locate. The purpose of the presentation is to create a model of the material cultural items produced by the Saami society with regards to pastoralism, environment and other cultural factors. The poster also presents examples of archaeological research on similar societies to compare the derived model of Saami culture to archaeological reality.

Henderson, Krista
Wendy Lu
**Faculty mentor:** Sumner Sydeman

**Session II, 2:00pm-4:00pm, 81A**

**Title: Cognitive Behavioral Therapy for Schizophrenia in Asian Cultures: A Systematic Review and Meta-Analysis**

The efficacy of Cognitive Behavioral Therapy for Schizophrenia has been examined in recent psychotherapy trials, some specifically focusing on those of Asian descent. The purpose of the this project was to conduct a systematic literature review and quantitative meta-analysis to evaluate the research evidence in order to quantify the effect of Cognitive Behavioral Therapy on symptoms of Schizophrenia. It is important to verify that Cognitive Behavioral Therapy is an accurate treatment for individuals with Schizophrenia, because ethnic minorities are typically left out of conducted trials. The method used was an electronic database search including PsycINFO and PubMed as search engines: the search searched for randomized controlled trials (RCTs) spanning from 2000 to 2016 where Cognitive Behavioral Therapy was compared to a control condition. Methodology and results of located clinical trials will be calculated. Then, an overall effect size statistic was calculated for all trials. These statistical analyses were conducted using the statistical program Comprehensive Meta-Analysis (CMA) software, Version 3. Key findings of the systematic review and the meta-analysis will be summarized, strengths and limitations of any included clinical trials will be made note of, and suggestions for future research considering Asian descendants and culture will be offered.

Henley, Sarah
Danielle Butler, Nickolas Owen
**Faculty mentor:** Rebecca Maniglia

**Session II, 2:00pm-4:00pm, 103C**

**Title: The Modern Day Ghetto and Hip-Hop Reflected in Broadway's “Hamilton”**
The Grammy award winning Broadway musical 'Hamilton' has grown to be one of the most well-known musicals in recent months. The show explores the life of Founding Father Alexander Hamilton from his voyage to America through to his death. The show contains Broadway's usual extraordinary acting and unique costumes, but what sets 'Hamilton' apart from other musicals is its use of hip-hop as its dominant musical genre. But why was the genre of hip-hop chosen as the major form of music in 'Hamilton'? This project explores the resemblances of the modern ghetto in which hip-hop has its roots to Hamilton's life and story in order to understand why 'Hamilton's' creator, Lin-Manuel Miranda, was motivated to use the genre of hip-hop in the show. Furthermore, we examine the way in which Hamilton's use of words, which reflects modern-day hip-hop, are used to create change, and how today's hip-hop can influence change and revolution as well.

Hensel, Scott
Heather Casares
Faculty mentor: Nancy Riggs

Session I, 9:00am-11:00am, 13B
Title: The Evolution of the Cordilleran Arc and the Application of Zircon Geochronology
The Cordilleran continental arc began forming 250 million years ago above a subduction zone, when the Pacific plate sank underneath the Laurentian plate causing magmatism along the western margin of North America. The arc is currently exposed in eastern California and southern Nevada and was active between ~250 and 65 million years ago. The chronological and chemical records of the evolution of this arc through time are incomplete due to the arc not being fully uncovered, as well as some parts having been eroded. Some of the arc material was deposited in southern Utah ~77-74 million years ago by means of river transport and volcanic ash fall deposits - (bentonite). This area is now known as the sedimentary Kaiparowits Formation. Zircons can be used to record the chemical composition of magmatic arcs at their time of formation by their accumulation of trace elements. These elements can be compared to other zircons in the arc to gain a broader, more comprehensive understanding of its geochemical changes through time. Analyzing the trace element geochemistry is also used to determine the provenance of the detrital zircons and bentonites found in the Kaiparowits, and therefore what part of the arc was active at the time of deposition. This will help refine the history and geochemistry of the Cordilleran arc.

Heritage, Teresa
Faculty mentor: Marie Baker-Ohler

Session I, 9:00am-11:00am, 86B
Title: The Cost Of Time Travel
We Time travel when we leave our body in the present moment and travel to our past to relive our regrets, and travel to the future to live out our worries. We spend over 14 years of our life time traveling. In this project, I look at the effects of loosing our power in the present moment in our conversations and relationships due to time traveling. The opportunities and relationships we loose are the cost of time traveling.

Herring, Julian
Will Cross, Samantha Kruse, Thomas Haden, Stephanie Hurst
**Faculty mentor:** Stephanie Hurst

**Session I, 9:00am-11:00am, 22C**

**Title:** Large and affected by charge: Synthesis and analysis of a series of binaphthoquinone (BNQ) compounds  

Catalysts are of significant interest in industrial chemistry, and the need for new catalysts is of great concern. Some of the most useful catalysts for a variety of chemical syntheses are those with palladium. These catalysts are useful in hydrogenation, dehydrogenation, carbon-carbon bond formation, and other important common reactions. My research has been the syntheses of organic molecules with quinone-based structures which possess strategically placed pi bonds. These specific sites allow for palladium binding, and we can then begin to study these molecules as potential catalysts. One small variation on a molecule can greatly influence its structure-property relationship. By modifying the halide substituent on these systems, we can modulate electron density, and ultimately, the properties of potential metal-center catalysts. An advantage of the molecular series being characterized is the simple synthesis. Often, multiple reactions are required for the synthesis of complex molecules such as those being researched. In this case, though, the synthesis is a straightforward, one-pot reaction that results in a good yielding product. This product can then go on to make sandwich complexes, a common catalyst motif, with palladium and other catalytic metals. The properties of these sandwich complexes can then be analyzed and compared with currently available palladium catalysts. In this research, I synthesized and characterized halide substituted aryl-5H-dibenzo[b,i]xanthene-5,7,12,14-(13H)-tetraones (binaphthoquinones or BNQ derivatives). By using various analytical techniques, I compared the series to understand the effect of each halogen substitution. Understanding the properties of each new compound is important for developing new industrial catalysts.

**Higdon, Duane**

**Faculty mentor:** Christopher Jocks, AIS Department

**Session I, 9:00am-11:00am, 68B**

**Title:** Business Capitalization On Indigenous Land  

The United States strives on small businesses and capitalization since the beginning of the forming nation. As profitable businesses expanded were expanding there was a different story on the Indigenous people's lands. Native Americans were trading long before the westerners from Europe arrived. Since the beginning indigenous peoples traded with neighboring tribes near them and they traded various goods such as food, tools, and furs. This was the beginning of business deals for indigenous peoples, but once they encountered people from the 'New World' they did not know anything about the norm business processes the foreigners were running. Indigenous peoples have come a long way since 1492 in a great amount of subjects. Native Americans have fallen behind from the progressive Western culture because the traumatic events that took precedent on the people of the indigenous nations, such as relocation on to reservations. Tribal reservations are nowhere near as technologically advanced or have a huge of a population as the major cities throughout the nation. The subject I want to discuss is the businesses of goods and services on the Navajo Nation, which is located in Northern Arizona and extends into the four corners. I want to discuss and analyze the history and why there are so few businesses on the Navajo Nation.
Hill, Conor  
Austin Mason-Burrows, LaTisha Gilmore, Diera Mickens, Conor Hill  
**Faculty mentor:** Lisa Tichavsky

Session I, 9:00am-11:00am, 103D  
**Title:** The Media's Influence on Police Perceptions  
The purpose of this study is to investigate how the media skews the influence of police officers on the average American. This project will be using the Cultivation Theory to measure the effects that televised media has on American viewers. We expect that an increase in exposure to negative media on the police will be associated with lower perceptions of police officers. Within this study we surveyed one hundred college students at a mid-sized southwestern university. We asked students about their police perceptions, media exposure and past experiences with police. We utilize OLS regression to test the results from the survey about police perceptions. The results and conclusions of the study are in progress but will be provided.

Hirschi, Madison  
McKayla Bradley, Jayden Capilla, Gavin Koivisto, Erin Brown  
**Faculty mentor:** Jamie Clem

Session I, 9:00am-11:00am, 97D  
**Title:** Stress In Correlation to Responsibility  
Five students conducted a survey of a small population of Northern Arizona University. Within this survey were questions aimed at acquiring a person's stress level according to their level of responsibilities.

Hitchcock, Kelsey  
**Faculty mentor:** Gretchen Gee

Session II, 2:00pm-4:00pm, 91A  
**Title:** Islamic Feminism and its Global affects.  
Globalization has allowed for the spread of feminism and, through this, the development of feminist movements and ideals within the religion of Islam. Many of those who have adopted Islamic feminism live in areas where women are largely oppressed and are using Islamic feminism to seek equality within their society. The spreading and acceptance of feminism in Islamic regions will lead to the empowerment of women, which will in turn lead to more women in places of power and politics, involved in academics and research, developing new technologies, and greater female involvement in the economic sector. As there always has been, it is likely there will be backlash from many who would feel threatened by the women's rights movement. However, on a global scale, having more women involved in these places will lead to more international interaction and potentially more peaceful interaction. As far as international interaction, having women involved politically would better their home countries’ economies, their relations with other countries.

Hoegh, Gia  
Tatiana Rasic, Danielle Dlugajczyk, Colt Solberg, Katie Saline, Jenna Chaffeur, Jarrod Chaplin  
**Faculty mentor:** Will Cordeiro
Morning, 11:00am-11:30am, Skydome Roundtable R1

Title: Trans-Feminism and Contemporary Media Representations of Women
This roundtable will discuss issues at the intersection of transgender studies and feminism, especially in regard to the way women are portrayed in media today.

Holden, Mark
Faculty mentor: Jeremy LaBuff

Afternoon, 3:00pm-3:15pm, Liberal Arts (Bldg #18) Room 120

Title: Persian Ethnicity During the Achaemenid Period
The following examination attempts to determine the attributes and origins of the Persian ethnic identity. This study is limited to the time period from approximately 1000 to 465 B.C, encompassing the early Persian migrations and the early Achaemenid Persian Empire. The evidence observed includes inscriptions, reliefs, architecture, and ancient records from both Persian and contemporary societies. This study challenges the usefulness of the word 'Persian' prior to the reign of the Achaemenid monarch, Darius I. The Persians only attained an ethnic consciousness during the reign of Darius I. Prior to his reign, I argue that an Elamite political identity and an Aryan linguistic-cultural identity existed among Persians. The later Persian identity grew out of these associations as well as common cultural characteristics shared among the several Persian tribes. I argue that the Persian ethnic identity included both elite and lower social classes and members of different tribal groups. Through close examination of the evidence, I conclude that the political development of the empire led to the growth of a Persian ethnic identity.

Holditch, Sarah
Faculty mentor: John Hultgren

Session II, 2:00pm-4:00pm, 21A

Title: Environmental Justice: Recognizing Animals as Moral Agents
The modern relationship between humans and non-human animals is currently dominated by an anthropocentric perspective. This assumes that human beings are superior to non-human animals and explains some of the hostility and often, lack of compassion towards animals. Within the legal system, animals are generally cast aside, while issues of injustice deal only with rights given strictly to humans. Reasons for this are based on the premise that animals lack moral understanding, rationality, and the ability to feel pain to the degree that humans do. My argument is that these are inadequate assumptions, built on fallacies and faulty reasoning, stemming from certain philosophical ideas that are outdated and due for reevaluation. My research project reviews these philosophical ideas and uses the fictional film, Watership Down, to analyze their applicability to contemporary life. The film, based on the book, 'Watership Down' written by Richard Adams, contains a profound message about the sophistication of animal society that suggests animals have a much higher level of rationality than humans have previously assumed. Although the film was meant to entertain and captivate the imaginations of young children, it presents an idea that is becoming more prevalent as humans come to understand the complexity of non-human animals. My argument will work to critically analyze the philosophical thought that has shaped the human-animal relationship and to provide some suggestions
to support a more inclusive environmental ethic that includes legal and moral recognition of non-human animals.

Holditch, Zane
Faculty mentor: Aaron Smith

Session I, 9:00am-11:00am, 34B
Title: Competitive outcome in Tribolium spp. is determined by priority
We tested whether priority effects influence the outcome of competitions between two common species of flour beetle (Coleoptera: Tenebrionidae): Tribolium castaneum and Tribolium confusum. Flour beetles provide a classic model for studying the competitive exclusion principle, which states that competitive interactions among species sharing an ecological niche will inhibit long-term coexistence. Competitive ability is thought to be intrinsic to a species, largely owing to life history characteristics adapted for securing limited resources. However, most studies examine competition between species introduced synchronously, which, in nature, is unlikely to occur during the colonization of an area. To find out if priority effects, or the timing of colonization, confer advantages to competing Tribolium species, we manipulated the sequence in which species were introduced to a competitive arena, and documented monthly population fluctuations. We noted two major patterns: (1) priority effects significantly determined competitive outcome, wherein species arriving to an arena two weeks earlier consistently became dominant, and (2) introduced synchronously, T. castaneum populations grew at the expense of T. confusum, which is contrary to previous research describing superior competitive abilities in T. confusum. Our results suggest that life history traits may not be essential to the outcome of competitive interactions, but instead depend upon priority sequence as one of potentially many factors.

Holgate, Renaldo
Faculty mentor: David Weber, T.S. Amer, Lisa Hewes

Afternoon, 2:00pm-4:00pm, Skydome FCB Table
Title: DRWH Education towards Learning
To speak truthfully, a majority of college students desire to reduce the exhausting hours of unwanted, stressful, and unsympathetic studying; even though that is a part of the college aspect. With a number of students that struggle with college studying, this particular idea would improve of how students can study more efficiently and determined. It involves virtual reality learning. This is not a video recording; it is a virtual reality headset. This headset is designed to help students reenact a lecture given that exact day and the exact questions that they asked during that exact lesson. The professor will explain exactly how he answered their question; including the exact gestures of how the professor was teaching them that particular day. They also have the options of choosing the exact places of where to sit during the reenactment of the current lecture. This headset involves the Media Richness Theory, that the richest and best way to learn is person to person learning. The lowest is textbook reading. This headset is also set toward the Recall theory, that people recall things more efficiently when they visit the exact same spot prior to where they've learned it. With this headset, students will continuously reenact the particular day of lecture, and will develop more specific questions for their professor; and also to absorb all the current lecture information. With other options and devices that
are included in this current headset, it could revolutionize the entire education industry and possibility the future of learning.

Hollinger, Gabrielle  
**Faculty mentor:** Amber Nicole Pfannenstiel

**Morning, 9:30am-10:30am, Skydome East Concourse - ADA section**  
**Title:** A Meme Discussion of the Kardashian Clan  
This will be a multimedia meme presentation concerning the Kardashian sphere of discourse.

Hollingshead, Brandon  
Jacob Dottle, Mark Kolwyck  
**Faculty mentor:** Richard Fleishman, Ashely DeBoard

**Session I, 9:00am-11:00am, 21D**  
**Title:** Communicating Forest Restoration  
The 4 Forest Restoration Initiative is a comprehensive and collaborative forest management plan aimed at restoring 2.4 million acres of National Forest in Northern Arizona through the use of techniques such as prescribed burning and thinning of trees, in response to decades of fire suppression. Our consulting group is working to highlight the needs of local logging enterprises to create a source of revenue that can stimulate local economies, as well as engage the public in forest restoration education to facilitate 4FRIs overall success. Transportation, allegations of breach of contracts, use of unwanted timber, and other issues are preventing a smooth, and timely execution of the restoration project. The objective of our consulting group is to create a cohesive and unbiased approach to communication between stakeholders and the public. In order to accomplish this, improvement of communication, and public awareness needed to be established. Tabling sessions were held to educate locals on current events with 4FRI, as well as evaluating the public perception of this restoration effort, further examining what areas need to be addressed. The eventual outcomes that the team hopes to accomplish include providing a pipeline for information to easily be transferred between parties and to inform the public, such as accessible stakeholder meetings. Moreover, this information will be analyzed to eliminate any misconceptions and ambiguity that could result in false claims that may hinder stakeholder interdependency and operational continuity. Finally, to also provide an atmosphere that enables companies to maximize economic efficiency and incentivize the use of unwanted timber.

Holloway, Sierra  
Maya Huffman, Skyler Quinn, Fahad Alyatama, Mohammed Almousawi  
**Faculty mentor:** Mark Lamer

**Afternoon, 2:40pm-3:05pm, duBois Marshall Room**  
**Title:** Sinclair Wash Riparian Habitat Enhancement Feasibility Study  
The purpose of this capstone project is to provide a feasibility study to the City of Flagstaff to restore and enhance critical areas of Sinclair Wash. Sinclair Wash is located in Flagstaff, Arizona, with tributaries beginning west of the Mountain Dell neighborhood. It travels northeast past Walmart, through the Northern Arizona University campus, and past Lone Tree Road where it drains into the Rio de Flag. Sinclair Wash has been subject to heavy flooding in years past, and as a result of this, has
lost some of its original function. Our engineering team is working to assess the problematic areas along Sinclair Wash, and design alternatives for restoration. The scope of our work includes stream reach determination, surveying, geomorphic assessment, hydrology, hydraulic analysis, engineering software use, riparian habitat assessment, low impact development, impact analysis, and the proposal of design alternatives. The Sinclair Wash project consists of meeting with a technical adviser, the City of Flagstaff Stormwater Manager, and other stakeholders. Our team will develop a 50% design report, a 100% design report, a project website, and give a final presentation upon completion of our engineering work. The broader interest of the Sinclair Wash project is to enhance the City of Flagstaff as a whole. With improved performance of the wash, the city can focus on aesthetically enhancing the surrounding area and providing the public with educational signage of the ecological and functional designs of the wash. The impacts of our work on Sinclair Wash will involve the economy, the environment, the surrounding community, and the overall health of the stream and patrons using it. Our scope of work will include a broader impacts analysis of short-term and long-term effects of our proposed designs in order to suggest the best possible alterations to Sinclair Wash.

**Hoogerwerf, Ellen**  
Lauren Bricker  
**Faculty mentor:** Liz Greenberg

**Session I, 9:00am-11:00am, 119B**

**Title:** **Nosocomial Infection Spread in Pediatrics**  
Nosocomial infections are spread in pediatrics through microbial organisms transferring from one object or toy to another, especially in the playroom. Our project examines the spread of these infections and what interventions can be applied in order to decrease this infection occurrence. Some recommendations that we have developed include disinfection of toys and playroom objects, as well as utilizing screening techniques to determine which patients can visit the playroom. Ultimately, the goal is for hospital-acquired infections in pediatrics to decrease significantly over time through the implementation and use of these interventions.

**Horton, Stephanie**  
Meghan Keller, Elaine Durcan  
**Faculty mentor:** Gerald Wood

**Session II, 2:00pm-4:00pm, 45B**

**Title:** **Service Dog Fraud**  
The purpose of our research will be to help reduce the number of fake service animals. First, we need to determine the definition of a service dog or service animal. This can be done with the use of ADA (The Americans with Disabilities Act). We will also try to determine how many pets are passed by as service dogs with the use of a fake vest or certification. This information may be hard to find, but having real numbers will assist us in our case. We will also determine the impact do fake service dogs have against the reputation of real service dogs. Testimonials from people with disabilities who have service animals and have been kicked out of businesses is also something we would like to include in the project. Our research question would be, how does the misuse of the ability to have a service dog affect people with disabilities? Our project is to create a presentation to present to middle school students and film the presentation. We hope to educate students on the purposes of service dogs and
hopefully have a physical dog there for demonstration. We also have a petition that aims to stop service dog fraud.

Hotman, Chloe  
**Faculty mentor:** Becky Butcher  

**Session I, 9:00am-11:00am, 125A**  
**Title:** *The Pros and Cons of Complete Integration of Females Into the Military*  
This report seeks to analyze the decision to completely integrate females into the military. Utilizing an interdisciplinary research approach, the pros and cons will be researched and presented. History, sociology, military studies, and gender studies will be the primary disciplines for analyzing the topic.

Howell, AJ  
Heather Moore, Jessica Harris, Christina Avila  
**Faculty mentor:** Jay Sutcliffe  

**Session I, 9:00am-11:00am, 113A**  
**Title:** *Healthy U at Thomas Elementary*  
Illness is one of the leading cause of absences among elementary students. The purpose of our program is to provide the students with the knowledge and resources needed in order to understand and improve their overall health hygiene practices.

Huetter, Sydney  
**Faculty mentor:** Anne Scott  

**Afternoon, 2:00pm-3:00pm, Skydome Stage A**  
**Title:** *The Other Half: Binaries and Others in Folklore across the World*  
Literature is often a window into society, and this paper explores the relationship between folklore and cultural outsiders in countries worldwide. Seven tales from five different cultures illustrate that the lives of literary 'Others' are located within the negative aspects of certain binaries: the poor instead of the rich, the disfigured instead of the beautiful and whole, and the minority instead of the majority. These binaries represent views of accepted norms and show how people divide the world into contrasting parts that categorize everything from nature to humankind. By understanding the way Others are outcast from the rest of society in folklore, the reader is able to perceive how these people are pushed aside in the modern world and how such treatment affects their behaviors.

Huff, Alexandra  
Justin Hagerty, Tenielle Gaither, Amber Gullikson  
**Faculty mentor:** Justin Hagerty  

**Session II, 2:00pm-4:00pm, 13A**  
**Title:** *Placing New Constraints on the Unexpectedly Complex Formation of Meteor Crater*  
Meteor Crater has been studied by the U.S. Geological Survey as the reference example of impact craters throughout our Solar System. Previous research of Meteor Crater's ejecta blanket show evidence of mixed iron and nickel abundances throughout its ejecta blanket, implying a complicated
Discerning the composition and distribution of iron, nickel, and other minerals within the ejecta blanket will aid further understanding and constraints on the formation processes of Meteor Crater. There are impact melt particles within Meteor Crater's ejecta blanket which contain pure iron and nickel metallic melt inclusions (MMIs). Using a secondary electron microscope (SEM), I studied the relative compositions of the MMIs and the glass and minerals surrounding them in order to understand the impacting processes behind Meteor Crater. The compositional data I have collected will serve as preliminary findings for further work to be done on specific areas of interest I have found.

Hughes, Brianna
Stella Elam
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 76B
Title: The Efficacy of Maudsley Family-Based Treatment for Anorexia Nervosa in Adolescents
Objective: The efficacy of Maudsley's Family-Based Treatment for Anorexia Nervosa in adolescents has been examined in recent psychotherapy clinical trials. In the current project, we intend to conduct a systematic literature review and quantitative meta-analysis in order to assess current research evidence to quantify the effect of Maudsley's Family-Based Treatment on symptoms of Anorexia Nervosa in adolescents. Systematic reviews and meta-analyses are needed to condense empirical data when researching a type of disorder or potential therapies. These studies allow clinicians, researchers and practitioners to view empirical evidence for a given treatment in an easy to access format. Method: Electronic databases including PsycINFO and PubMed will be searched in a manner which aligns with the best practice standards (Preferred Reporting Items for Systematic Reviews and Meta-Analysis protocols: PRISMA-P; Shamseer et al., 2015) for randomized controlled trials (RCTs) and non-randomized controlled trials (non-RCTs) in which Maudsley's Family-Based Treatment is compared to a control condition. Results: Methodology and results of collected relevant clinical trials will be studied and subsequently summarized. For the meta-analysis portion of the study, the effect size of each clinical trial will be determined. After this, an overall effect size statistic will be calculated for all collected trials. These statistical analyses will be conducted using the statistical program, Comprehensive Meta-Analysis (CMA) software, Version 3. Conclusion: Crucial findings of the systematic review and meta-analysis will be summarized, strengths and limitations of the included clinical trials will be noted, and suggestions for future research will be suggested.

Hughes, Phoebe
Faculty mentor: Julie Brown

Afternoon, 1:15pm-2:00pm, Skydome Stage A
Title: From Graphic Notation to Theatre Percussion: A Study of Percussion Ensemble Literature based upon Thierry De Meys Musique de Table
This project examines the influences of graphic notation on the development of percussion ensemble literature and the evolution of theatre percussion works in the twenty-first century. Exploring graphically notated compositions from the avant-guard, post World War II era of composers, this research shows how individual composers facilitated the creation of an ever developing sub-category of percussion ensemble music. Thierry De Mey's work, Musique de table, was published in 1987, in the midst of percussion ensemble literature containing more theatrical elements. Although De Mey is
not a well-known composer, the piece is a staple of percussion ensembles and chamber groups throughout the world. The notoriety of the work facilitates further research on graphic notation and theatrical percussion, as well as specific performance issues related to percussion and theatrical percussion. The quantity of chamber music for percussion has increased dramatically over the last sixty years, but the quantity of literature does not reflect the amount of scholarly research done within the genre. This project hopes to fill a gap for the ever-increasing area of compositional material and address the place Musique de table has in the historical context of chamber music for percussion.

**Hunsaker, Jason**

**Faculty mentor:** Stefanie Kunze

**Session II, 2:00pm-4:00pm, 68B**

**Title: Native American Sacred Land Disputes**

The project will be focusing on how the United States government is taking away sacred lands from the Native American tribes. I will also be discussing how the tribes are fighting to keep their land and how the loss of these sacred lands will affect how the tribes will conduct themselves politically. There will also be research into what the sacred lands mean to the tribes.

**Hutton, Ashley**

**Faculty mentor:** Jason Whetton, George Gumerman, Anne Scott

**Session II, 2:00pm-4:00pm, 76C**

**Title: The Journey to Self: Revisiting Maslow**

This project analyzed the top tier of Maslow's hierarchy of needs (self-actualization) and explored modern criticism regarding the inflexibility of this term. This project then dissected what Maslow's top tier means for humanity and dichotomized the self portion of self-actualization into identity and authenticity. By using research and theory by Jan Tannesvang and Charles Taylor as support, this project classified not one method of achieving self (referring to Maslow's self-actualization), but three methods of achieving self: self-actualization, self-fulfillment, and self-realization. Thus, this project concluded that humans strive to achieve the concept of self, and suggest that Maslow's hierarchy of needs not be topped off with self-actualization, but more broadly self-discovery, in which after completing all other levels of need one can endeavor the journey self-discovery by self-actualization, self-realization, and/or self-fulfillment.

**In, Jennifer**

**Faculty mentor:** Melissa Santana, Susan Marks

**Session I, 9:00am-11:00am, 52D**

**Title: Welfare and Vocational Skills Training Center for Adults with Autism Spectrum Disorder**

According to the Individuals with Disabilities Education Act (IDEA), Autism is a 'developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three that adversely affects a child's educational performance.' About 1 in 68 children are diagnosed with Autism Spectrum Disorder (ASD) and it occurs in all racial, ethnic, and socioeconomic groups. While society has become more aware of Autism over the years, most of the media attention on the disorder focuses on children and not adults. As years pass by, people seem to
forget that once those children grow up, they are still faced with the challenges of having Autism as adults. There are not a lot of resources or support programs for adults with Autism as educational services under the IDEA are cut off once the adult turns 21 or 22 years old depending on the state. While some effort has been made to support adults with ASD, offered programs often do not meet their needs and are difficult to fund. The purpose of this research is to provide a safe environment for adults with Autism to socialize and learn life skills to support themselves after high school. A welfare center offering vocational training will be designed in Honolulu, Hawaii and will implement a simple floorplan with easy navigation for people with ASD. The design of the space will incorporate elements of nature and will also include a small café employing adults with Autism to provide them with work experience.

Jachimowicz, Laura  
Faculty mentor: Brandy Judson

Session II, 2:00pm-4:00pm, 97D

Title: Implementation of Fresh Vegetables Into the Diet
Student studies the effect of increasing the use of fresh vegetables in the diet as a means of determining whether or not fresh vegetables will prove more beneficial than frozen or microwavable vegetables in the context of both physical and mental health. Methods: tracking of fresh vegetable servings in the daily diet and weekly reflections regarding physical and mental well-being, progression, and improvement.

Jager, Robert  
Carrie Bindschadler, Jonathan Salazar, Ning Suo, Zhilin Zhang, Hengyue Zhao, Robert Jager  
Faculty mentor: Xiaobing Zhao

Session II, 2:00pm-4:00pm, 39C

Title: The Detrimental Economic Effects of Zebra Mussels in the Great Lakes
Our project examines the detrimental economic effects that have arisen from the introduction of the zebra mussel to the Great Lakes in the United States. Zebra mussels are widely considered one of the most damaging invasive species ever introduced. Zebra mollusks are native to the Caspian Sea, but were transported to the Great Lakes in ballast water from a transoceanic vessel. Since their introduction, zebra mussels have spread rapidly through waterways, sometimes found even in the southeast and west of the nation. Zebra mussels subsist on phytoplankton, which has seriously affected the amount of phytoplankton that is available to other organisms. This loss in phytoplankton has led the water to become clearer, thus sunlight penetrates deeper, which in turn allows plants called macrophytes to grow; however, once these plants decay, they wash up on shorelines and damage the overall water quality and pollute the beaches. Further, Zebra mussels absorb pollution more easily than many other species and cause the native wildlife to be increasingly exposed to harmful contaminants. In addition, the zebra mussel population threatens the native mussels as they attach to the native species and smother them. Besides their devastating ecological impacts, the mollusks have also caused tremendous economic damage. They often clog the pipes of power plants, water treatment plants, and the engine cooling systems of boats. Attempts to eradicate zebra mussels have been largely unsuccessful due to the lack of cost-effective methods.
Jancys, Jayne  
Taryn Schreiner, Mariah Ashley  
Faculty mentor: Claire Martini, Angie Moline,

Session I, 9:00am-11:00am, 18A

Title: Addressing Climate Change Principles for Local Youth Empowerment: Uplift Climate Conference

The key to a better world is better advocacy. Uplift is youth-run organization whose mission is to involve, encourage and empower youth to address climate change on the Colorado Plateau. The Grand Canyon Trust in Flagstaff, Arizona organizes Uplift in order to connect young people to the environmental and social justice issues. Uplift hosts an annual conference that addresses and teaches the necessary tools for youth to be effective advocates of climate change in their home communities on the plateau. Uplift found that the 2015 climate conference lacked a lasting and distinct set of action-based principles for participants to share as a tool for advocacy and engagement. Our major objective was to assist Uplift by formulating an action-based Statement of Principles to be presented at the Second Annual Uplift Climate Conference in Summer 2016. To accomplish this objective we, 1) collaborated with Uplift, 2) researched principles of similar organizations and youth perspectives on climate change, and 3) framed a concise set of principles that addressed diversity, energy/mineral extraction, water, and land stewardship. Our product will be further revised and molded by the views of community members on the Colorado Plateau in order to create a locally-based and comprehensive statement of principles.

Jebens, Kaitlyn  
Madison Ledesma, Amanda Warda, Sara Sanford, Hannah Roberts, Alexander Ballesteros  
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 59B

Title: Te Mata Ki Te Rangi (Eyes Toward the Heavens) - Toponyms of Easter Island

The poster presents a visual and textual examination of the toponyms of Easter Island, Chile. A toponym is a place name derived from a topographical feature. The research done is an international collaboration with Rapa Nui high school students. The project has provided the students with the opportunity to become involved with the history of their island. The work is done with the help of a non-profit, Terevaka Archaeological Outreach. The main objective of this project is to create an online, user-friendly, accessible database for both tourists and local people. Interested parties can scroll through sites on the island, read descriptions of the sites provided by multiple sources, and view photographs of sites. The goal of the project is to create an all-inclusive information database that preserves all information regarding Easter Island and provides easy access in one location. The end result will be information access for research, tourism, and learning opportunities.

Jiron, Shaelyn  
Faculty mentor: Gerald Wood

Afternoon, 3:00pm-3:25pm, Skydome Roundtable R1

Title: Homework: The Effects and Why It Needs to Be Rethought
Growing up, I remember there being a lot of arguments between my parents and us children about homework. Our parents would make sure we did our homework but there were fights about completing it, needing help, and not receiving the help we thought we needed. We had to finish our homework before we could play, before we could go to bed. Homework spurred more arguments than most other things. But I learned from it, did I not? I got better grades and did better on tests because of my homework, right? Maybe not. Based on my personal experiences with homework and the research I have conducted; homework is not helpful. In an attempt to get people rethinking the practice of assigning homework, I will be conducting a project for that purpose. The purpose of this project is to facilitate a discussion on the affects of homework. Parents, teachers, and students will be able to share their own personal experience with homework. The research I have found will be presented and discussion encouraged on how everyone feels about learning these facts. More meaningful homework practices will be presented as well. We can also consider everyone's opinions on implementing a no-homework policy and discuss the more meaningful homework techniques.

John, Sonya
Faculty mentor: Miguel Vasquez

Session II, 2:00pm-4:00pm, 59B

Title: Traditional Navajo Perspectives on Diabetes and its influences on Modern Medical Practices
The purpose of this research is to explore how traditional Navajo perspectives on diabetes influence the way that medical practices are conducted in the community. Since the introduction of western foods and lifestyle, the rates of diabetes have risen in the Navajo community. Diabetes in Western cultures is seen a disease that results from the body not producing enough or any insulin to breakdown sugars. The lack of insulin then leads to hyperglycemia, high blood sugar. In consequence, constant high blood sugar have affected the Navajo people substantially by becoming the leading cause of blindness and amputation. Despite Western influence, the Navajo do not view the causes of diabetes the same way. The Navajo believe in the concept Hozho, harmony and beauty. They see that there is a balance in the world and when that balance is disrupted, illness will prevail. They try to rectify the disease by participating in ceremonies that will put their bodies back into balance. The Navajo people see the concept of health in a gestalt fashion. Health to them does not only encompass physical health, but also mental and spiritual health. Their perspective is very different from the Western cultures. When the Navajo elders go into the hospitals, majority of them have difficulty communicating with their doctors. They do not describe the disease in ways that western doctors understand. There is not a mutual understanding. This research looks at how this perspective affects the way medicine is practiced and searches for methods for improvement.

Johnson, Averie
Faculty mentor: Jordan Williams, Jason Dorsch

Session II, 2:00pm-4:00pm, 33D

Title: A Comparison Between the Satisfaction and Effectiveness of Personal Training, Open Gym, and Group Fitness
The purpose of the study was to discover the satisfaction and effectiveness between 3 types of gym utilization formats. To measure satisfaction a survey was conducted at various gym facilities on three different gym utilization methods; open gym (OG), personal training (PT), and group fitness (GF). To
measure effectiveness, participants went through two exercise evaluations over a 6-week period. The exercise test covered either strength or endurance, along with a flexibility test. The two evaluations are then compared to each other to see what changes, if any, had occurred. Surveys were given to management at 5 gyms who then distributed it to their members. Surveys were then collected after a 2-week period. An ordinal scale was used to interpret 3 survey questions that would be used to help in the second part of the study. The 6-week exercise study held two fitness evaluations (initial and final) and consisted of measuring flexibility, along with either a strength or an endurance test. The results of this study show that clients who choose personal training over group fitness and open gym reported more satisfaction with their fitness results, more motivation to go to the gym, and more likely to recommend personal training to others.

Johnson, Chloe
Adriana Vosskuhler, Nora Dunbar
Faculty mentor: Nora Dunbar

Session I, 9:00am-11:00am, 75C
Title: The Impact of Social Media Use on Romantic Relationships
There has been little research done to specifically explore connections between social media use and romantic relationships. In this study, we examined the correlation between the frequency of social media use and romantic relationships among young adults. Data included the total minutes per day of time spent on all social media sites, as well as overall relationship satisfaction. A survey was used including both self report and the QRI questionnaire. Roughly 100 surveys were obtained. Relationship satisfaction was observed on three levels: depth, conflict management, and support. We analyzed results using the Pearson product-moment correlation r. We examined the degree of relationship between relationship satisfaction levels and the frequency of social media use. Although we have not analyzed results yet, we anticipate to observe a correlation between the two variables, signifying an interaction between social media use and romantic relationship satisfaction.

Johnson, Cody
Faculty mentor: Christopher Jocks

Session I, 9:00am-11:00am, 68C
Title: Central Arizona Project/Indigenous Research
My presentation will be a presentation on Indigenous Research and how it differs from western based research.

Johnson, Cody
Faculty mentor: Stefanie Kunze

Session II, 2:00pm-4:00pm, 68C
Title: Central Arizona Project
My project will be on the Central Arizona Project and how this project has effected tribal water rights. It will also discuss the stakeholders in the project and what are the benefits of this project.
Haley Passarella, Amanda Boelter, Jazmine Williams, Pasculita Quochytewa, Samantha Ratliff  
**Faculty mentor:** Jamie Clem

**Session I, 9:00am-11:00am, 96A**  
**Title:** Internships for Social Work Majors  
We created a survey to be distributed to class members and plan to use the results in order to answer our overall research question, should internships be required for Social Work majors?

**Jones, Amy**  
**Faculty mentor:** Gerald Wood, Meghan Remington

**Session II, 2:00pm-4:00pm, 48D**  
**Title:** University for You  
The purpose of this project was to make college more accessible and understandable to high school juniors and seniors. Working through an online community I have sought to see the needs of the students and how they can be met. I have worked with students one-on-one and in groups to discover the struggles keeping them from pursuing higher education and linking them with resources to help them achieve their goals. I have also worked to raise awareness among students and their parents of the importance of higher education and how it can be attained.

**Jones, Kylie**  
Lisa Persinger, Sara Abercrombie  
**Faculty mentor:** Lisa Persinger, Sara Abercrombie

**Session II, 2:00pm-4:00pm, 47B**  
**Title:** Gender Essentialist Thinking Among Students: The Role of Background and Academic Focus  
This presentation describes the conceptual background and initial data collection of a research study investigating the ways in which individuals from different backgrounds conceive of gender, and how gender conceptions might vary depending on personal characteristics. Gender essentialism is a type of categorical thinking, where individuals think of gender traits as stable, fixed, and unchanging, and research suggests that some individuals engage in more essentialist thinking compared to others (Smiler & Gelman, 2008). In this study, we are investigating whether background experiences, such as relationships with gender non-conforming individuals, as well as academic experiences, such as academic major or career goal, affects gender essentialist thinking. Data will be collected with graduate students using an online software collection program (Qualtrics), then analyzed to examine what characteristics predict essentialist thinking about gender. Then, follow up interviews will be conducted to further elucidate the results. This poster presentation will describe data collection procedures as well as analysis plans.

**Jong, Vincent**  
**Faculty mentor:** Gerald Wood

**Session I, 9:00am-11:00am, 45A**  
**Title:** The Presence of Bilingual Programs
This project is about the presence of bilingual programs. More specifically, it goes into depth about why bilingual programs have been eliminated and how bilingual programs have been able to navigate through political pressure. These subtopics are an important component to bilingual programs overall. People do not understand how important bilingual programs are for ELL students. Overall, this project shows how active bilingual programs are and how controversial it is politically.

**Jouflas, Brian**
Kaitlin Vandaveer, Matthew Rodgers, Logan Couch  
**Faculty mentor:** Mark Lamer, Thomas Nelson

**Morning, 9:20am-9:45am, duBois Marshall Room**  
**Title: 2016 ASCE Steel Bridge**  
The 2016 ASCE Steel Bridge Team has been given a fictional situation that requires us to design, analyze, fabricate, and construct a 1:10 scale model of a steel bridge used to replace bridges deemed deficient by the state of Impecunia. The Steel Bridge team will then go to Long Beach, California to compete in the ASCE Pacific Southwest Conference against a number of other schools in our region. All bridges will be constructed in a timed fashion with a maximum of 45 minutes allowed. If successful during construction the teams will then load their bridges with 1400 pounds in the center and 1000 pounds at an off-center location. Last, the bridge will also be loaded with a 50 pound lateral load.

**Joyce, Michael**  
**Faculty mentor:** Melissa Birkett, Lucas Klein

**Session II, 2:00pm-4:00pm, 129D**  
**Title: Tunes Behind the Wheel**  
Falling asleep behind the wheel is a very serious problem on the road. There are many alleged tricks to keep you wake and alert while driving, one of those being listening to loud music. This project looks at the research data related to music and driving to determine whether this myth is actually true or if it is just another driving distraction.

**Jumah, Lamia**  
**Faculty mentor:** Stefanie Kunze

**Session I, 9:00am-11:00am, 68D**  
**Title: Racism against American Indians**  
My topic will cover racism against native American-Indians. Despite the sayings that racism and discrimination was already abolished, the reality is that it was not. Majority of people, particularly those that belong to the minority class, are hugely affected by the parochialism which maintains the sovereignty and the ultimate power of Whites to rule all over other individuals in America. It is important for us to know and to understand how important this is in order for us to ensure that everyone has the same rights and privileges just like everybody else.

**Kallestewa, Erica**  
**Faculty mentor:** Christopher Jocks
Session I, 9:00am-11:00am, 69B

Title: Systems of Governance Through Time on the Hopi Reservation
An analysis of systems of governance on the Hopi Reservation throughout history in order to assess the pros and cons of each governing system. Each analysis will include an overview on the introduction of foreign governing systems and their results. Other factors will be included including health, economic development, and cultural practices.

Kalt, Lauren
Taryn Schreiner, Oli Wheeldon, Olivia Yuen, Sara Bogle
Faculty mentor: Bruce Aiken

Morning, 9:00am-11:00am, Skydome CAL Floor
Title: ART 497 exhibition
An exhibition in which ART 497 students will do oil painting demonstrations of art they are working on with the guidance of Bruce Aiken.

Kalt, Lauren
Taryn Schreiner, Oli Wheeldon, Olivia Yuen, Sara Bogle
Faculty mentor: Bruce Aiken

Afternoon, 2:00pm-4:00pm, Skydome CAL Floor
Title: ART 497 exhibition
An exhibition in which ART 497 students will do oil painting demonstrations of art they are working on with the guidance of Bruce Aiken.

Kamp, Rebekah
Faculty mentor: Julie Moreau

Session I, 9:00am-11:00am, 84D
Title: Healing and the Transmission of Affect
This project looks at the way affect theory can be applied to the analysis of the healing processes in western culture. Specifically, this study looks at the transmission of affect and how it can contribute to the healing process, and/or be the reason behind the necessity of healing. In the process of seeking out this topic, a specific question was in mind. Does the transmission of affect create a space for healing? There are many forms of emotional healing and this study analyzes them using affect theory. Teresa Brennan's book (2004), The Transmission of Affect, brings about the idea of 'feeling the atmosphere,' which is full of affects and emotions. The idea is that one can 'feel' the energy in a specific encounter with another energy source. Using this theoretical framework, this study works to uncover how 'feeling' energy can help in the emotional healing process, which is so necessary in our lives today.

Kane, Madelyn
Russell Benford, Nashelly Meneses
Faculty mentor: Russell Benford, Nashelly Meneses

Session I, 9:00am-11:00am, 26C
**Title: Risk of Arborviral Disease Transmission by Aedes aegypti in Central Arizona**

Mosquito-borne diseases (i.e. arboviruses) elicit public health concerns and account for over one million deaths annually. In recent years, the reported incidence and range of arboviruses including dengue (DENV), chikungunya (CHIKV), and zika (ZIKV) viruses have increased. Vaccines are unavailable, and preventative measures are limited to the management of vectors. A common vector, the yellow fever mosquito or Aedes aegypti, receives growing attention as it colonizes new areas such as Southern Arizona. Arizona health officials have initiated mosquito surveillance programs around the state, but not in all regions. The purpose of this study was to surveil a previously unmonitored high-risk area in Central AZ. Standard surveillance protocols were used. Adult mosquito traps (n=28) and oviposition traps (n=270) were set to determine presence and relative abundance of the vector, and to provide baseline data for subsequent monitoring. No adult A. aegypti mosquitoes were detected, but two confirmed A. aegypti eggs were found. These results indicate presence of the vector, suggest possible dispersal corridors, and reveal risk factors that could be managed and reduced in efforts to prevent transmission of arboviral diseases. Recommendations are made.

**Kanzler, Justin**  
Nicole Guardiola, Sabrina Leal  
**Faculty mentor:** Nancy Barron, Chase Edwards, Claire Seel  

**Midday, 11:30am-12:30pm, Skydome East Concourse - ADA section**

**Title: How the Students Behind the University Writing Commons Apply Bitzer to Resource Development, Academics, and Daily Life**

During the 2015-2016 school year the University Writing Commons student team used Lloyd Bitzer's 'The Rhetorical Situation' to create resources for the Commons. Rhetorical theory soon enveloped our lives, and we began using it in our academic studies, social lives, and in our work with the UWC. The goal for our resource development is to show other students how they, too, can apply rhetorical theory to their academic, professional, and social lives. This project will showcase YouTube videos, blog posts, and interviews about our experiences using what we learned from 'The Rhetorical Situation.' Our goal is for students from across campus to use the resources we have developed and learn from our process how to apply rhetorical theory in their lives and in their daily struggles.

**Kaplan, John**  
**Faculty mentor:** Richard Hofstetter

**Session II, 2:00pm-4:00pm, 16C**

**Title: Potential Viability of Biopesticide for Managing Bark Beetles in Forest Ecosystems**

Biological insecticides, or bioinsecticides, are becoming increasingly popular due to their aptitude for killing target species and their relative harmlessness to non-targeted organisms. Beauveria bassiana, an asexually reproducing fungus, has already been successfully used in agricultural settings. I assessed the efficacy of B. bassiana for managing aggressive bark beetle populations in forest ecosystems. I tested the effectiveness of this fungus against bark beetles and its potential to protect healthy pine trees. Trees were placed into one of three treatments: an external spray of B. bassiana, an injection of B. bassiana, and a control group (with no B. bassiana). Mortality rates by the fungus were assessed on attacking beetles (parents) and their offspring. B. bassiana is a promising candidate for bark beetle control, and this project will support or denounce its viability as a biopesticide, whether sprayed or
injected, setting the stage for B. bassiana to potentially replace or complement current control methods.

**Katsuda, Leialoha**  
**Faculty mentor:** Christine Lemley

**Session II, 2:00pm-4:00pm, 51A**  
**Title:** Where are the Female Artists?  
'...the most influential galleries and museums exhibited almost no women artists' (Guerrilla Girls, 1995). Through culturally relevant pedagogy I will present a lesson that answers the question of 'where are the female artists?' This lesson will promote the importance of learning about female artists from various cultures, places, and times. In many art history classes, the same dead white men are discussed, but what about the women? It is critical for students to broaden their knowledge in the arts and be open to discussing gender equality. The lesson was created using the critical indigenous research methodologies, which include rationality, responsibility, respect, and reciprocity to engage students in a meaningful way.

**Kaufman, Dean**  
**Faculty mentor:** No mentor provided

**Session I, 9:00am-11:00am, 59C**  
**Title:** Yezidism and Genocide  
This poster will be about the Yazidis who are an ethnic group with their own religion called Yezidism. Yazidis are part of a larger ethnic group known as the Kurds who live in the region known as Kurdistan that encompasses Northern Iraq, Eastern Syria, Eastern Turkey and Western Iran. Kurds are different groups of people, but all share the same language. In recent years since the destabilization of Syria, ISIS has formed and persecuted many groups of people including the Yazidis. Since 2014, there has been an ongoing Yazidis genocide, for which ISIS is responsible. In this poster, I will be going into detail about Yezidism and why it has made the Yazidis a target for genocide. I will also discuss why the Sufi-Kurd neighbors of the Yazidis helped ISIS find and kill them. Last, I will discuss measures in progress to try to stop the violence to both the Yazidis and other minority groups within Kurdistan.

**Kee, Tisimpsha**  
**Faculty mentor:** Priscilla Sanderson, Roger Nosker

**Session I, 9:00am-11:00am, 113B**  
**Title:** Nanise' bee (both e s are high tone; Navajo Spelling) iina (both i s and the a are high tone) - Plants are Life  
Background: On the Navajo reservation, many Navajos eat above the USDA recommended serving for meat and below the USDA recommended serving for fruits and vegetables. A study that was conducted on the Navajo reservation on effective nutrition education for Navajo families revealed that 80% of the participants expressed interest in learning more about nutrition. The purpose of this project is to promote healthy food choices among the Tselani/Cottonwood chapter members, on the Navajo
reservation, by educating and providing them with some tools to eat healthier. Methods: A two hour workshop will be conducted focusing on various subjects in nutrition. The workshop will cover information about recommended servings for each food group, understanding food labels, and eating healthy when time and money are limited. The workshop will be conducted in May 2016. Results: The workshop has not yet been implemented. The expected results are to have the participants learn something new from the workshop. Once the details for this project are finalized, an evaluation form will be made to measure the effectiveness of the workshop. Conclusions: The intended outcome of this project is to have the participants learn how to use the tools and knowledge provided in the workshop. This workshop will be made available for other chapter houses to use for their chapter and community members.

Keetso, Jessica
Maxx Utter, William Churchill, John Begay, Jacques Seronde
Faculty mentor: Jacques Seronde, Ashley DeBoard

Session II, 2:00pm-4:00pm, 19D
Title: Developing Rainwater Catchment Manual for Navajo Nation
Water security has been an interesting concept for the Navajo Nation since the court case of Winters v. United States and more recently settlements like SB2109, and the Utah Water Settlement. At the grassroots level the Navajo people have been struggling to secure, protect and preserve their water rights and water resources. Northern Arizona University Environmental Senior Seminar class has volunteered their time and effort to help communities on the Navajo reservation continue this mission. The main goal of this collaboration is to assist the Lower Colorado River Watershed Association (LCRWCA) and the people living on the Navajo Nation to build partnerships, coordinate, plan, finance, implement, manage and evaluate their watershed system. Our objectives are: familiarize ourselves with the people and the watershed system, specifically the Dinnebito and Oraibi arroyos. Help draft a rainwater catchment system manual with the help and support, direction and guidance of the LCRWCA senior planners, steering committee members and community members. This manual will be a comprehensive outline of the water needs for the people, livestock and wildlife in rural communities. Implementing and installing free standing rainwater catchments with help facilitate and enhance biodiversity of wildlife, at the same time supporting the pastoral and farming needs of the people. Although watershed restoration will be an ongoing initiative that each community on the reservation will have to take responsibility for, the contributions from NAU students will lead to each chapter possessing essential information to start developing their own Natural Resource and Conservation Plans and provide an alternative means of harvesting and storing water.

Keil, Jordyn
Savanna Kessler
Faculty mentor: Gerald Wood

Session I, 9:00am-11:00am, 47C
Title: A Space to Escape in the College of Education
The purpose of this project is to create a space somewhere in the College of Education or elsewhere on the Northern Arizona University Mountain Campus so that students can have a space to relax and relieve the stress that is brought on by college and the academic pressure. Academics is not the only
stressor in a college students life so addressing the issue of too much work put on students would not be a sufficient purpose of this project. As two college students we understand that stress leads to lack of sleep and lack of sleep can cause more stress which creates a vicious cycle that is hard to break due to not enough hours in the day. When students feel stressed or sleep deprived they tend to turn to unhealthy aids that will temporarily fix these problems such as: drugs, alcohol, caffeine, and energy drinks. The purpose of this student break room is to provide students with a healthy way to reduce stress and sleep deprivation.

Kekaula, Chelsie
Colton McConnell, Brent Lipar, Emily Melkesian, Evan Kaichi
Faculty mentor: Mark Lamer, Thomas Nelson

Session II, 2:00pm-4:00pm, 7C
Title: NAU ASCE Concrete Canoe Capstone
The American Society of Civil Engineers (ASCE) annually hosts a National Concrete Canoe Competition (NCCC) in which engineering students have the opportunity to design, construct and race a concrete canoe. A group of five civil engineering capstone students constructed a canoe and competed at the ASCE Pacific Southwest Conference from March 31st through April 3rd. This competition requires task management, scheduling and budgeting, as well as hull design and analysis, concrete mix design, reinforcement use and construction. The hull design governs the canoe's ability to accelerate, maneuver, and provide stability. In addition, the canoe requires a concrete mix that is lightweight, high strength, and buoyant. Concrete inherently has high strength in compression, however it lacks tensile strength. To provide tensile strength to the canoe, the team implemented fiberglass reinforcement and a post-tensioning system. Lastly, construction was planned during the design process to assure that the plans were feasible and done correctly in the construction phase.

Kekaula, Chelsie
Colton McConnell, Brent Lipar, Emily Melkesian, Evan Kaichi
Faculty mentor: Mark Lamer, Thomas Nelson

Morning, 9:45am-10:10am, duBois Marshall Room
Title: NAU ASCE Concrete Canoe Capstone
The American Society of Civil Engineers (ASCE) annually hosts a National Concrete Canoe Competition (NCCC) in which engineering students have the opportunity to design, construct and race a concrete canoe. A group of five civil engineering capstone students constructed a canoe and competed at the ASCE Pacific Southwest Conference from March 31st through April 3rd. This competition requires task management, scheduling and budgeting, as well as hull design and analysis, concrete mix design, reinforcement use and construction. The hull design governs the canoe's ability to accelerate, maneuver, and provide stability. In addition, the canoe requires a concrete mix that is lightweight, high strength, and buoyant. Concrete inherently has high strength in compression, however it lacks tensile strength. To provide tensile strength to the canoe, the team implemented fiberglass reinforcement and a post-tensioning system. Lastly, construction was planned during the design process to assure that the plans were feasible and done correctly in the construction phase.

Kelly, Madison
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 59C**

**Title:** Archeology of Music in Europe

Music is a large part of society today and has a lot of influence on people. Examining the archeology of music in Europe we will see what types of instruments they used, and how music influenced parts of their society.

Kelly, Maura

Natalie Cravens, Kelly Ingram

**Faculty mentor:** Jay Sutliffe

**Session I, 9:00am-11:00am, 113C**

**Title:** Alcohol Awareness at Summit High School

We plan to implement an alcohol awareness program for our target population, a small health class of students grades 9-12. After distributing a survey, we found that about 77% of our target population had ever consumed alcohol. Our purpose is to reduce the incidences of underage drinking, specifically binge drinking, in these students. Through our program, students will learn about the dangers and risks associated with using and abusing alcohol and how these actions may have consequences later in life. We are going to administer a pre and post-test to evaluate comprehension of the material presented in our program.

Keltz, Ehren

**Faculty mentor:** Francis Smiley

**Session I, 9:00am-11:00am, 59D**

**Title:** What Will Remain? The Ethnoarchaeological Investigations into the Tiwi of Northern Australia: A Hunter-Gatherer Island Society.

This poster offers a visual and textual analysis of the material record of the ethnographically known Tiwi society of Northern Australia. Archaeologists continue to advance the understanding of prehistoric societies by closely analyzing the material records of living societies. The Tiwi are a hunting and gathering society of the Melville and Bathurst Islands, known collectively as the Tiwi Islands, in the Northern Territory of Australia. The Tiwi Islands are largely forested with eucalyptus and mangrove-lined streams with rocky coastlines that allow for an abundance of resources. Albeit the Tiwi manufacture a range of carved wooden products, other manufactured goods, build temporary dwellings, and hunt collectively, I predict that the attendant archaeological record has its limitations. This presentation is to provide a model of the kinds of material cultural items produced by the Tiwi given the social-organizational and other cultural factors that govern the operation of the Tiwi society. The poster also presents examples of archaeological research on analogous societies to compare archaeological reality with the ethnographically derived model.

Kerutis, Zachary

Janice Hakala, Allyson Kenna

**Faculty mentor:** Angie Moline, Taylor Joyal
**Session I, 9:00am-11:00am, 19C**

**Title: Sustainable Citizens Program Consulting Project**

This consulting project was created to assist the Sustainable Citizen Program develop into a program that aligning with the desires of students. The Sustainable Citizen Program, which is being run through the Office of Sustainability, was created in order to give every NAU student the opportunity to learn the basic science behind climate change and how to live a more sustainable life. Non-environmental majors are rarely exposed to climate science and sustainability and the Sustainable Citizen Program is a great alternative for students to educate themselves. Interested students will complete requirements to obtain a certificate in climate science and sustainability. The program has yet to be fully developed but there is a rough plan for the program requirements. In order to find improvements for the Sustainable Citizen Program, we will conduct focus group research with cross disciplinary students. We will then critically analyze the program curriculum and determine if the curriculum aligns with the interests of students. At the conclusion of our research, our consulting group will create a final report of our findings and will make recommendations for the program.

**Kessler, Ashley**  
Anna Robertson  
**Faculty mentor:** Sumner Sydeman

**Session II, 2:00pm-4:00pm, 77C**

**Title: Coping Cat for General Anxiety Disorder: A Systematic Review and Meta-Analysis**

Objective: There is immense preexisting research pertaining to general anxiety disorder (GAD) in children as treated by the program Coping Cat. Our team composed a systematic literature review and meta-analysis of the most recent controlled trials on children and adolescents with GAD to understand the long-term effectiveness of Coping Cat on children with the disorder. A meta-analysis serves to understand existing research and overall results of research on similar topics. Method: PsychINFO and PubMed, electronic databases, will be searched according to guidelines recommended by Shamseer et al. (2015). Results: Although not yet been obtained, positive effectiveness in children who receive Coping Cat treatment is anticipated, such that initial responses to treatment remain constant through time. Conclusion: The study applies to nearly all children with GAD symptoms and is thus generalizable to a large portion of the population.

**Keyonnne, Taelor**  
Emma Wilford, Amelia Videan  
**Faculty mentor:** Nora Dunbar

**Session I, 9:00am-11:00am, 75D**

**Title: #WhatsUpWithMyBoo?**

The goal of the research project is to find a relationship between depressive symptoms and the perceived quality of romantic relationships. We will be using the Center of Epidemiological Studies Depression Scale (CES-D) to measure depression and the Quality of Relationship Inventory (QRI) scale to measure the perceived quality of a romantic relationship. The purpose of this research study is to discover how strong the relationship is between depression and relationship quality among college students (18-24 years old). Several studies explored this relationship among married couples, engaged couples, and young adolescent partners. There is a limited amount of research concerning this topic on
college students. Therefore, this current study will explore the relationship between depression and romantic relationship quality among college students. Additionally, the objective is to gain insight on the association between depressive symptoms and romantic relationships involving college students. We expect to find a relationship between depression and the quality of romantic relationships.

Khan, Kristina
Haley Yarrington
Faculty mentor: Will Cordeiro

Session I, 9:00am-11:00am, 104C
Title: Transgender Television
Over the course of the past decade and a half, the media's spotlight has started to turn toward transgender people. This change has given rise to the popularity of transgender celebrities as well as transgender characters in fictional television shows. This project takes the form of a poster and attempts to determine television's view of transgender people by examining and comparing the treatment of transgender actors and actresses and fictional transgender characters. The typical roles that transgender actors and actresses get is explored. This project focuses on a few specific transgender actors and actresses and looks at the professions they are usually cast as having, be they prostitutes or lawyers, and how often they portray transgender versus cisgender characters. This is then compared to the data on fictional characters themselves. Like with the actors and actresses, the professions and roles that fictional transgender characters fill in television shows is examined, as will the way transgender characters are treated in television shows. Similarly, how often transgender characters are portrayed by transgender actors versus cisgender ones is discussed. By analyzing and comparing the results of these two focuses, we can determine that television's overall perception and portrayal of transgender people is negative; however, it is also improving. This is important because media shapes peoples' unconscious stereotypes of others, so negative portrayals create negative stereotypes toward transgender people.

Kilgore, Dorothy
Sean Flynn
Faculty mentor: Frederick Lampe, Britton Shepardson, Jeanne Schofer, Jeremy Haynes

Session II, 2:00pm-4:00pm, 59D
Title: Bringing Government Agencies into the Digital Age: Increasing Public Access to Knowledge within the Coconino County Forest Service
One problem within the United States Forest Service, Coconino County specifically, is an issue with disseminating information to the public yet not having the time or resources to do so. The webpage discussed within this poster would go a long way in fixing that divide. This poster provides a basis for an easy-to-use webpage for the public within the United States Forest service. It will provide information, images, and locations of archaeological sites, culture, trails, campgrounds, ecological and ethnographic data within the Coconino County forest in an easily accessible format that the public can understand and navigate. We will also examine how proficient this particular webpage design can be for the forest service and other types of agencies around the world.

King, Deborah
Faculty mentor: Brandy Judson

Session II, 2:00pm-4:00pm, 96A

Title: Steps towards becoming more organized.
Everyone has behavior patterns that they want to change. The first step is recognizing the unwanted behavior. The second step is to formulate an actual step by step behavior change plan that can be successfully implemented to accomplish the change. Our professor asked us to pick a behavior that we want to change. The first thing that came to mind is my habitual lack of organization which has been detrimental to my success in school and work. Habits are hard to break. We spend much of our lives living our habits so we cannot expect to change overnight, but with a plan, that has proven support of researchers, we can take baby steps to change and in time reach our goal.

Kirkov, Kiril

Faculty mentor: Rachel Tso

Session II, 2:00pm-4:00pm, 9A

Title: Stars for the Future
Abstract The purpose of the project was to explore the science of Astronomy and Planetology with Dine elementary students from the STAR School. The children integrated Dine culture and science regarding the Sun, Earth, Moon and planets. The main project goal was to compare and contrast between Navajo and western astronomy. The students developed skills as astronomers, astrophotographers and filmmakers. They designed and delivered astronomy presentations as evidence of learned content. They also produced a documentary film about their own experiences throughout the project. Main project activities were astronomy workshops at Coconino Community College and Lowell Observatory. The students demonstrated engagement and interest through their curiosity and inquiry, as well as their desire to learn new skills and participate in further scientific endeavors. We hope this project will instill an interest and desire in the students to pursue careers in NASA or related science fields.

Kirkov, Kiril

Amy Foust

Faculty mentor: Miguel Vasquez

Session I, 9:00am-11:00am, 60A

Title: Austrian Refugee Integration Project
In recent months, hundreds of thousands have fled their war-torn homelands to escape violence and bloodshed. Austria, like much of Europe, is facing the consequences of huge influx of refugees and migrants fleeing warfare and economic chaos in their homelands in the Middle East, Central and Northern Africa, and the Western Balkans. In Summer 2016, NAU Anthropology and AIS faculty and students will collaborate with Austrian refugee organizations in documenting, refining, and disseminating best integration practices. This would incorporate anthropological approaches to refugee integration training by providing: visual documentation of refugee support programs; refugee ethnographies; and workshops on Rapid Assessment, Response and Evaluation qualitative research skills to integration coaches. Main outcomes of the project would be producing series of short
documentary films, as well as photographic book with portraits of refugees, integration experts, and volunteers. The text of the book will be written in English, German, and Arabic.

Kitaoka, Lianne

Faculty mentor: Chris Johnson, John Gialanella, Giovanni Castillo

Session II, 2:00pm-4:00pm, 83D

Title: MyCoin University Pay
MyCoin University Pay is an app created for the Apple Watch. It would be a secure and safe nationally used app to replace university identification cards. The user will have their own chosen password for protection allowing building access, meal plans, university debit access, student health facilities, recreational facilities, etc. Exact function as university identification card but with hands-free ability, less likely to lose, and a more stylish and safer experience. Users will also receive notifications through the app about upcoming payments and campus events allowing user to have the full college experience. As well as having the ability to check bus routes/locations and check balance/funds for meal plans, university debit, and tuition. For each university, MyCoin will cater to the university personally and change the apps colors to associate the university enhancing the benefits of being a college student.

Kobasick, Carly

Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 96B

Title: Behavior Change
My project is about my behavior change over time, how i accomplished it, and what tactics let me to my end goal. My behavior change was to stop being on my phone so much and spending so much time on social media. My end goal is to spend a lot less time worrying about what's happening on social media, and spend more time with the people around me, and enjoying their company. I have been and is continuing to keep track of my progress throughout time and setting weekly goals for myself for how much time I am allowing myself to be on my phone in order to completely limit my phone usage.

Koehler, Krystal

Krystal Koehler, Anastasia White, Coretta Nolan, Thomas Linskey

Faculty mentor: Nora Dunbar

Session I, 9:00am-11:00am, 76A

Title: The Effects of Musical Tempo on Working Memory
The purpose of this experiment is to measure the effects of music on working memory recall. Memory is an important aspect of success in college and research. This experiment measured the effects of Bach's Prelude in C Major (soft paced) and Bach's Italian Concerto BWV 971 (fast paced) on memorization of words and number of words recalled in comparison to a silence control group. The data comes from the student sample drawn from the course, Psychology 302w and the corresponding lab sections. Results are expected that the soft paced group will retain recall more words accurately than the two other groups. It is expected that the results to show some effects, although insignificant,
between the two music groups. However, there is expected significant effects between the control
group and the group mean of the stimulus groups.

Koepppe, Lindsey
Jordan Buchhagen, Kelsie Howden
Faculty mentor: Mary (Liz) Greenberg, Kate Watkins

Session I, 9:00am-11:00am, 119C

Title: Bedside Report and Affect on Patient Safety and Satisfaction
Communication is a key part of nursing. Effective communication is a national safety goal, as
miscommunication is often a primary factor in healthcare sentinel events (Sand-Jecklin & Sherman,
2014). Patient handoff occurs during the change of the hospital shift or at any point that patient care is
being transferred. In a hospital setting, a significant amount of information is passed between nurses
when patient care is transitioned; and this transfer of information plays a role in ensuring hospitalized
patients' safety and satisfaction, as material could be lost or missed, even misinterpreted or
miscommunicated (Caims, Dudjak, Hoffmann, & Lorenz, 2013). Thus, effective and thorough report
is critical for providing quality patient care. The change of shift report can take place in a number of
ways including nurses meeting as a group or one-on-one at the nurse's station, but in general patients
and families are not part of the handoff process (Maxson, Derby, Wrobleski, & Foss, 2012). This
paper's authors will consider the possible impact on satisfaction and safety related to performing
change of shift report at the patient's bedside for the population of patients in the inpatient setting.

Kohen, Kaitlyn
Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 125B

Title: Plant Based Lifestyle vs. American Culture
In my project I am going to be talking about the American culture and how it is making its people very
sick through its recommended food choices. It is 2016 and we have more information now than ever,
especially when it comes to food. We know that eating a plant based diet is the healthiest option for
humans, however we are still teaching out children to consume meat and dairy products in school. I
hope to bring attention to this issue, because although we are a very powerful country, we are the
sickest and fattest.

Kopp, Alexandra
Faculty mentor: No mentor provided

Session II, 2:00pm-4:00pm, 96B

Title: Getting Better with my Eating Habits
During this semester, I wanting to change the way I eat. Eating three meals a day, not more eating junk
food, making sure that I Eat healthier and drinking more water. Then once I can get a handle on that
start to work out, little at first but then start doing more and more To be able to gain weight and keep
that weight on instead of losing it like I do now.

Krause, Korianne
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 60A

Title: Prehistory of Monumental Architecture in Europe
My project will be a poster that shows the prehistory of monumental architecture. I will show the architecture throughout ages in Europe. It will show how things have changed over time and the advances that have been made in architecture.

Kritz, Lara
Faculty mentor: Christine Lemley

Session II, 2:00pm-4:00pm, 44C

Title: Growing Student's Education: The impact of School Gardens
A garden is a grand teacher. It teaches patience and careful watchfulness; it teaches industry and thrift; above all it teaches entire trust' (Gertrude Jekyll). Which raises the question of how gardens educate students on self sustainability and responsibility? Analyzing the benefits of having a school community garden and how it positively impacts learning. Also, what lessons and responsibilities it teaches. Having a community garden crosses all the curriculum and grade levels. How can gardens educate students on self sustainability and responsibility?

Kruse, Samantha
Julian Herring, William Cross-Lopez
Faculty mentor: Stephanie Hurst

Session I, 9:00am-11:00am, 24B

Title: Heavy Metal for Migraines: Novel Phosphonium Ligands for Palladium-Based Sandwich Complexes
Palladium catalysts are still undergoing significant research for their use in important organic reactions. Phosphorous-based ligands have the ability to electronically tune these types of catalysts. Research has not yet been done on many bidentate phosphonium ligands, which has been my project since starting in Dr. Stephanie Hurst's research lab. I have synthesized several different ligands, whereby the reaction of tropylid and the desired phosphine yields a bidentate phosphonium system. These systems only differ in the bridge between the two phosphorous centers. I have also been reacting the new bidentate phosphonium complexes with palladium in order to form the desired sandwich complex. These compounds are able to chelate due to the eta bonding interactions phosphorous has with palladium. I have characterized both the precursors and the sandwich complexes using 1D nuclear magnetic resonance (NMR) as well as crystallography.

Kulpinski, Maisie
Jack Cavness, Sydnee Wickstrom
Faculty mentor: Frederick Lampe

Session I, 9:00am-11:00am, 60B

Title: Reclaimed Water on the Arizona Snowbowl: Cultural and Economic Impacts
This poster examines the cultural and economical impacts of the use of reclaimed water at the Arizona Snow Bowl in Flagstaff. We both recognize and argue that there are cultural and economic issues at play in using reclaimed water for recreational use that must be taken into consideration. The Arizona Snow Bowl is a snowboarding and skiing recreation area in Flagstaff Arizona, and has recently begun using reclaimed water to create more snow to extend an expand recreational activities in the high desert climate of Northern Arizona. While some argue that economic interests are more important than cultural claims to sacred spaces, we believe that this action is taking away from cultural practices of the local Native Americans, and is impacting the local economy negatively. The purpose of this presentation is to set out a model of the cultural and economical impacts the reclaimed water has on Flagstaff and the local people.

Kumorek, Megan  
Facility mentor: Jaime Awe

Session II, 2:00pm-4:00pm, 107A  
**Title: BVAR 2015 Xunantunich Conservation Project**  
This poster focuses on the excavations conducted by the Belize Valley Archaeological Reconnaissance Project (BVAR) during the 2015 field season at the Xunantunich epicenter, Operation SC-3, at structure A-20 and the base of structure A-8. The research conducted aims to better understand the development of the Xunantunich site core as well as to locate caches and burials that will help to understand and date the activities taking place at the end of the site's occupation. All structures excavated in the 2015 season will be conserved for the purposes of not only tourist development but also the preservation of the cultural heritage in Belize.

Labadie, Jean-Paul  
Luis Valenzuela, Jordan Marshall, Abdulaziz Alhawas  
Facility mentor: Wolf-Dieter Otte, Darrin Lemmer

Session II, 2:00pm-4:00pm, 5B  
**Title: Developing a Graphical Interface for Genomic Analysis Tasks**  
As the reliance on information systems continues to expand in all scientific fields, it is critical that access to these tools be expanded as well. Modern biological research all but requires the use of genomic sequencing as a principle source of statistical information, which is itself dependent upon large-scale data architectures and software. However, the common tools for interacting with these complex computing systems are often underdeveloped. We have designed and built a new graphical user interface that allows biologists to more effectively use a genomic analysis tool called NASP.

Labadie, Jean-Paul  
Luis Valenzuela, Jordan Marshall, Abdulaziz Alhawas  
Facility mentor: Wolf-Dieter Otte, Darrin Lemmer

Morning, 10:20am-10:45am, duBois Meadows Room  
**Title: Developing a Graphical Interface for Genomic Analysis Tasks**  
As the reliance on information systems continues to expand in all scientific fields, it is critical that access to these tools be expanded as well. Modern biological research all but requires the use of
genomic sequencing as a principle source of statistical information, which is itself dependent upon large-scale data architectures and software. However, the common tools for interacting with these complex computing systems are often underdeveloped. We have designed and built a new graphical user interface that allows biologists to more effectively use a genomic analysis tool called NASP.

**Lamaestra, Katie**  
Jorge Pantoya, Paulina Zepeda Uresti  
**Faculty mentor:** Susan Stutler

**Session II, 2:00pm-4:00pm, 108C**

**Title: Science Fiction to Reality: Discovery and Beyond**

In a recent report on what is being termed the "New Work," the Pew Charitable Trust wrote, "The creative jobs that drive innovation are now the highest 'value added' jobs in the world…” While the European Union and China move national curricula towards the U.S. creative problem solving models of the 1960’s and 1970’s, education in U.S. grades Pre-K through 8 continues to trend overwhelmingly toward standardized curriculum, drill and rote memorization, and high-stakes testing. Not only will curriculum like this preclude opportunities for challenging, integrated learning experiences that require critical thinking and tap into creativity, it will fail to prepare students to become the innovators desperately needed in this new century. Through a milestone project, students will create a future city where they will be confronted with real world problems and issues such as food, water, resources, sustainability, and overpopulation. And, they will face the global problems of the future such as creating an equitable society that contains many histories, geographies, habitats and even multiple species. To solve these problems, students will delve deep into history, science, geography and math in ways that will make these subjects come alive. Using the literary genre of science fiction and SteamPunk motifs to spark students’ interests and imaginations, the curriculum will challenge students to collaborate, communicate, innovate and create. In so doing, these young 4th, 5th, 6th, and 7th graders will become the globally engaged innovators and action oriented problem solvers that we will need in the 21st Century.

**Lamy, Shannon**  
Alanna Koritzke  
**Faculty mentor:** Jani Ingram

**Session I, 9:00am-11:00am, 24A**

**Title: Arsenic Speciation Method Development for Characterization of Unregulated Water Samples**

Contamination of water sources on Navajo Reservation land is a prominent issue. This contamination comes from several mines in the area that were not properly remediated resulting in contamination from uranium and arsenic in many of the unregulated wells. Different species of arsenic can be present in drinking water sources in the environment, with varying levels of toxicity. It is already known that arsenic is present in water samples that were collected from the Navajo Reservation, but the amounts of the different arsenic species are not known. This experiment will use the U.S. Geological Survey (USGS) procedure of laboratory arsenic speciation using a phosphate mobile phase and Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) detection. The column that will be used is a Hamilton PX-100 column. This experiment will be done to determine if the species arsenite [As(III)] and arsenate [As(V)] can be detected in prepared water standards using this method. A phosphate
buffer will separate the species of As(III) and As(V) before the sample in introduced into the ICP-OES instrument for detection. After the standards are run, water samples from the reservation that are known to contain arsenic can then be tested to determine the amounts of the two arsenic species. The expected results are that the two species will be separated efficiently and the amounts of arsenic species can be detected in the standards and water samples.

Larsen, Kristen  
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 60B

Title: Prehistorical Art of the Neolithic Time Period
During this presentation, I will talk about the pre-historic artwork done in the Neolithic Period in order to explore the change and significance of agriculture. With the examples of multiple sites, viewers will understand the changes by use different archaeology sites and cultural examples.

Larsen, Moriah  
Faculty mentor: Scot Raab, Roger Bounds, Dierdra Bycura

Session I, 9:00am-11:00am, 121B

Title: Physiological Responses to Thermal Stress
Across the country, extreme temperatures threaten the health of athletic participation. In hot climates, it can lead to life threatening issues requiring accurate assessments in order to provide appropriate emergency care. Equipment laden athletes who wear protective equipment are at high risk of heat illnesses due to the inability for their bodies to dissipate heat. In addition, other athletes who may not wear protective equipment (i.e. distance runners or extreme endurance enthusiast) also experience heat illness due to the nature of continued body heat production. As sports intensity increase, the incidents of Exertional Heat Stroke (EHS) will continue to climb and bring up the question of ‘What is the best method(s) to diagnose and treat such illnesses?’ The 2015 National Athletic Trainers Association (NATA) Position Statement on EHS cites two main criteria for diagnosis of EHS, core body temp (CBT) above 105 degrees taken via rectal thermometer and central nervous system (CNS) dysfunction. In question, if newer approaches to CBT measurements can provide less intrusive measures and reliable data when compared to rectal thermometry. It has been preliminarily established rectal thermometer measurements are less responsive to temperature fluctuations than other measures (i.e. tympanic). The blood supply to the tympanic membrane is very similar in temperature to blood perfusion to the hypothalamus and may serve as an ideal CBT assessment location. This study purposes to assess CBT during staged incremental exercise on a cycle ergometer comparing rectal and tympanic temperature measures.

Lathan, Selena  
Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 96C

Title: Behavioral Change: Cleansing the Body
The purpose of this project is to show the reason why people need to drink more water over sugary drinks. Showing the ways it helps our body by cleansing it. All while, explaining the importance over
the every day, easy access, drinks we have all the time. Along with the affects to our bodies because of not drink enough water.

Laufer, Mikayla  
**Faculty mentor:** Nancy Riggs  
**Session I, 9:00am-11:00am, 14D**  
**Title:** *Investigation of SP Crater, Northern Arizona, Eruption History Through Mineralogical Analysis*  
The eruption of SP Crater, located 50 km north of Flagstaff, AZ, occurred approximately 60 ka. Stratigraphic columns and componentry studies focused on cinder size distribution and mineralogy indicate the possibility of two eruptive phases. Evidence of this is supported by color, density, and vesicularity variations as well as changing mineral assemblages. Samples analyzed from SP Crater show great variation in their visible characteristics. Tephra from the first phase of the eruption consists of two different assemblages. The first, a dark, somewhat vesicular tephra, contains minerals ranging in size from microscopic to 4mm. Evidence of quartz, olivine, and pyroxene establish imperial data for a gas-rich eruption with varying magmatic composition. The second tephra is of lower density, lighter in color, and frothy. Mineral assemblages of this tephra, comprising of quartz and pyroxenes, are often undistinguishable under the microscope. These two vesicular tephra types, of similar mineralogy, are evidence of the first eruptive phase, a gaseous Strombolian eruption. Lapilli-size clasts ranging from little to no vesicularity are found above the tephra and are denser, darker in color, and contain crystals ranging in size from microscopic to 6mm. While mineral content is similar, variations in gas content resulting in vesicularity changes indicate a second eruption phase following SP’s flow from the northern base of the cone. Both microscopic analysis and hand-sample identification support that the aberration of tephra samples collected around the flanks of SP provide evidence for a two-phase eruption. Additional analysis will confirm the working hypothesis.

Laurich, Megan  
**Faculty mentor:** Britton Shepardson  
**Session I, 9:00am-11:00am, 60C**  
**Title:** *Prehistory of Death and the Afterlife in the Middle East and Northern Africa*  
The daily lives of prehistoric peoples are very difficult to figure out or even imagine. However, by analyzing burial sites anthropologists are able to get a look into what some of their beliefs might have been. An analysis on what prehistoric peoples in the Middle East and Northern Arizona believed in regards to death and afterlife will show if there are any similarities between the different prehistoric cultures.

Lavender, Kara  
**Faculty mentor:** Brandy Judson  
**Session II, 2:00pm-4:00pm, 96C**  
**Title:** *Behavior Change: Less Internet Time, More Study Time*
I am tracking my progress as I change my disruptive behavior to productive behavior. My studying is often disrupted or ignored because I watch Netflix and surf the web too much. I am slowly changing my behavior and being observant to what helps and does not help me stay away from being distracted.

Lawhead, Emily  
**Faculty mentor:** Zsuzsanna Gulacsi  

**Session II, 2:00pm-4:00pm, 107D**  
**Title:** *Contemporary Japanese Installation Art: Five Approaches to Exhibition Space*  
This poster explores the typology of works produced by Japanese installation artists as studied with funding from the Hooper Undergraduate Research Award. The fieldwork conducted alongside this research involved photographing installation space both in Arizona (Phoenix Art Museum) and in Japan (Tokyo, Osaka, Kyoto). Artists interviewed and work analyzed include Yayoi Kusama, Yasuaki Onishi, Nobuhiro Nakanishi, Rikako Nagashima, and Kohei Nawa, with additional perspectives on installation art by Flagstaff artists Shawn Skabelund and Sei Saito.

Lawhead, Emily  
**Faculty mentor:** Zsuzsanna Gulacsi  

**Afternoon, 1:30pm-1:45pm, Liberal Arts (Bldg #18) Room 120**  
**Title:** *Contemporary Japanese Installation Art and Its Medieval Roots*  
Installation art is defined as an artistic genre of three-dimensional works that are site-specific and designed to transform the perception of a space (Oxford English Dictionary). Installation art has a long history in Japan, the first examples of which may be manifested in Buddhist Zen landscape gardens such as Ryoan-ji (1450 CE) and Saiho-ji (1339 CE). Subsequently, Japanese artists have been at the forefront of developing installation art as a new artistic medium, after actively employing installation concepts of space since the 11th century.

Lawrence, Beau  
**Faculty mentor:** Ryan Fitch  

**Session II, 2:00pm-4:00pm, 39A**  
**Title:** *Using Regression Modeling to Predict the Winner of the 2016 MLB World Series by the All Star Break*  
In this project, key sabermetrics for both teams to participate in the World Series for each of the last ten years were plugged into regression models that provide correlation insight along with percentage weights, which then contribute to components of an algorithm. These measures were accumulated for each team for their individual World Series seasons and serve as indicators of their inevitable success at the end that season (either winning or losing the World Series). The scope was narrowed to four main areas of individual assessment for each team: batting, baserunning, pitching, fielding. With the information provided from this analysis, at the 2016 All Star break the average statistical mind will be able to develop the statistical chance of each of Major League Baseball's thirty teams winning the 2016 World Series, with the highest probability being the best bet to win and the highest probability in the opposite league being the best bet to reach the Series and lose. If taken far enough, one might use
these probabilities to project the exact postseason outcomes for all teams in both the American League and the National League.

Lawrence, Beau  
Shane McLaughlin, Brian Sniegowski, Joe Ford  
**Faculty mentor:** Dennis Foster

**Session II, 2:00pm-4:00pm, 39B**  
**Title:** Abolishing the Department of Education  
We intend to offer a scenario in which the Department of Education would be abolished, resulting in complete and total privatization of education across America. Leaving education to a free market system would eliminate the inefficiencies that exist because of government control of the public education system, as well as increase competition that would result in better, more affordable education for all students.

LeClair, Alexander  
Breanna Turrentine, Peter Keeley, Mitchel Rinehart, Jennifer Lavoie  
**Faculty mentor:** Lisa Tichavsky

**Session II, 2:00pm-4:00pm, 103D**  
**Title:** Booze & Grades: A Study of Alcohol Consumption and Academic Success  
A large part of college involves experiencing new things that haven't been allowed before, or at least were greatly restricted, namely consuming alcoholic beverages. However, there is a necessary balance between school and social life that must be met in order to succeed in school. The purpose of our study is to examine whether alcohol use or level of self-control is a stronger predictor of academic success. We find this important to examine because though there is literature that suggests a relationship between alcohol consumption and academic success, there is still a question as to whether low levels of self-control have an effect on academic success above and beyond the use of alcohol. We surveyed 150 students at a midsized Southwestern university asking about their alcohol consumption, self-control (Grasmick, Tittle, & Ward, 1993), as well as academic and demographic characteristics. We utilize OLS regression to test the hypothesis that students who consume more alcoholic drinks will have lower levels of academic success. Results and discussion are in progress but will be provided.

Ledesma, Madison  
**Faculty mentor:** Francis Smiley

**Session II, 2:00pm-4:00pm, 60C**  
**Title:** The Ethnography and Archaeology of Hunter-Gatherer Societies in the Rainforest: The Kombai of West Papua  
This poster presents a visual and textual examination of the material record of the ethnographically known Kombai society of West Papua. Archaeologists can learn a great deal about prehistoric societies by closely examining the material records of living societies, especially in the case of the Kombai, who have not changed their lifestyle in 30,000 years. The Kombai are a hunting and gathering society who reside in the jungles of West Papua. The Kombai inhabit certain areas of the jungle in which they hunt and gather. The Kombai often interact with the neighboring tribe, the Korowai, who live much
the same way. The Kombai build temporary tree house dwellings and hunt and gather using simple, mostly organic, tools so I predict that the archaeological record will be extremely limited. The purpose of the presentation is to set out a model of the kinds of material cultural items produced by a society given the social organizational and other cultural factors that govern the operation of that society. The poster also presents examples of archaeological research on similar societies to compare archaeological reality with the ethnographically derived model.

Lee, Jackson  
**Faculty mentor:** Britton Shepardson  
**Session I, 9:00am-11:00am, 60D**  
**Title:** Weapons and Warfare  
This project will be very interesting and appealing. It will explain the weapons, and warfare back during the Paleolithic period. It will be concise and down to the point. It will be a very creative and eye popping. I truly am excited to get started with this project.

Lee, Tracey  
**Faculty mentor:** Christopher Jocks, Alisse-Ali Joseph  
**Session I, 9:00am-11:00am, 69A**  
**Title:** Alcohol Epidemic of the American Indian  
Why and how, has alcohol disproportionately affected American Indian communities and individuals? What does this say about the history and oppression of Native people? What are the probable solutions? In answering these questions, I will discuss the history of Native American people within the United States, in relation to policies that failed to regulate alcohol consumption. In addition, I will breakdown the detrimental stereotype that Native people face today, pertaining to alcohol consumption. Although I will be conducting research on the entire Native American population within the United States, my main focus is on the Din4 (Navajo) people, specifically in the Gallup, New Mexico region. The current and most detrimental issue that many Native communities face today is the abuse of alcohol. Alcohol is largely an epidemic on most American Indian Reservations, and the Tribes have very little or no resources to address these issues. Alcohol creates many issues in the individual's life, and in the community. From issues of broken families to homelessness, these issues can all be solved with the prevention and immediate intervention of alcohol abuse.

Lee, Tracey  
**Faculty mentor:** Mansel Nelson  
**Session II, 2:00pm-4:00pm, 69A**  
**Title:** The Federal Clean Power Plan and Carbon Emissions on the Navajo Nation  
Three coal-fired power plants located on/near the Navajo Nation releases approximately 44 million tons of carbon pollution into the air on a yearly basis. These emissions have been a concern to the communities' health and the environment of the Navajo Nation. In partnership with President Obama and the Environmental Protection Agency, the Clean Power Plan was initiated to address climate change throughout the U.S. The goal of the plan is to reduce 32 percent of carbon emissions by 2030. My responsibilities mostly consisted of outreach to educate tribal leaders and community members on
the importance of their involvement with information sessions held on the Navajo Nation. Despite progressive efforts, the U.S. Supreme Court has placed a hold on the plan claiming that state and energy corporation's rights have been violated. In the meantime, the community is encouraged to support the plan and use clean energy to offset carbon emissions.

**Lehmkuhl, Erik**
Lindsey Stolze, Kelsey Banister

**Faculty mentor:** Stephen Shuster, Rebecca Beresic-Perrins

**Session I, 9:00am-11:00am, 26A**

**Title:** Development of microsatellite markers to assess paternity and genetic population structure in the leech Helobdella modesta (*Hirudinea: Glossiphoniidae*)

The goal of our project was to develop microsatellite DNA markers to quantify the frequency of self-fertilization in the hermaphroditic leech Helobdella modesta. Selfing is rare in animals because of the deleterious effects of inbreeding, but appears to be common in this species. Microsatellite markers consist of nucleotide tandem repeats within the H. modesta genome that are likely to be polymorphic among individuals. We began our assay by whole-genome-sequencing three H. modesta samples using an illumina MiSeq. From the genomic data, we designed 15 primer pairs each flanking regions with nucleotide tandem repeats. We evaluated these potential primer pairs against 46 leeches of three different populations to determine if PCR product would consistently be produced. We then used Sanger Sequencing to analyze the potentially variable microsatellites that were successfully amplified by the primer pairs. We found three nucleotide tandem repeats that were variable between populations but not between individuals; all individuals within a single population were homozygous for the same alleles. We will also use Sanger sequencing (ABI 3730) to increase our sample size and possibly detect additional individual polymorphism. We are currently testing 25 additional primer pairs to determine whether they show different patterns of polymorphism. Our results will provide insight into when and why H. modesta, may self-fertilize in nature, where opportunities to outbreed are common.

**Lembke, Tessa**

**Faculty mentor:** Becky Butcher

**Session I, 9:00am-11:00am, 125C**

**Title:** Culture, it's Relationship to Business Practices and Leadership Qualifications

Human practices in business have greatly varied, both over time and geographically. The culture of a people can greatly dictate the rules and common practices of a society. When expanding a company globally, it is important to study the changes in practices from a local culture to a global one because the personal actions of one person can make or break important business deals and relationships. Looking at the company W.L. Gore, this project seeks to determine specific practices both locally in the United States and internationally in Japan and China. With this research we will be able to see the similarities and differences of practices and teachings, and view how they apply to the leadership expectations of the specific company.

**Lenzi, Dallas**

**Faculty mentor:** Britton Shepardson
**Session II, 2:00pm-4:00pm, 60D**

**Title: Burials of Neolithic Europe**

The late stone age in Europe was a time of great human advancement and complexity. Many of the remains we have are from stone tombs and burials common of the time. These burials give us a look into the beliefs of the ancient Europeans, what lives they lived, and relationship to those they lived with. How human beings care for their dead is complex, individual, and a deep reflection on the culture and values of the people. The project will explore many of the prominent burials of the region and comparisons to today's death and burial customs.

Leon, Antonio  
Miles Jones, Eric Wolf Schuller, Karla Rodriguez, Paige O'Fallon  
**Faculty mentor:** Jamie Clem

**Session I, 9:00am-11:00am, 96D**

**Title: Self-Harm: Don't Ask, Don't Tell!**

For our SW 355 class: Research Methods, we will be surveying our fellow undergraduate research students on their opinions towards the controversial Department of Housing and Residence Life Policy 9.5. This policy is related to self-harm and potential removal from student housing.

Leung, Kaitlyn  
**Faculty mentor:** Emily McKay

**Afternoon, 1:15pm-2:00pm, Skydome Stage A**

**Title: A Listener's Guide to Edgard Varese's Flute Work**

To me, music is a guide to reaching across time and space to communicate the emotions of the performer and composer to a listener. However, their feelings can be impossible to communicate without understanding of the work. This presentation will dive into the intricacies of Edgard Varese's solo flute work, 'Density 21.5,' for the main purpose of bringing the complex work into comprehension. I will introduce the composer and the background behind the composition of the piece, but will more deeply discuss what makes 'Density 21.5' a thought-provoking work. As this piece emerged at a time when classical music was at the crossroads of emerging into something completely new, comparisons to what listeners usually think of as classical music to the era's current music need to be drawn in order to understand this work. Moreover, since 'Density 21.5' is a member of an obscure era of music, I will explain why this work needs to be listened to and how it fits into our current concept of music. I will perform some of these elements on my instrument to relate hearing the music to the theory behind it. This information will also be presented via Prezi so elements are easier to see and present. Finally, I will perform the entire piece on my instrument at the end of the lecture so it can be heard in its complete form.

Lewin, Parker  
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 66D**

**Title: Food and Nutrition**
This poster will go into detail about the various types and ways of what and how our ancestors collected food around the world. This will date back thousands of years and will also show some of the ways food was collected.

**Lewin, Parker**  
**Faculty mentor:** Stefanie Kunze  
**Session II, 2:00pm-4:00pm, 66D**  
**Title: Native American Nutrition Issues**  
For many years there have been poverty and food problems inside of the reservations. Making enough to support a healthy diet while living on a reservation is extremely hard for Native Americans so they have resorted to Fast Food and other unhealthy choices. My project will bring awareness to NAU about this issue.

**Liebig, Andrew**  
**Faculty mentor:** Constantin Ciocanel, Cindy Browder, Gerrick Lindberg  
**Session I, 9:00am-11:00am, 3C**  
**Title: Effects of Electrode Morphology on Power Structural Composites**  
The development of durable, lightweight, high density energy storage devices is one of the most pressing technological challenges of the twenty-first century. Hybrid and electric vehicles, renewable energy sources, and Unmanned Aerial Systems all require new and innovative energy storage technologies to continue their development towards wide-spread, practical use. The development of multi-functional composite materials provides a potentially elegant solution to these challenges. Carbon fiber structural composites are strong, durable, lightweight, and already in wide-spread use in automobiles, aircraft, and many other applications. By replacing the epoxy resins normally used in such composites with a solid polymer electrolyte (SPE), these structural composites can take on added functionality as electrochemical double layer supercapacitors (EDLCs). However, untreated structural carbon fibers do not make ideal capacitor electrodes and lead to an electrical system of mediocre performance. To maximize the potential performance of these multi-functional composites, it is critical to experiment with methods of functionalizing the structural carbon fibers. Functionalization in this case refers to treating the carbon fibers with chemical additives in an attempt to improve their electrical performance without sacrificing their physical strength. With the use of various additives, such as carbon nanotubes and metal-organic frameworks, these multi-functional composites are one step closer to industrial/commercial viability and wide spread adoption.

**Liebig, Yuqi**  
**Faculty mentor:** Ryan Fitch  
**Session II, 2:00pm-4:00pm, 39D**  
**Title: Bankruptcy and development of Chinese photovoltaic companies**  
In the paper, Suntech, LDK and YINGLI GROUP will be selected as the representations of the solar energy companies. Santech has reorganized and YINGLI never suffer bankrupt in the past. Why these three companies are in different situations even though they are of a similar type in the same market?
Moreover, from the analysis of change in the technologies, policies and labor markets, what can we expect to the from the Chinese solar companies? To be boarder, we can see the future possibilities of solar energy development in China by these Chinese solar energy companies.

**Little, Hannah**  
Brittany Nigh, Demri Williams, Briana Abney  
**Faculty mentor:** Gerald Wood

**Session II, 2:00pm-4:00pm, 45C**  
**Title:** Reforming School Discipline Policies  
The purpose of this research, study, and project is to promote Flagstaff Unified School District's Disciplinary Policies while providing concrete evidence against the Zero Tolerance Policy. This paper will address the devastating impacts of zero tolerance on students, especially minorities, and provide alternative approaches to school discipline. The Community-Engaged Research Project is a way to draw explicit attention to zero tolerance in an attempt to limit the use of the policy in public schools.

**Llata, Jake**  
Ashleigh Dalton, Rien Milburn, Daniel Reza  
**Faculty mentor:** Nicole Bies-Hernandez

**Session I, 9:00am-11:00am, 76B**  
**Title:** Women are Going to Eat, Men are Going to Have Sex  
This study will expand on what is known about how men and women cope following a breakup. It has been found that there are different strategies used to cope following a breakup, which can be different based on gender (Morris, Reiber, & Roman, 2015). They expressed the differences between emotional and physical responses as coping mechanisms. This study aims to examine these strategies towards college students. It is hypothesized that college students will tend to pick scenarios in which people participate in considerably high amounts of risky behaviors (i.e. sex with strangers, illegal drugs, and consumption of alcohol) after going through a breakup. In order to find these statistics, participants will be given various hypothetical breakup situations, giving information about how long the relationship was, which gender ended the relationship, and each gender's emotional state following the breakup. Participants will also be asked to answer a few questions in a survey regarding the scenarios, such as how they expect each gender to react. This study is important because there has been little to no research done on how college men and women differ in their reactions following a breakup. If the predicted results are found, then future research can bring more emphasis and awareness to how emotional distress can influence unhealthy and risky behaviors.

**Logue, Nelsina**  
**Faculty mentor:** Brandy Judson

**Session II, 2:00pm-4:00pm, 96D**  
**Title:** School-Life Balance  
Balancing a college education with family life can be stressful and frustrating at times. But as a parent with kids, accomplishing this skill is necessary in order to succeed in the goals you have set for yourself. Learning how to optimize your time is very important in balancing the roles between being a
college student and a parent. In order for me to succeed in balancing my college life with my family life I will be implementing steps that have been identified by universities and people who have been in the same situation when they went back to college after having kids. I will be presenting on what did and did not work of the following: Utilizing what the campus has to offer; Planning out my weekly to-do list; Scheduling a time for study; Getting enough sleep each night; Including the kids; Scheduling time to relax; Planning a weekly reward for success. My success in obtaining this goal will be helpful in my future career as a social worker because I will be able to understand what my future clients may be struggling with when they themselves might be a parent going back to college. Communicating the steps I have taken and my success to these individuals can help them find that balancing between their college and family life too.

Longoria, Anessa  
Faculty mentor: Britton Shepardson  
Session I, 9:00am-11:00am, 61A  
Title: The Pre-History of Food and Nutrition in South America  
My presentation will be on the prehistory of food and nutrition. I am narrowing down my research to just the information of a specific location. I am choosing South America as the location and that is where my project will be focused on.

Lott, Alexsandra  
Faculty mentor: Brandy Judson  
Session I, 9:00am-11:00am, 95A  
Title: Behavioral Transformation  
I have two miniature schnauzers that I'm trying to train by myself by researching techniques and strategies that will help me better understand the psychology of dogs. By doing so I can recognize the actions of my dogs and redirect misbehavior into respect. By being authoritative and following through with disciple techniques I can teach myself how to be a pack leader and a great dog owner through understand the psychology of dogs. I'm working on my own behavior as well; research shows that dogs communicate with other dogs and people through their energy and smell. I am making a transformation as well so that when I begin the training techniques I am in a calm mind set, thus putting me in control of the situation. If I can create a healthier mind set for myself my dogs will be able to sense my calm energy and this will make the training experience less stressful. I personally think that some people tend to treat their dogs like children, which isn't wrong, I have the tendency to do that at times but my problem and possibly others is that we do not set boundaries and limitations which is what I have been working on and eventual understand the process of having good communication with my pets. Through this project I am able to reach my goal of controlling my own life by controlling my pets and show others the steps I took that could be helpful for someone else.

Lovell, Haleigh  
Alexis McKinley, Shannon O'Neill, Chelsea Hill, Tammara Shaw  
Faculty mentor: Jay Sutliffe  
Session I, 9:00am-11:00am, 113D
**Title: Managing Stress with College Triathletes**

College students experience multiple factors that will trigger the stress hormone, cortisol, to rise throughout their academic performance. These factors include school work, social activities, jobs, clubs, etc. The Northern Arizona University (NAU) triathlon team, also known as Trijacks, can experience higher cortisol levels because they have the added stress of being a committed student and athlete. We worked with these triathletes once a week to help them understand their stress levels and reduce their overall stress in a matter of four lessons. In order to reduce their stress, we provided them with lessons that focused on physical activity, alcohol, nutrition, and overall stress management. Our results showed that most of them had reduced their stress at the end of our implementation period. We gave the triathletes a survey during the first and fourth weeks so we could compare and contrast any difference in their stress. We also asked them to complete a PSQI sleep study for each week to show how stress can affect their overall stress during our time with them. Based on our results, the college students and athletes can manage their stressful academic careers by focusing on using physical activity to decrease stress, consume less alcohol, and eat a balanced diet.

**Lovett, Taryn**  
Mikayla Poling, Rylee Northcott  
**Faculty mentor:** Viktoria Tidikis

**Session I, 9:00am-11:00am, 76C**

**Title: The Bystander Effect Among College Students**

Would you stop and help someone that you do not know who is in need? Some research suggests that many people would not help even if the person in need is in plain sight. Our study will examine whether males or females are more prone to show this effect. A survey will be conducted on Survey Monkey given to the students of Psychology 302W on the Northern Arizona University campus in Flagstaff, Arizona. The participants will be at least 18 years of age and are completing the survey voluntarily. Our target is to survey approximately 100 college students in Psychology 302W.

**Lozano, Michele**  
**Faculty mentor:** Ilya Gelfand, Nashelley Meneses

**Session I, 9:00am-11:00am, 17D**

**Title: Measuring Soil NOx Emissions from Biofuel Crops and Analyzing their Effect on Plant Photosynthetic Activity**

Energy consumption is constantly on the rise, it is imperative for society to meet the rising demand. Current research shows fossil fuel products have contributed to anthropogenic climate change. One alternative is, to use organic matter to provide energy (i.e., biofuels). Crops of plants dedicated to biofuel production depend on how much organic matter is produced (biomass) and how much of this can be converted into energy. Photosynthesis effects biomass production. The stomata, orifices found in the leaves of plants, are a critical component in regulating photosynthesis. Stomata open to obtain moisture and carbon dioxide from the atmosphere that is then utilized by the plant. Nitric oxides (NOx) are emitted by soils and may trigger stomata to close. My study aims to discover if nitric oxide emissions from the soil affect stomata aperture and plants' photosynthetic activity. Understanding the role which NOx soil emissions play in photosynthetic activity is important for biomass production in the biofuel industry.
Lucas, Haley  
Ben Boatwright, Nick Gager, Sam Woodrich  
**Faculty mentor:** Dennis Foster

**Session II, 2:00pm-4:00pm, 40A**  
**Title:** Should the Government Subsidize Green Energy?  
Government subsidies are a form of financial aid given to a certain economic sector, in hopes of promoting economic and social policy. Recently, Congress has provided these types of subsidies to the green energy sector; aiming to encourage the growth of new sustainable energy. Political leaders have used this strategy to encourage green energy companies to contribute to the nation's GDP. However, these subsidies have continued to prove unsuccessful, and the incentive to innovate has been abolished. Recent green energy subsidies enacted by the Obama administration have shown continued failure, and a blatant waste of funds. The boost in income has done nothing but stunt innovations for new technologies, and cause sustainable energy companies to go bankrupt. If government subsidies were taken out of the equation, and companies were left to compete in the market, there would be more of an incentive to innovate and compete with other firms.

Lucas, Haley  
Cody Cordell, Luke Hall, Dylan Ray, Yilin Li  
**Faculty mentor:** Xiaobing Zhao

**Session II, 2:00pm-4:00pm, 40B**  
**Title:** Love Canal Hazardous Waste Site  
Love Canal, located near Niagara Falls New York, was once a thriving community, but faced the issue of extinction due to the toxic effects of hazardous waste. This issue has been overlooked due to the lack of federal policy for the protection of sites that pose a threat to human health or the ecology. Issues arise when there is improper management or disposal of the hazardous wastes. Since the 1940's, Hooker Chemical and Plastics have purchased the right to dump waste into this river, and many years later, inhabitants experienced the toxicity in ground and surface water. The federal government uses a command-and-control approach in order to manage the waste like in the Love Canal story. However, this approach is not always cost effective and inefficient because it focuses on managing the waste and not reducing it at the source. We have found that a market based policy would better address the problem of toxic waste sites, where a fee would be charged to the firm dumping the waste, at the time of disposal. We aim to demonstrate how this market approach would benefit both the firms and all affected by the waste disposal.

Lutton, Robert  
**Faculty mentor:** David Elliott

**Session II, 2:00pm-4:00pm, 14C**  
**Title:** An Early Devonian Vertebrate Fauna from the Interlake Group Williston Basin, North Dakota  
The Williston Basin is a large subsurface geologic structure that is found over large portions of North Dakota and Montana in the United States, as well as Saskatchewan and Manitoba in Canada. The basin
is composed of shallow marine Paleozoic sediments that include a large unconformity (time gap) representing the Lower Silurian to the Middle Devonian. Core samples that were taken at three localities in the North Dakota region of the Williston Basin were identified at the time as being part of the Lower Silurian Interlake Group. Within the cores were fragmentary remains of early vertebrates that included species characteristic of the Early Devonian further south in Wyoming and Utah. Particularly characteristic is an armored jawless vertebrate, Cardipeltis wallacii. Based on known faunas the Williston Basin fauna is from the Emsian, late Early Devonian, while the rock unit they were extracted from has been identified as Early to Mid-Silurian and is therefore older. This indicates that the unconformity between the Interlake Group, dated as Lower Silurian, and the overlying Ashern Formation, dated as Middle Devonian, actually does contain some sediments that are Early Devonian in age. This information extends the geographic range of the vertebrate fauna from its known extent in Utah and Wyoming northwards into North Dakota and indicates the presence of shallow marine environments in these areas at that time, thus changing our understanding of the paleogeography.

Ly, Rang
Faculty mentor: Michael Rulon

Session I, 9:00am-11:00am, 53D
Title: The Destruction of the Alps
The Alps are the highest and largest mountain range located entirely in Europe. The Alps are home to over thirteen thousand species of plants and more than thirty thousand species of wildlife. Since 1950, the living space in the Alps has doubled, and the exponential expansion for causes continuous threats to remote areas of the Alps. The continued expansion of urbanization will have a detrimental effect on the environment as a whole. Although the amount of tourism gathers a large profit, the long-term environmental cost is much greater than the benefit, and expansion should stop.

Lyon, Anika
Courtney Lanzi, Marc Lizcano, Kelsey Kaba
Faculty mentor: John Houser

Session I, 9:00am-11:00am, 76D
Title: Caffeine and Affect State
Our project will be discussing the relationship between caffeine and positive and negative affect. We hypothesized that participants who consume caffineated coffee will rate a higher positive affect and a lower negative affect on the PANAS survey in comparison to those participants that drink decaffeinated coffee. Our participants will be research methods students. We will be providing half of the participants with decaffeinated coffee and half with caffineated coffee. The participants will then be shown and emotional video, and asked to fill out a PANAS survey on their current mood. We will conduct an independent groups t-test to evaluate the data.

Lyons, Megan
Deborah King, Michelle Miraglia, Yudid Lopez, Lindsey Spink, Emily Eggert
Faculty mentor: Jamie Clem

Session II, 2:00pm-4:00pm, 95A
Title: Social Work Capstone Research
According to the NAU website, the university is trying to revamp many of the capstone classes; we researched whether or not the Social Work capstone should be as well. We have researched different activities to improve the course and have it better meet its purpose, as outlined by NAU. We believe this will be relevant for all students, since everybody has to take a capstone before graduating. We have informed the survey takers of what the class's purpose is, and then surveyed them on what things they think would best help the class achieve that purpose.

Maciszewski, Michelle
    Amber Henne, Farrah Tsosie, Kaitlyn Crawford, Vanaessah Johnson
    Faculty mentor: Jamie Clem

Session I, 9:00am-11:00am, 95B
Title: Should technology courses be a requirement for the Social Work major?
As a group we researched by taking surveys of technology courses are helpful and if they should be a requirement for our social work major.

MacNair, Amanda
    Faculty mentor: Sharon Moses, Chrissina Burke

Session II, 2:00pm-4:00pm, 61A
Title: African American literature throughout U.S. history and the cultural/socioeconomic significance, as well as the academic significance to this field of study
The great author Jan Carew once said: “Literature does not die unless its creators become the victims of genocide and silence of the grave, and until its creations are erased from the mind’s ear and the mind’s eye and calcined in bonfires.” The purpose of this presentation will be to provide a brief overview of African American literature including a short history, with an emphasis on poetry and other writings that have had significant impact on American culture, leading up to current literature being written and issues that are portrayed. Within the information and context of this study there is a conclusive amount of evidence showing that the African American presence in the literary field is relevant and long-standing. Because of the vast amount of literature and its effect on social, economic, and political movements, the importance of understanding and having a knowledge of African American literature is vital to understanding American history, and should be integrated into the public school system in terms of studied material in order to provide a more diverse and historically-complete curriculum to uprising students and citizens. This research will work to exemplify its importance, with a regular grouping of examples to illustrate each point.

Madden, Kevin
    Ann Collier
    Faculty mentor: Ann Collier

Session II, 2:00pm-4:00pm, 76D
Title: Art Therapy Intervention for Diabetes Management in Palau
Palau and other Pacific islands are home to the highest number of obese individuals in the world. Amongst the obese populace, additional corresponding health issues, such as diabetes, are common.
Health care providers in Palau requested the development of an intervention regarding diabetes using art-based mediums. To implement such an intervention, eight sessions will be developed in order to help participants manage specific issues associated with diabetes. Two sessions will be held each week over a course of four weeks. The eight issues that will be explored through artistic mediums include: the management of motivation, self-efficacy, body image, social stigma, depression and stress, doctor patient relationship and compliance, barriers for increasing physical activity, and a general review session. Throughout the course of the four weeks, Palauan diabetes nurses, case managers, and health care professionals will be invited to co-lead the program with NAU staff. Diabetes self-management behaviors will be measured at the beginning and end of the program in order to establish changes in important variables. This community-based participatory research will serve to develop further support for art therapy as an effective intervention for physical and psychological ailments associated with diabetes. Future research will allow similar programs to be implemented in other Pacific Island nations.

Magee, Sarah  
**Faculty mentor:** Amber Nicole Pfannenstiel

**Morning, 9:30am-10:30am, Skydome East Concourse - ADA section**

**Title: Pinning Happiness**  
In this presentation I will discuss navigating and building Pinterest boards as a way of creating a moment(s) of happiness in feminized spaces. More specifically, how "packets" of pins create "pockets" of experience. The blog that I have been continuously building upon, which will be discussed in my presentation, is about my wedding planning experience (I am getting married this June) as it relates to Pinterest and this theory. I propose that Pinterest is a powerful learning tool when it comes to feminized spaces and traditional wedding expectations society holds today.

Maier, Rayla  
**Faculty mentor:** Francis Smiley

**Session I, 9:00am-11:00am, 61B**

**Title: The Material Correlates and Archaeological Correlates of the Inupiat Society of North Alaska**  
This poster presents a visual and textual examination of the material record of the ethnographically known Inupiat culture of Northern Alaska. Archaeologists can learn a great deal about prehistoric societies by closely examining the material record of the Inupiat culture and other living societies. The Inupiat are a hunting society of the northern slope of Alaska. The Inupiat inhabit a large area of North Alaska in which they hunt sea and land animals, most notably the bowhead whale. Villages are comprised of family units with strong kinship ties. Due to the frozen environment, and material culture of the Inupiat, I predict that the attendant archaeological record will be abundant. The purpose of the presentation is to set out a model of the kinds of material cultural items produced by a society given the social organizational and other cultural factors that govern the operation of that society. The poster also represents examples of archaeological research on similar societies to compare archaeology realities with the ethnographically derived model.

Malatesta, Stefany
Session I, 9:00am-11:00am, 78A

Title: On-Campus organizations and the relationship it has with life satisfaction with college students

When a student begins college, they are continuously encouraged to get involved and join organizations on campus, but do these clubs and additional obligations actually contribute to a student's satisfaction with the college experience? Previous research suggested that the social aspects of college contribute significantly to the quality of college life (e.g., Sirgy et al., 2010). The current study focused on the level of involvement and college satisfaction in university students at a rural, southwestern university. Participants were given a paper survey asking about their level of participation in on-campus groups and their level of satisfaction with college using a modified life satisfaction scale. A positive relationship was predicted between level of involvement and college satisfaction. The results of the current study could be valuable to incoming college students determining whether they want to join extra clubs in addition to their academics as well as universities interested in keeping their students satisfied and keeping retention rates high.

Manzo, Marcella
    Samantha Capatosto, Jaclyn Somborovich, Cassandra Gibbs
    Faculty mentor: Lisa Tichavsky

Session I, 9:00am-11:00am, 102A

Title: One Crime Two Crime Blue Crime True Crime: The Breakdown of Campus Blue Lights

The purpose of this study is to examine the factors related to individuals' opinion of the blue light system on NAU campus as well as the effect of blue light placement on crime. Since women have been reported to fear crime more than men, we expect that women will be more likely to have a higher opinion of the blue light system. We also expect that the number of blue lights in a given area will be associated with lower crime. We surveyed about 100 students and professors at NAU about their perceptions on crime and the effectiveness of NAU safety services. We will use OLS regression to examine the factors associated with higher opinions and usage of the blue light system. We then will employ crime mapping techniques to match blue light placement to the number of crimes in the area. The results and conclusions of the study are still in progress, but will be provided.

March, Melinda
    Lizsandra Benitez, Rachel Kortsen, Veronica Vidal
    Faculty mentor: Tricia Moore

Session I, 9:00am-11:00am, 109D

Title: Oral Health Status and Knowledge Among WIC Mothers in Flagstaff, AZ

PURPOSE: Early childhood caries (ECC) is the most prevalent chronic disease in childhood and is even more prevalent in low-income families, and ethnic and racial groups such as Mexican Americans and African-Americans. Children are five times more likely to have oral health problems if the mother presents with oral health problems. The purpose of this study was to determine to what extent the oral health of WIC mothers relates to their knowledge regarding oral health care for their infants and
children. METHODS: Four hygienists and 1 dentist traveled to the WIC office in Flagstaff, AZ three times in Fall 2015 to provide education and screenings for WIC mothers. RESULTS: Eleven mothers completed a questionnaire about infant and child oral health care. Each mother was also screened for decay, bleeding, inflammation and plaque. Most mothers had graduated from high school and had some college education. The mothers were fairly knowledgeable about behaviors that cause and prevent decay. More than half of the mothers had signs of decay and almost all mothers exhibited signs of periodontal inflammation. CONCLUSIONS: In this small sample, there was no significant relationship between WIC mothers' oral health knowledge and their oral health status.

Marlowe, Meaghan
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 61B
Title: Prehistory of Spirituality and Religion
I will be researching how early modern humans treated their dead. I am going to look at their burial sites, the different styles that were used, what items they were buried with and why, and how these early modern humans treated their fallen. I am curious of how early modern humans began with religious treatment of the dead before written text and still treated their dead with respect for the afterlife.

Marquette, Mallory
Rachel Geltmaker
Faculty mentor: Gerald Wood

Afternoon, 3:30pm-3:55pm, Skydome Roundtable R2
Title: Saved by the Bell: Alternative Philosophies of Teaching
This project aims to investigate several alternative philosophies of K-12 education, both broadly and in the context of Flagstaff, Arizona, not only for their effectiveness on their own but also for potential lessons that could be brought into the average public school classroom to improve their effectiveness. The project will examine both the strengths and weaknesses of the alternative philosophies and how they may be beneficial to the needs of individual students. It will also examine parents' knowledge and opinions of these alternative philosophies and seek to gain an understanding of what kind of students benefit the most from each. We will examine the research surrounding Montessori, Waldorf, Core Knowledge, BASIS, and Magnet schools to determine if their practices have produced significant results.

Marsh, Bradley
Serenity MacLennan, Jose Parra
Faculty mentor: Cindy Browder

Session II, 2:00pm-4:00pm, 23D
Title: Synthesis of Isoxazoline Bacterial Growth Inhibitors through Nitrile Oxide Cycloaddition Reactions
With antibiotic resistant bacteria on the rise, new drugs and methods must be developed to combat them. Medicinal chemistry can address this issue through rational drug design, where a specific target
is identified, and then compounds that are biologically active against it are designed based on the molecular structure and activity of the target. Targets of interest include enzymes critical for bacterial metabolism. By inhibiting these vital metabolic enzymes, bacteria are unable to produce their own amino acids, and thus bacterial growth can be significantly reduced or completely stopped. Our group is developing compounds that affect the active site of indole-3-glycerol phosphate synthase (IGPS), which is required for conversion of chorismic acid to tryptophan. IGPS is specifically involved in converting 1(o-carboxyphenylamino)-1-deoxyribulose-5-phosphate (CdRP) into indole-3-glycerol phosphate (IGP). The active site of IGPS is well-conserved across many bacterial species, thus making it a desirable target for broad-spectrum antibiotics. Our lab has developed libraries of potential drug compounds that inhibit IGPS, and we are continuing to optimize the chemical structures and synthetic strategies for the isoxazoline leads. Currently we are synthesizing various oximes and subjecting them to nitrile oxide cycloaddition reactions in order to produce a variety of isoxazolines for further testing. However, the key nitrile oxide cycloaddition reaction requires multiple complex procedures and provides poor yields. In this work, we report on our progress in optimizing the nitrile oxide cycloaddition reaction. We are exploring alternate oxidizing agents and solvents, and making modifications to the reaction concentrations and reactant ratios.

Marshall, Ryan  
Chris Young, Chris Yazzie, My Hoang  
**Faculty mentor:** Jeff Heiderscheidt, Alarick Reibolt

**Session I, 9:00am-11:00am, 7B**  
**Title:** RV Wastewater Treatment  
RV Wastewater Treatment The La Posa Long Term Visitor Area (LTVA) is an 11,400-acre campsite located about two miles to the south of Quartzsite, Arizona. At this site, recreational vehicle (RV) campers can stay continuously for up to seven months of the year. Wastewater flows at the site vary greatly throughout the year. From September through January, a regular flow of 3,000 gallons per day (GPD) steadily increases to a peak flow of about 100,000 GPD throughout the month of January. Currently, the campsite has two disposal systems. Each is composed of a septic tank, a holding tank, and a leach field. Due to the unforeseen increase in popularity, these disposal systems were not originally sized to handle waste flows of this quantity. Due to a high concentration of organic matter and a low dilution factor, the wastewater generated from RVs has a strength higher than that of municipal waste. This type of waste requires more oxygen for degradation and can more readily strip oxygen from any receiving body of water. As an added complication, RV owners add chemical sanitizers to the holding tanks, as to restrict the biological activity that produces Hydrogen Sulfide and causes unpleasant odor. These chemicals affect microbiological processes and reduce the efficiency of any treatment process. The purpose of this project is to design an on-site treatment system for the La Posa campsite. The system must be able to handle variable flows, be operated with a minimum level of skill, and be able to efficiently treat high strength waste to meet the National Pollutant Discharge Elimination Standard (NPDES) for discharge to the environment. The proposed design will be applicable in any remote and water-limited areas with the same environmental issue.

Marshall, Ryan  
Chris Young, Chris Yazzie, My Hoang  
**Faculty mentor:** Jeff Heiderscheidt, Alarick Reibolt
**Afternoon, 3:05pm-3:30pm, duBois Marshall Room**

**Title: RV Wastewater Treatment**

RV Wastewater Treatment The La Posa Long Term Visitor Area (LTVA) is an 11,400-acre campsite located about two miles to the south of Quartzsite, Arizona. At this site, recreational vehicle (RV) campers can stay continuously for up to seven months of the year. Wastewater flows at the site vary greatly throughout the year. From September through January, a regular flow of 3,000 gallons per day (GPD) steadily increases to a peak flow of about 100,000 GPD throughout the month of January. Currently, the campsite has two disposal systems. Each is composed of a septic tank, a holding tank, and a leach field. Due to the unforeseen increase in popularity, these disposal systems were not originally sized to handle waste flows of this quantity. Due to a high concentration of organic matter and a low dilution factor, the wastewater generated from RVs has a strength higher than that of municipal waste. This type of waste requires more oxygen for degradation and can more readily strip oxygen from any receiving body of water. As an added complication, RV owners add chemical sanitizers to the holding tanks, as to restrict the biological activity that produces Hydrogen Sulfide and causes unpleasant odor. These chemicals affect microbiological processes and reduce the efficiency of any treatment process. The purpose of this project is to design an on-site treatment system for the La Posa campsite. The system must be able to handle variable flows, be operated with a minimum level of skill, and be able to efficiently treat high strength waste to meet the National Pollutant Discharge Elimination Standard (NPDES) for discharge to the environment. The proposed design will be applicable in any remote and water-limited areas with the same environmental issue.

**Marson, Gabrielle**

- Luis Castro, Aaron Hancock, Devyn McLees

**Faculty mentor: John Houser**

**Session I, 9:00am-11:00am, 72D**

**Title: Time Spent on Social Media and its Relation to Academic Performance**

This is a class project intended to explore methods of research in psychological sciences and to create a correlational design in order to prove an association claim. This research project aims to find a correlation between the use of social media and academic performance amongst college students. Social media is an ever-growing landscape of communication that can connect you almost anyone around the world in a moments notice. Many things can be shared on social media including negative influence and distraction. This generation of students now has a big distraction that can get in the way of their education. The purpose of this study is to make students realize how much social media use correlates with their grades and study habits. We will be using a pre-existing measure called the “social media engagement scale” which comes from Alt (2015) study. Like the Alt (2015) study, we will be measuring social media use by measuring how much participants use certain kinds of social media engagements. From the “social media engagement scale”, we define social media engagement as Social engagement, News information engagement and Commercial information engagement. We will also be measuring participants self-reported GPA and like the Alt, D. (2015) study we will use Skills and Participation as a measure of academic performance by asking questions that are similar to the Alt, D.(2015) study that measured Skills and Participation

**Martín, Anika Shanelle**
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 61C

Title: The Evolution of Human Diet
I will be presenting a poster on how the human diet has evolved over thousands of years. Meaning, I will be researching about what our ancestors did for their nutrients and compare it to our methods, finally, I will conclude whether or not their diet was actually healthier compared to ours, considering the fact that we are consuming fast food, or fruits and vegetables with pesticides.

Martin, Kayla
Perla Pulomares, Madison Bohan
Faculty mentor: Viktoria Tidikis, Gregory Busath

Session I, 9:00am-11:00am, 78B

Title: How Friendships Influence Behavior in Adolescence
Our hypothesis asks whether or not our adolescent friendships influence delinquent or deviant behavior later on in life. We will be using a single tailed correlational study to determine whether or not our hypothesis is correct. Our sample population will be all students currently enrolled in PSY 302W, excluding students who have taken it prior, or who plan to take it in the future. Our method of obtaining results is by using a digital survey, sent out to students via email, and the results will be analyzed accordingly. Our survey includes a demographic background questionnaire, along with multiple choice questions, short answer and yes and no questions. After the conclusion of our study, and all the results from our participants have been received, they will be analyzed and the results will support our hypothesis or not.

Martinez, Alicia
Damariz Perez, Britlyn Gloria
Faculty mentor: Tricia Moore

Session I, 9:00am-11:00am, 110A

Title: Students' Knowledge and Behavior Related to Sugary and Acidic Beverages and Oral Health
Purpose: Dental caries (tooth decay) is common among young adults, perhaps related to the high number of sugary and acidic beverages they consume. The purpose of this study was to examine Northern Arizona University (NAU) student's knowledge and behaviors related to sugary and acidic beverages and tooth decay.
Method: Three dental hygiene students administered a questionnaire to a random sample of 100 students at a university campus dining facility. The questionnaire asked what students knew about the pH and sugar content of various beverages as well as which beverages they consume on a weekly basis.
Results: The most commonly consumed sweetened beverages were specialty coffee drinks, soda, and juice. In general, NAU students underestimated the amount of sugar in drinks. Most students knew that sugar plays a role in tooth decay; fewer knew that acid also plays a role in tooth decay. Most students were aware of the general pH range (acid, neutral, basic) of beverages, but students did not know the pH range at which enamel dissolves.
Conclusion: There was no relationship between NAU students' knowledge about beverages and their beverage-drinking behaviors. Although NAU students are aware of the negative effects of sugary/acidic beverages on dental decay, they are still consuming the beverages.
Martinez, Josie  
Faculty mentor: No mentor provided

Session II, 2:00pm-4:00pm, 95B  
Title: Behavior change of Procrastination  
This project is here to analyze the effects of procrastination in a student's life. Procrastination is a big aspect on whether a student will succeed or fail in college. Procrastination also has different effects on different people. In order to change the behavior of students it is needed to understand that they have the behavior and define what it means. Identifying certain behaviors that occur in order for that behavior to occur is required in order to also change the behavior. Identifying the behaviors, then changing the small aspects of the behavior is a start to changing the behavior as a whole. When the changes of the behavior are in effect, there are certain deviations that will be noticed in life. School work may be done more often, grades may go up and their might be less stress. So this behavior change is to help students improve in their school life in order to create better grades.

Martinez, Roger  
Faculty mentor: Francis Smiley

Session I, 9:00am-11:00am, 61D  
Title: The Ju'hoansi of South Africa: The Material Culture and Archaeological Correlates of a Hunting and Gathering society.  
This poster presents a visual examination of material culture of the Ju'hoansi society focusing on subsistence strategies and gender roles. The Ju'hoansi are the oldest inhabitants of South Africa where they have lived for more than 20,000 years in the Kalahari Desert. The Ju'hoansi are a nomadic indigenous society with a 'click' language and a hunting-gathering way of living. I approach the Ju'hoansi as an ethnoarchaeologist searching the ethnographic record for the material and archaeological correlates of the Ju'hoansi society with particular attention to settlement patterns, subsistence, and art.

Martinez, Roger  
Carlos Dominguez  
Faculty mentor: Frederick Lampe

Session II, 2:00pm-4:00pm, 61D  
Title: Benefits of Cultural Competency in behavioral health settings  
The Guidance center is a non-profit organization whose mission is to improve the behavioral health of the people in the community. The purpose of this proposal is to implement a cost-effective cultural and linguistic competence training opportunity for employees to help them recognize the importance of culture in the helping relationship. The implementation of cultural and linguistic competence will benefit the company's staff when dealing with diverse populations. Training will provide participants with comprehensive skills to work effectively with individuals and colleagues from other cultures, backgrounds, and belief systems. This will be done in hopes of both increasing productivity and properly allocating resources within the organization. The training will include a review of the many
dimensions of culture, the impact of worldview on psychosocial rehabilitation (PSR) practice, as well as the steps to becoming a culturally competent service provider.

**Mascarenas, Kristi**
Victor Jimenez, Fernando Monroy, Inez Pabian, Wayne Nez, Destiny Valenzuela
**Faculty mentor:** Fernando Monroy, Victor Jimenez

**Session II, 2:00pm-4:00pm, 25C**
**Title:** How does acute ethanol exposure affect metabolism within Burkholderia thailandensis E264 and Pseudomonas aeruginosa overtime?
Burkholderia thailandensis E264 and Pseudomonas aeruginosa are gram negative, bacilli bacteria with similar genetic makeup and morphologic structure. It has been shown that both bacteria thrive better in acidic environments. Acute ethanol exposure leads to acidic environments in humans. P. aeruginosa and Burkholderia pseudomallei, a very closely relative to B. thailandensis E264, are opportunistic pathogens which cause upper respiratory infections in humans. Humans who consume alcohol regularly are more at risk for Burkholderia infection. The objective of this project is to study the ethanol metabolism pathway of both organisms overtime and to measure microbial growth. Since B. thailandensis E264 is the model laboratory organism for B. pseudomallei, it will be used for this study along with P. aeruginosa. It is hypothesized that P. aeruginosa will consume more ethanol overtime when compared to B. thailandensis E264 because P. aeruginosa grows twice as fast as B. thailandensis E264. Ethanol metabolism will be measured using two enzymatic assays. Gene expression levels of Alcohol Dehydrogenase, a key enzyme in the ethanol pathway, will be determined using Reverse Transcription Polymerase Chain Reaction (RT-PCR). Preliminary results show that more ethanol is metabolized by P. aeruginosa overtime compared to B. thailandensis. Gene expression level studies are ongoing and will be able to quantify these results. If the bacteria are metabolizing ethanol to their advantage or metabolizing more at certain time points, it will help to explain why people who drink alcohol regularly are more susceptible to Burkholderia infections than people who do not drink alcohol regularly.

**Maslyk, Rachel**
Tani Rose Kageyama
**Faculty mentor:** Jerome Mahaffey

**Session I, 9:00am-11:00am, 86C**
**Title:** Risky Gymnasts - The Harm Competitive Gymnastics Can Cause to Developing Bodies
This project will explore the lasting effects that competitive gymnastics has on the human body. Starting competitive gymnastics before puberty has been claimed to stunt growth, enhance eating disorders and injuries, and even cause psychological problems. We will explore the truth in these claims and whether or not competitive gymnastics is more hurtful than helpful in the development of children to adults.

**Mason, Matthew**
**Faculty mentor:** Ryan Fitch

**Session II, 2:00pm-4:00pm, 40C**
Title: Industrial Production Economic Indicator
A recession is defined as a period of decline in an economy. In the United States, a recession is measured by two consecutive quarters (six months) having a decline in GDP. In the United States, GDP is compounded by categories such as 'unemployment, retail data, real personal income and industrial production'. The industrial production indexes are a major resource for economists and analysts who are trying to predict the next movement within an economy. The three key businesses that are considered in Industrial Production Index is manufacturing, utilities, or mining businesses. GDP, however, is measured with different inputs that create a different measure than that of the Industrial Production Index. Based on preliminary research, there are several correlations between the Industrial Production Index, GDP, and a recession. There are several sources that provide qualitative and quantitative data regarding the relationship between the measurements of a nation's production and its gross domestic product. An analysis of the questions derived between the relationships of these two measurements and potentially validates the accuracy of the Industrial Production Index predicting an economic change. Deriving a correlation, trend, or some form of a structure as to how the level of production within a nation and an economic change (contraction or expansion) can help protect several stakeholders involved. It is important for all the inputs of the United States GDP to be measured in order to validate their accuracy as an indicator for an economic recession.

Mason, Matthew
  Dereck Grey, Ryan Modi, Shengjie Mao, Bo Wang, Shandor Whitcher
  Faculty mentor: Xiaobing Zhao

Session II, 2:00pm-4:00pm, 40D
Title: Environmental Deposit Refund System
An Environmental Deposit Refund System is a product charge and/or a subsidy for recycling or properly disposing of recyclables. In the United States, only ten states support Deposit Refund Systems where they provide individuals an incentive to recycle various products which include plastic, glass, aluminum and various other disposable goods. With only 20 percent of the nation enacting these programs, it is important to analyze why there is not an increase in the amount of states establishing subsidies or rewards for proper recycling. In order to find a reason, it is important to find reasons as there are a lack of participants. This includes finding out the benefits and costs that are related to the environment, businesses, the state governments, and various other stakeholders involved. Researching and analyzing these benefits and costs could potentially identify why states are not actively involved in Deposit Refund Systems, or why more states should enact these programs.

Mason-Burrows, Austin
  Latisha Gilmore, Diera Mickens, Conor Hill
  Faculty mentor: Lisa Tichavsky

Session II, 2:00pm-4:00pm, 102A
Title: The Media's Influence on Police Perceptions
Because of the recent number of negative portrayals of police in the media, the purpose of this study is to examine whether or not the media influences perceptions of the police. We draw upon Cultivation Theory to measure the effects that televised media have on individual's perceptions of the police. We surveyed 100 students at a mid-sized southwestern university. We asked students about their police
perceptions, media exposure and past experiences with police while controlling for demographic characteristics (i.e. race) we utilize OLS regression to test the hypothesis that an increase in exposure to negative media on the police will be associated with lower perceptions of police officers. The results and conclusions of the study are in progress but will be provided.

**Massahos, Hayes**  
Tyler Phillips  
**Faculty mentor:** Nora Dunbar

**Session I, 9:00am-11:00am, 72C**  
**Title:** Fornicate or Evacuate  
This study focuses on the idea that there is a correlation between the satisfaction of sexual activity and the satisfaction of the overall relationship. The goal is to show that there is a significant correlation between the two items and to compare the difference in that correlation in males and females. This has been done by collecting data from specific surveys that score participants sexual and relationship satisfaction and using statistical tests to receive a coefficient from each score comparison. Upon examination of the collected coefficients and relation to the alpha level, it is clear there is a significant correlation between the variables. Discussion will be about how sex, and which sex had the strongest affects and why.

**May, Nicholas**  
Nick May, Derek Young, Aspin Huntley  
**Faculty mentor:** Jay Sutliffe

**Session I, 9:00am-11:00am, 114A**  
**Title:** CPR and Heart Health  
We will be providing students of Summit High School with information regarding healthy lifestyles to benefit long term heart health. This will include nutrition education, physical fitness promotion, and an overview of CPR. Due to the large number of students and high cost of CPR certification, we will not be certifying students for CPR administration. We will be providing them with the tools and information to obtain a CPR certification.

**McAfee, Kassidy**  
Alyssa Trinidad, Katie Reed, Kelsey Adams  
**Faculty mentor:** Jay Sutliffe

**Session I, 9:00am-11:00am, 114B**  
**Title:** Unleashing Memories Through the Harnessing of Music  
Almost 6 million Americans currently live with the most common form of dementia known as Alzheimer's disease. It shows that music is connected to memory recall, which can improve emotional wellness and reduce the rates of depression. The focus of this intervention was to use music to increase the emotional well being of the memory care residents at Brookdale Senior Living Center in Flagstaff. These residents are severely affected by memory loss from dementia or Alzheimer's and showed a substantial increase in memory after listening to music from their era. This music therapy program has
proven to be sustainable in the Brookdale memory care unit and will continue to provide them with opportunities to access emotional support and wellness.

McCain, Alexander
Molly Shuman-Goodier, Catherine Propper
Faculty mentor: Catherine Propper, Molly Shuman-Goodier

Session I, 9:00am-11:00am, 26D

Title: Effects of butachlor and competition on the development of Fejervarya vittigera and Rhinella marina.
Amphibian species such as the endemic Fejervarya vittigera and invasive Rhinella marina, inhabit rice paddies in the Philippines, and are exposed to high concentrations of the herbicide butachlor. Such exposure can reduce overall fitness and alter species interactions such as competition. Amphibians are model species with respect to how environmental contaminants can disrupt the thyroid and endocrine systems. Response to thyroid hormone during development is highly conserved across vertebrates and ultimately can aid in the understanding of how chemicals, such as butachlor, affect the endocrine system in other species, including humans. To test the hypothesis that butachlor interacts with competition to affect development in F. vittigera and R. marina, we validated the molecular tools needed to evaluate thyroid-hormone dependent gene expression. For each species, tails and intestines were homogenized and mRNA was extracted, converted to cDNA, and amplified using qPCR. For each gene amplicon product that amplified, we then used electrophoresis with an agarose gel to validate the amplicon size. This effort will allow for use of these molecular tools to evaluate thyroid hormone disruption in new populations of amphibians. Preliminary results indicated that the thyroid sensitive gene Kruppel like factor 9 might be used to compare changes in genes expression across treatments. With more research and understanding of environmental contaminants, we can educate the individuals most affected, mainly rural farmer populations working in rice paddies who are frequently exposed to hazardous pesticides.

McCormick, Derek
Scott Peterson, Kaden MacFadyen, Bennett Kool, Christopher Hood
Faculty mentor: Julie Heynssens, David Scott

Morning, 10:20am-10:45am, duBois Southwest Room

Title: Smart Energy-Saving RFID Light Switch
Dormitories and offices are large sources of energy waste. Our project addresses the problem of room lights being needlessly left on. Several solutions exist, but are not effective—they are intrusive and not appropriate for dorms or offices. Our design uses an RFID card reader to identify the presence of an occupant’s NAU ID and governs the room lights accordingly. We designed our solution to be easy to use by having the interface consist of two parts; a push button to toggle the lights similar to a wall switch, and a basket for placing multiple ID cards. When an ID is not present, the lights are automatically turned off. The device works using mechanical and semiconductor components as well as a low-voltage digital microcontroller. Prototypes have been designed and constructed and will be demonstrated during this presentation. By mandating that an NAU ID be present for the lights to turn on, this device will effectively stop the lights from being left on without the need for inconvenient
motion sensors. By keeping the lights off when the room is not in use, our design is environmentally green and saves university resources.

McCormick, Isabella  
**Faculty mentor:** Brandy Judson

**Session I, 9:00am-11:00am, 95C**

**Title:** *Can being healthy and fit make a difference in your happiness?*

When you have your health, you have everything. This is a phrase I have heard throughout my life, and I am finally starting to understand it. Personal fitness has been a focus throughout this semester and how your level of fitness can increase your well-being. Obesity has become a trend in the United States, with about 78.6 million Americans being overweight. The reason being is often not enough money to buy healthy food, and not enough time in the day to workout. During my first year of college I gained 20 pounds, attributed from a lack of exercise and unhealthy eating. I can now say I was the unhappiest that I have ever been. This past semester my goal has been to workout 5-6 times a week and strive to eat healthy everyday. My reward? My happiness.

McFadzen, Kristen  
**Faculty mentor:** Sumner Sydeman

**Session II, 2:00pm-4:00pm, 77A**

**Title:** *Parent-Child Interaction Therapy for Defiant Behavior Disorders: A Systematic Review and Meta-Analysis*

Objective: The purpose of this project is to examine the efficacy of Parent-Child Interaction Therapy for Defiant Behavior Disorders in recent psychotherapy clinical trials. A systematic literature review and quantitative meta-analysis was done to examine the effect of Parent-Child Interaction Therapy on symptoms of Defiant Behavior Disorders. A systematic literature review and meta-analysis is important because it combines the results of prior clinical trials in order to examine the efficacy of a particular treatment in greater detail than an individual clinical trial would be able to do. Method: A search through electronic databases, including PsychINFO and Pubmed, will be done consistent with best practice standards (Preferred Reporting Items for Systematic Reviews and Meta-Analysis protocols: PRISMA-P; Shamseer et al., 2015) for randomized controlled trials (RCTs) and non-randomized controlled trials (Non-RCTs) in which a control condition is compared to Parent-Child Interaction Therapy. Results: Clinical trials that meet criteria for inclusion will be reviewed for methodology and results. For each clinical trial an effect size will be calculated. Afterwards, an overall effect size statistic will be calculated for all of the clinical trials. The statistical program, Comprehensive Meta-Analysis (CMA) software, Version 3 will be used to conduct these statistical analyses. Summary: A summary of key findings of the systematic review and meta-analysis, including strengths and limitations of the published clinical trials, as well as suggestions for future research will be presented.

McGlothlin, Savonna  
**Faculty mentor:** Brandy Judson
Session II, 2:00pm-4:00pm, 95C

**Title: Importance of Self Care**

Self care isn't just a way to make oneself feel more put together but it is proven to reduce stress levels, depression, and anxiety. By taking care of one's hygiene, nutrition, and incorporating ways to reduce stress, one can completely change their way of life. I decided to do a self care routine in order to reduce my stress levels. First, I created a morning and night time hygiene routine to ensure I am taking care of my body properly. Next, I created a specific grocery list so I would only buy food that was on it. This keeps me accountable for my daily nutrition and helps me avoid eating junk food. Additionally, I have created a schedule for exercising, to ensure that I get the proper amount of exercise per week, due to exercise being a main source of stress reduction. Lastly, I keep a calendar in order for me to schedule events such as volunteering so I can be around people and keep my happiness levels high. I have also incorporated meditation and stretching into my everyday routine, which is also proven to reduce stress levels.

McIlhennymiller, Katie  
**Faculty mentor:** Miguel Vasquez

Session II, 2:00pm-4:00pm, 61C

**Title: Genocide: The Cause and The Aftermath**

This project is focused around the causes and the aftermath of genocidal events. I have looked at the Bosnian and Armenian genocides and the events that led up to them. I have attempted to locate the cultural aspects that cause such acts of mass violence to occur. While both acts were clearly politically motivated, there must be certain factors that cause the specific groups that were targeted to be targeted. These genocides followed both the formation of different ethnic groups and the emergence of hostility between them. I will not be following the commonly-held premise that these genocides occurred because these two groups have always hated each other and always will. I am looking at specific events that preceded the genocide and how those events influenced the occurrence of genocide. The act of such mass violence leaves behind a mark on the cultures involved. My goal is to look at how culture has changed post-genocide religiously, socially, politically, and economically. I am looking at how members of the group that were targeted have been affected as whole, and how their cultural and physical existence in the place where the genocide occurred was changed. By using a slightly more recent genocide and one that occurred a hundred years ago, I am able to look at how long it takes for a culture to recover from genocide. I plan on doing a poster that lies out the details of these cultures before and after genocide.

McKenna, Erica  
**Faculty mentor:** Melissa Santana

Session I, 9:00am-11:00am, 51B

**Title: New Ways to Fitness**

To design a fitness center that creates an exciting energy that affects one's emotions and awareness. The gym will help people feel better about their bodies through a fun, encouraging environment. This fitness center will create a unique style for working out, in turn promoting a healthier lifestyle. This
ultimate exercise experience in excess offers valet parking, live DJ's, and all your health and wellness needs in one convenient spot.

McKinley, Alexis  
Priscilla Sanderson  
**Faculty mentor:** Priscilla Sanderson, Roger Nosker, Rachel Billowitz, Regina Eddie, Allie Stender, Sydney Tolchinsky, Regina Eddie, Darold Joseph

**Session I, 9:00am-11:00am, 114C**  
**Title:** *Moccasin Story: The Birds and The Bees*  
Purpose: American Indian (AI) youth are at high risk for unplanned pregnancies and contracting STIs than any other racial group. The purpose of this project is to provide AI youth with culturally appropriate sexual, reproductive, and relationship information through an educational workshop called *Moccasin Story: The Birds and The Bees*. The goal is that AI youth will have improved health literacy, awareness, and knowledge on sexual, reproductive, and relationship health information. Methods: The approach to this project is based on principles of community-based participatory research. Participants will be 10 to 30 American Indian youth (14-18 years old) attending school in the Coconino County (non-reservation) area of Arizona. For five consecutive days, the workshop will cover the following topics: cultural resilience, sexual health, reproductive health, healthy relationships, and student presentations. Lesson components will be pulled from Native STAND, which is an evidenced-based inter-tribal curriculum that covers an array of sexual health topics. A pre- and post-assessment will be given to measure increased knowledge of information. A Likert Scale will be given to measure the quality of the program. Results: By April 2016, results will be established after the completion of the program. Conclusion: Implementing prevention programs can reduce the chances of AI youth from participating in unhealthy behaviors. Native STAND is effective program and should be implemented into multiple American Indian youth communities. *Moccasin Story: The Birds and The Bees* incorporates Native STAND and resilience to educate American Indian youth about health sexual, reproductive, and sexual behaviors.

McNulty, Elizabeth  
Jordan Affeldt  
**Faculty mentor:** Sumner Sydeman

**Session II, 2:00pm-4:00pm, 78A**  
**Title:** *Cognitive Behavior Therapy for Pediatric Obsessive Compulsive Disorder: A meta-analysis*  
The purpose of this paper is to present a meta-analysis on the efficacy of Cognitive Behavior Therapy (CBT) on pediatric Obsessive-Compulsive Disorder (OCD). After an extensive literature research, 11 articles were obtained regarding cognitive behavior therapy for pediatric OCD. The majority of these focused on family-based CBT and the others were other systematic reviews and meta-analyses. A meta-analysis will be conducted based on the evidence presented in each study, and will assist in determining whether family-based CBT is an effective method of treatment for Pediatric OCD.

Mead, Heather  
**Faculty mentor:** Bridget Barker
Session I, 9:00am-11:00am, 28A
Title: Culturing Coccidioides: Optimizing In Vitro Culture Media to Reflect Nutrient Availability in Vivo
The pathogenic soil dwelling fungi, Coccidioides immitis and C. posadasii cause an estimated 150,000 cases of coccidioidomycosis, also known as valley fever, in the United States each year. The current media for culturing spherules is not nutritionally representative of a mammalian respiratory system or conducive to in vitro immunology experiments. Supplemented RPMI media was used to produce the spherule form in a previous study. Using the supplemented media and an attenuated biosafety level two (BSL2) Coccidioides, preliminary trials were conducted to determine which factors, such as cell density, temperature, time, CO2 and O2 concentration, would affect spherule development. Potential conditions were identified, reproduced in triplicate, and compared to determine the most successful method of growth. The BSL2 strain cultured in the supplemented RPMI media successfully grew spherules at several conditions similar to the host environment. Spherule development between the two media types was relatively equivalent, and the highest percentage of parasitic morphology occurred at 15 % CO2. The supplemented RPMI media is an excellent candidate for culturing Coccidioides spherules and can be applied to future research in the BSL3 laboratory. The components of the media provide the organism with nutrients that are similar to those found in a host respiratory system at conditions which are favorable for in vitro immunology experiments.

Medina, Catherine
Faculty mentor: Marie Baker-Ohler

Session II, 2:00pm-4:00pm, 82A
Title: Intercultural Relationships: communicating identities
Intercultural relationships have continued to increase over the last three decades. More individuals are meeting through travels abroad and/or social network platforms. Intercultural couples often experience much different relational complications than others. Overcoming these complications and the cultural divide often causes a great deal of stress for partners, and impacts relational satisfaction. For the purposes of this paper, an intercultural relationship is defined as two individuals from two different nationalities, religions, ethnicity or race. Intercultural couples experience unique struggles as compared to romantic relationships with the same cultural background. This is in part due to the different set of values, habits and attitudes that are brought to the relationship by each individual. The purpose of this paper is to examine those unique struggles as caused by two different cultural identities and their system of beliefs. Using Barnett Pierce's concepts from coordinated management of meaning, which states that humans create and manage meaning through communication, the paper argues for the importance of intercultural competence in relationships. When a different cultural identity has been established for each partner these realities are continuously contested, therefore inhibiting couple's ability to find common ground in meaning and obtain less relational satisfaction. Rather than one dominant culture prevailing, partners should strive to partake in a continual process of identity negotiation in order to sustain personal identities as well as create anew with partners.

Melchor, Briaunna
Faculty mentor: Julie Moreau
**Title: Face Blindness and Affect Theory**
Using case studies from Harvard, this research will examine face blindness or prosopagnosia and how it relates to affect theory. Face blindness is when someone sees a face, say of their mother or sister, but they do not actually recognize that person as their relative because the emotional response associated with that person is lost. Harvard studies have shown that people with face blindness can't recognize the identity of the person, but they process emotions that the person is showing on their face with no hesitation. So, this research will examine if people with face blindness are able to recognize family members and friends through identifying their unique emotional facial expressions.

Melton, James  
Randon Allen, Tyler Richards, Nathan Ceniceros, Jessica Bauer, Jeremy Cook, James Melton  
**Faculty mentor:** David Willy, Karin Wadsack

**Session I, 9:00am-11:00am, 1B**

**Title: Department of Energy Collegiate Wind Competition, Mechanical Design**
The purpose of the project is to design a wind turbine for the Department of Energy's Collegiate Wind Competition. This presentation encompasses the mechanical aspect of the design.

Melton, James  
Randon Allen, Tyler Richards, Nathan Ceniceros, Jessica Bauer, Jeremy Cook, James Melton  
**Faculty mentor:** David Willy, Karin Wadsack

**Afternoon, 1:40pm-2:05pm, duBois Fremont Room**

**Title: Department of Energy Collegiate Wind Competition, Mechanical Design**
The purpose of the project is to design a wind turbine for the Department of Energy's Collegiate Wind Competition. This presentation encompasses the mechanical aspect of the design.

Meredith, Desiree'  
**Faculty mentor:** William Culbertson, Kimberly Farinella, Christina Valencia

**Session I, 9:00am-11:00am, 114D**

**Title: Iconicity on Educational Maps for People with Cognitive Disorders**
To study the effects of three varying degrees of iconicity among individuals having mild to moderate cognitive disorders, ten subjects responded to graphic symbols, in context photographs, and out of context photos of thirteen locations of the Flagstaff, AZ. arboretum map following a power point presentation. Subject responses included pointing, verbal identification and verbal stated preferences. Results suggested that iconicity had an effect on all response types.

Meyer, Rachel  
Carina Hall, Jason Sahl, Vanessa Theobald, Mark Mayo, Joseph Busch, Bart Currie, Sierra Jaramillo, Paul Keim, David Wagner  
**Faculty mentor:** Carina Hall

**Session II, 2:00pm-4:00pm, 26B**

**Title: Detecting melioidosis: development of MagPix assays to limit disease**
Burkholderia pseudomallei, the causative agent of melioidosis, is a gram-negative soil bacterium endemic to Southeast Asia and Northern Australia. Rapid and accurate identification of B. pseudomallei in clinical or soil samples has the potential to improve treatment options or assist in the identification of B. pseudomallei should it be used as a biological weapon. B. pseudomallei has many close relatives so we also need to include many near-neighbor strains in our panel. Due to frequent recombination within the B. pseudomallei genome, a wide variety of strains must be considered. We have developed molecular tools to allow for the detection and differentiation of B. pseudomallei and near neighbor species using the Luminex MagPix platform. The MagPix uses colored magnetic microspheres to identify each assay, allowing for the simultaneous screenings of multiple Burkholderia species targets per sample. Using four multiplex PCRs with a total of 50 targets, we examined the sensitivity of these assays by testing the limit of detection. We also screened 192 diverse samples within the Burkholderia genera to confirm the specificity of the 50 targets. We investigated the performance of each of the markers in their multiplexes by determining how sensitive and specific each target is. Overall, these tools will have the power to identify B. pseudomallei in both a clinical setting and in a malicious act of bio-warfare.

Miele, Margaret
Paige Wiley
Faculty mentor: Viktoria Tidikis, Gregory Busath

Session I, 9:00am-11:00am, 78C
Title: Correlation Between Academic Stress and Depressive Symptoms in Undergraduate Students
Increasing numbers of undergraduate students experience symptoms of depression. Students experience various stressors in their life as a college student. Each student reacts differently to the academic demands, ability to manage time, achievement expectations, and adjustment to independence as they navigate college life. Stress manifests itself in forms of depression. This study surveyed undergraduate students to determine the correlation between academic stress and depressive symptoms. Questions were asked about the number of credit hours, relationship to professors, study habits, time management, and self competency to measure the academic stressors. The stressors were then compared to symptoms of depression to determine the correlation. According to Andrews and Wilding (2004) there is a significant correlation between mental health issues of college students and academic stress. The importance of this present study is to identify the academic factors that contribute to depressive symptoms experienced by undergraduate students. Colleges and Universities can provide resources as potential support systems for students.

Mielke, Genevieve
Kira Farmer, Alisha Stalley, Allison Trottier, Victoria Izzo
Faculty mentor: Frederick Lampe

Session I, 9:00am-11:00am, 62A
Title: Applying Anthropology in Development of a Volunteer Outreach Program: the Food Recovery Network
The research focuses on developing a comprehensive Volunteer Outreach Program created for the Food Recovery Network, a non-profit national organization with a chapter in Flagstaff, Arizona. Their mission is to divert food, prepared on campus, from landfills and deliver it to local organizations that
will distribute it to community members in need of assistance. The research process involves identifying their volunteer outreach issues and using applied anthropological theories and frameworks to develop a successful theoretical action plan. The expected outcome is to provide the FRN with an applicable program that can be implemented in their future endeavors to increase their consistent volunteer base.

Miller, David

Faculty mentor: Eck Doerry

Session I, 9:00am-11:00am, 6B

Title: Simple Language Learning on a Single-Point Vibrotactile Interface

Multi-point vibrotactile interfaces have demonstrated significant capability in information transfer between human skin and computer systems. Applications have included drone piloting, spoken language learning for the Deaf, and sight recognition for the Blind. However, the hardwares for these applications are expensive, highly customized, and complicated. This project employs a single-point vibrotactile interface on existing commercial hardware. Namely, Android smartphones and smartwatches. The experimental procedure of this study attempts to measure language learning and information transfer by taking care of a digital pet that communicates through a single-point vibrotactile interface.

Miller, Elise

Cheyenne Franklin, Alexandra Padilla, Jonathan Van En

Faculty mentor: Jay Sutliffe

Session I, 9:00am-11:00am, 115A

Title: Nissan Subaru Dealership Wellness & Nutrition Intervention

The Nissan Subaru Dealership Wellness & Nutrition Intervention is a three week program designed to provide participants with information and tools to make healthier nutrition choices. Through our program we intend to provide Flagstaff Nissan/Subaru participants with the knowledge and skills to improve adherence to the National Dietary Guidelines by 25% by April 10, 2016. This goal will be evaluated with pre and post surveys. The largest health behavior problem among the target audience is over-consumption of unhealthy processed foods (fast food). This over-consumption has lead to insufficient adherence to the National Dietary Guidelines. Dietary Guidelines are designed to help families to eat healthy nutrient-dense meals (United States Department of Agriculture, 2015). The World Health Organization (2015) states that a healthy diet and moderate physical activity decrease health risks for conditions like cardiovascular disease, cancer, and diabetes. Total fat intake for adults should be limited to 30% total calorie intake while limiting added sugars to less than 10% and limit added salt to one teaspoon. Limiting caloric intake from fast foods can lower intake of unwanted trans fats and added salts (WHO, 2015). By providing the Nissan Subaru Dealership Wellness & Nutrition program participants with fun, interactive, easy food demonstrations, food journals, and skills to make healthier choices, we will be able to increase social support and self-efficacy, helping individuals adhere to the National Dietary Guidelines. Additionally, we can connect participants to resources in the community that can enable them to continue making improvements in their health.

Miller, Shelby
Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 95D

Title: Behavior Change: improving Time-Management and Productivity
This project explores one's ability to successfully adapt and change a selected behavior. In this project I worked to change my behavior and implement new habits and organizational tools to improve my own ability to manage my time and to increase the efficiency of my task completion, particularly as it applies to the completion of assigned homework and classwork.

Mills, Talon
Faculty mentor: David Richter, Perry Wood

Session II, 2:00pm-4:00pm, 106D

Title: Developing an inexpensive cart to carry Precision Agriculture and phenotyping instrumentation for developing nations
Currently, securing the food supply is a global concern, with additional distress on developing nations because of the danger of famine. Corn, in particular, is one of the largest produced crops across the world because of the calories produced per acre. Developing nations need a way to increase the yield of corn without wasting resources to maximize profits and, ultimately, food security. Precision Agriculture utilizes measurements of the physical characteristics of plants to determine what resources are needed to increase yield. Measuring a plant's physical characteristics to examine how the genes of the plant are affecting growth and yield is phenotyping. The use of phenotyping allows farmers to apply specific fertilizers and amounts of water based on the needs of the plants throughout their life cycle, from germination to maturation. While Precision Agriculture and phenotyping seem like an ideal solution, the instrumentation is expensive, and the platforms to carry the instrumentation are also expensive and not necessarily design for the height of corn. For this project, the team focused on solving the issues of the cart height and expense. Using recycled materials and little funds, the team designed a push cart which looks like two parallel A's with wheels on the bass and a brace connecting the tops. The team proposes the cart is able to span a row of corn without touching the plants during data collection, providing an inexpensive solution bring Precision Agriculture and phenotyping to developing nations.

Mireles, Jose
Marissa Bell, Aaron Childers, Adam Clark, Jesse Sunderland, Zackary Remley
Faculty mentor: Doug Holland, Julie Heynssens

Morning, 11:10am-11:35am, duBois Southwest Room

Title: NASA ZigZag Particle Beam Imaging System
A radiation testing system has been designed to collect data from biological cells that have been exposed to radiation. Researchers at other universities will be able to analyze the data that will be used for cancer cell research and space exploration. This project is a continuation of a single sensor design completed by another NAU team from the previous year. The new Particle Beam ZigZag imaging system added three additional sensors in a zigzag pattern. All four sensors will collect data simultaneously to ensure more accurate results. The design used the Cadence software to create schematics and printed circuit board layouts. Matlab and Quartus II were used to program the boards.
Overall, a system has been designed to collect more accurate data from radiation exposure in order to benefit cancer cell research and the study of the effects of space radiation.

Molina, Lucas
Faculty mentor: Matthew Bowker, Michael Stoddard

Session I, 9:00am-11:00am, 17C
Title: Litter Analysis of Long-term Treatments on a Ponderosa Pine Forest: Litter Amounts, Oxygen Isotopes, and Climate Change
Litter analysis is an important tool used to identify and describe nutrient deficiencies in trees. Analysis of ponderosa pines (Pinus ponderosa) litter in Northern Arizona can reveal an intricate relationship between tree productivity, health, and climate patterns. These factors are highly dependent on year-to-year climate variation. By the year 2050, climate change models predict temperatures will be higher than the annual average temperature by 2(°C)-6(°C) Celsius. These predicted changes may affect the biological processes of trees and forests. A project in Northern Arizona was implemented in 1994 to quantify the effects of multiple management practices on stands of varying densities. This long-term experiment and its associated litter will provide new insights into the forests' ability to withstand increasing temperatures and decreasing water availability. Litter weights and isotopic compositions between forest thinning treatments will be used to test the hypothesis that there is a direct impact on tree health and productivity from the changes in climate over the past 20 years.

Montero, Matthew
Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 127D
Title: An Auto Ethnographic Approach to Law Enforcement and Community Relations
This project will be centered around my personal career plans post-graduation which is becoming a law enforcement officer, while incorporating an Auto ethnography methods approach. In receiving two minor in anthropology and criminal justice and completing the BUS program at Northern Arizona University give me the ability and insight to be a more effective in my duties as an officer. The anthropological viewpoint gives me the opportunity to view issues such community and police relationship that may play a role in police genocide.

Montgomery, Lindsy
Sierra Smith, Fahad Alzahrani, Ernesto Sanchez
Faculty mentor: Tricia Moore

Session I, 9:00am-11:00am, 110B
Title: Compliance with Oral Care Referrals: Older Adults in a Rural Northern Arizona Community
Purpose: The purpose of this study was to discover resources available for continuity of care for needs identified through screening older adults in a rural community in Northern Arizona and to determine the referral compliance of screening participants. Methods: A survey identified oral health care providers in the community who offer cost reduction options. Dental hygiene students and dentists provided an oral health screening at an adult center in a rural community. Hard tissue conditions (tooth decay) and soft tissue conditions (periodontal disease and oral lesions) were identified and education
and referrals were provided accordingly. A follow-up survey 10 weeks after the screening determined compliance with referrals. Results: The return rate for the provider survey was 18%. Seventy-seven percent of the providers who returned surveys offered cost reduction services. Of the 19 older adults screened 68% had decay, 26% needed extractions, 100% were in need periodontal care, and 5% had oral lesions. Thirty-three percent of participants complied with the referral provided. The primary reason reported by participant's that did not seek care was lack of financial resources. Conclusions: Though many dental providers routinely offered some type of cost reduction, very few were willing to provide additional reduced cost care to participants in the dental screening. The prevalence of oral disease is high in the older adults of Northern Arizona, with 100% having disease of soft tissues and 68% having disease of hard tissues. Even with a customized referral list, few participants sought the treatment they needed.

Moore-Sharp, Marc  
Faculty mentor: Julie Moreau

Session I, 9:00am-11:00am, 81D  
Title: The Role of Shame in Interracial Relationships  
The use of affect theory is relatively new in the modern academy. Scholars have described affect as the biological drives, impulses, and motivations behind our emotions. Emotions are not the same as affects, however. Emotions are our personal socio cultural negotiations of emotions, and affects are the root causes. In other words, affect is biology, emotion is biography. Affect theorists often discuss how affect is racialized, and in this project, I used affect theory to analyze the role of the affect of shame in interracial relationships. The methods used were the examining of texts by a variety of affect theorists, as well as empirical studies on interracial relationships. The studies found that those engaged in interracial relationships were no more likely to experience relationship problems than intraracial relationships, but many people of different races were still apprehensive to be in interracial relationships. I also found that young people engaged in interracial relationships were less likely to inform their family, and were thus more likely to experience relationship disruption. I examine the possible role that the affect of shame plays in this data from an affect theory perspective.

Morales, Jordan  
Faculty mentor: Nora Timmerman

Afternoon, 1:15pm-2:00pm, Skydome Stage B  
Title: Integrating Critical Pedagogy and Civic Education in Today's Classrooms  
In this research endeavor, I explore two topics within the field of education: civic engagement and critical pedagogy. Civic engagement is a field of study in which students explore how to incorporate community issues and civic action in order to improve the world around them. Critical pedagogy is a teaching methodology in which teachers ask students to critically evaluate questions of power and privilege. Through my research, I look at how these two topics overlap, and I evaluate some of the barriers as well as the possibilities for implementing critical civic engagement in Arizona schools.

Mori, Danielle  
Faculty mentor: Julie Moreau
Session I, 9:00am-11:00am, 81B

Title: Use of Rage to Decolonize Space
Applying Affect Theory to think about how people can use rage to decolonize spaces they occupy.

Morita, Jay
Robert Kasper, Mohammad Aljoilan
Faculty mentor: Kyle Winfree

Session II, 2:00pm-4:00pm, 5C

Title: Preventing Falls: Real-Time Analysis of Abnormal Walking Characteristics
The study of a person's gait, the pattern of how a person walks, can reveal characteristics that may be employed to identify when one is at risk of falling. Traditionally, identifying one that is at risk of falling has been dependent on self-report measures or clinical assessments. Other solutions use intrusive and bulky equipment. In this project report, we present a non-intrusive system composed of multiple sensors that will identify abnormal gait patterns based on analysis of walking sounds. Inexpensive microphones are placed in multiple positions around the room to obtain recordings of people walking normally and with different types of abnormal gait. We extracted control envelopes from the recorded audio signals and used algorithms to compare the recordings with a baseline recording of a person's normal gait pattern. Variables such as floor type, shoe type, and walking distance were controlled to obtain the best possible accuracy and precision for each audio recording. Based on the signal analysis of the recordings, we show that the gait characteristics and parameters obtained using the acoustic gait profile can reliably detect and recognize abnormal gait. With a non-intrusive system that will analyze gait in real time, we can identify gait and posture related pathologies early on, observe the degree of recovery in stroke victims, and provide faster aid to those that are in risk of falling or have fallen.

Morita, Jay
Robert Kasper, Mohammad Aljoilan
Faculty mentor: Kyle Winfree

Morning, 8:55am-9:20am, duBois Southwest Room

Title: Preventing Falls: Real-Time Analysis of Abnormal Walking Characteristics
The study of a person's gait, the pattern of how a person walks, can reveal characteristics that may be employed to identify when one is at risk of falling. Traditionally, identifying one that is at risk of falling has been dependent on self-report measures or clinical assessments. Other solutions use intrusive and bulky equipment. In this project report, we present a non-intrusive system composed of multiple sensors that will identify abnormal gait patterns based on analysis of walking sounds. Inexpensive microphones are placed in multiple positions around the room to obtain recordings of people walking normally and with different types of abnormal gait. We extracted control envelopes from the recorded audio signals and used algorithms to compare the recordings with a baseline recording of a person's normal gait pattern. Variables such as floor type, shoe type, and walking distance were controlled to obtain the best possible accuracy and precision for each audio recording. Based on the signal analysis of the recordings, we show that the gait characteristics and parameters obtained using the acoustic gait profile can reliably detect and recognize abnormal gait. With a non-intrusive system that will analyze gait in real time, we can identify gait and posture related pathologies
early on, observe the degree of recovery in stroke victims, and provide faster aid to those that are in risk of falling or have fallen.

Morris, Breana  
**Faculty mentor:** Brandy Judson  
**Session II, 2:00pm-4:00pm, 95D**  
**Title:** Changing My Sleeping Habits  
For this project I chose to change my behavior of my sleeping habits. I spent a lot of time sleeping instead of being productive. Instead of sleeping more than ten hours a day, I wanted to ensure I was getting the average eight hours of sleep instead. So over ten weeks I tracked my progress on changing this behavior and noticed results in my productivity. I will be presenting on what I chose to change, the obstacles I faced, and my progress during this time.

Morrow, Caleigh  
**Faculty mentor:** Melissa Birkett, Lucas Klein  
**Session I, 9:00am-11:00am, 129A**  
**Title:** Effects and Efficiency of Music Therapy  
My project will explain the basics of music therapy, as well as its different effects on patients. I will also explain terminology of this practice and different approaches to different mental issues. My goal is to find specific accounts of people going through music therapy in my research to show the efficiency or inefficiency of this therapy.

Morse, Victoria  
**Faculty mentor:** Amber Nicole Pfannenstiel  
**Morning, 10:30am-11:30am, Skydome East Concourse - ADA section**  
**Title:** The Playful Rhetoric of Lost Pinups  
Through social media there is a mass of communication outlets that are constantly being sent out and there is no way to concisely monitor what goes on. By focusing on the Lost Pinup community found of Facebook, with the use of memes and the options to react to the media there could be a trend found in a single community. Making use of what is appreciated in a community and what is seen as less significant in a specific community to understand the importance of memes, its impact on social media, and personal relations.

Moss, Sean  
Bryan Stephens, Mariah Miller  
**Faculty mentor:** Viktoria Tidikis  
**Session I, 9:00am-11:00am, 78D**  
**Title:** Pet Ownership in Relation to Stress Levels in College Students  
I am conducting an experiment to see whether owning a pet affects stress levels in college students. My group and I have made a survey that will be given out to around 50 research methods students. The
survey includes questions involving owning a pet and questions involving stress. The hypothesis is that college students who own a pet have lower stress levels than students who don't.

Moya Gonzalez, Isabel  
Stephen Shuster, Rebecca Beresic-Perrins  
**Faculty mentor:** Stephen Shuster, Rebecca Beresic-Perrins

**Session I, 9:00am-11:00am, 25D**  
**Title:** Selection on brood size in the leech Helobdella modesta

Helobdella modesta is an Arizona leech that provides extensive postzygotic parental care to its offspring. Parents carry their broods on their ventral surface until progeny become independent (mean brood size ± SD=12.0 ± 6.5, N=26). To study the response in this species to directional selection on high and low brood size, we allowed 65 wild-caught (P1) individuals to breed to release their progeny. We separated the F1 leeches into individual containers to prevent cross-fostering and established 53 breeding groups of 8 non-sibling leeches. When F1 leeches became gravid, we separated them again into individual containers and ranked them by brood size. We identified the largest (13 offspring) and smallest (8 offspring) families, and at independence separated F2 individuals into non-sibling breeding groups of 8. When the F2 became gravid, we separated leeches into individual containers, ranked them by brood size, and then established 5 non-sibling breeding groups each from within the large and small families, respectively. We used ANOVA to compare the average brood sizes of P1, and high and low F1 and F2 parents. We found that the average brood size of large F2 families was larger than that of F1 and P1 families. Inadequate sample size prevented this comparison for small F2 families. Our results suggest that brood size is heritable in H. modesta.

Mujica-Steiner, Michaela  
**Faculty mentor:** Julie Moreau

**Session I, 9:00am-11:00am, 77D**  
**Title:** Affective Production Through Neoliberal Economic State Transformation

My research uses affect theory to examine the proliferation of neoliberal philosophies within both right-wing and left-wing American political think tanks as it relates to two key issues: climate change and women's reproductive rights. The two right-wing think tanks I examine are The Heritage Foundation and Americans for Prosperity. The two left-wing think tanks I examine are The Center for American Progress and the Center on Budget and Policy Priorities. Specifically, my research aims to locate what affects are evoked by right-wing versus left-wing American political think tanks in regard to the promotion of a neoliberal philosophy and politic. Within my research, I locate differences and similarities in affect evocation regarding issues of climate change versus women's reproductive rights and I approach neoliberalism with a focus on state transformation. Hence I investigate how neoliberal approaches to both climate change and women's reproductive rights criminalize the public sphere through the affective state of public shame being transformed into a carceral manifestation through the neoliberal economic process. I analyze and map this affective transformation through the proliferation of neoliberal economic rhetoric on think tank websites, bringing particular attention to how a shaming of the public sphere horizontally protects private societal entities in the advancement of a carceral state.
Munsch, Parker
Nathaniel Phillips, Karli Crocker, Marissa Gallagher
Faculty mentor: Lisa Tichavsky

Session I, 9:00am-11:00am, 102B

Title: Measuring academic success and drug use amongst college students.
This study will look at recreational drug use on campus and how it effects the academic success of the students. We surveyed 100 students asking about their recreational drug use (i.e. the use of illegal drugs such as marijuana, cocaine, and LSD), academic standing (determined by grade point average, scholarships, and academic awards), and self-control (Grasmick, Tittle, & Ward, 1993). We utilize OLS regression to compare the relative effect of a student's level of self-control to the effect of recreational drug usage on their academic standing. We predict that students with higher drug use will have a lower academic standing. We also expect to find that students with lower levels of self-control will score lower on academic standing than students with higher levels of self-control. The results and conclusions of the study are in progress but will be provided.

Munyon, Lacey
Riley McAuliffe, Amber Jones, Austin Vanderveen
Faculty mentor: Lisa Tichavsky

Session II, 2:00pm-4:00pm, 102B

Title: Rationalizing the Death Penalty
Utilizing deterrence theory, this study investigates the role gender identity, political affiliation, racial attitude scales, and racial identity plays on an individual's opinion of the death penalty. We are investigating this issue because opinion on the death penalty may expose misinformation about the subject and may eventually influence legislation. We hypothesize that those who identify as Republican are more likely to favor the death penalty using the Capital Punishment Survey Report (Kamis, 1996). We drafted and administered an anonymous survey to 150 students at a midsize Southwestern university. This survey examines how knowledgeable students are about the death penalty, as well as their opinion on this subject controlling for demographic characteristics. The results and conclusions of the study are in progress but will be provided.

Musni, Jobelle
Marcario Betoney, Hanan Alghamdi
Faculty mentor: Tricia Moore

Session I, 9:00am-11:00am, 110C

Title: An Educational Intervention on the Oral-Systemic Health Connection for Nurse Practitioners
Periodontal disease is an inflammatory condition that affects almost half of adults in the United States. Several studies suggest connections between periodontal disease and systemic conditions such as diabetes mellitus, cardiovascular disease, respiratory disease, and adverse pregnancy outcomes. The goal of this project was to provide an educational intervention for Flagstaff nurse practitioners on the connection between periodontal disease and systemic conditions. A one-hour educational program about the oral-systemic health connection was presented to twenty Flagstaff nurse practitioners. A
confidential questionnaire was administered before and immediately after the presentation to assess baseline knowledge and attitudes as well as the effectiveness of the educational intervention. The educational program resulted in significant improvement in the nurse practitioners' knowledge and behavioral intentions. This study suggests that an educational program for nurse practitioners on the relationship of oral and general health increased their knowledge and behavioral intentions with respect to referral for treatment of periodontal disease.

Nadeau, Hannah
Faculty mentor: Brandy Judson

Session II, 2:00pm-4:00pm, 100B
Title: Behavior Change
The behavior that I decided to change in my own life and for this assignment was my caffeine intake. I would like to limit my caffeinated beverages to only 1 to 2 times a week by the end of the semester. Instead of always turning to surgery drinks such as coffee and soda, my goal is to substitute healthier options such as decaf tea with lemon or honey. In order to do this I've come up with a list of steps and a way to measure and track my progress that will help me reflect on the changes that I make and the areas that need improvement.

Nagel, David
Justin Poehnelt, Jack Burrell, Ahmad Meer
Faculty mentor: Omar Badreldin, Kyle Winfree

Session II, 2:00pm-4:00pm, 6A
Title: Mobile Data Collection
Today there exist many wearable devices that collect data on how individuals move and exercise. While devices like FitBit, and Jawbone can track things like heart rates, distance and footsteps, they do not collect data on a person's gait, particularly foot rotation, stride, and weight distribution. Other gait analysis tools do exist, but are often limited to the clinical environment, and do not allow for easy access to its data. Our wearable device with numerous sensitive resistors uploads collected data through a custom mobile phone application that can manage many wearable devices. Ultimately the mobile device uploads the data to a central server allowing for near-real-time feedback and analysis. Gathering data from wearable devices outside of a clinical setting can lead to a number of discoveries for Parkinson's disease. Primarily early diagnosis and an improved assessment of efficacy of medications over a long period of time outside of the clinical environment.

Nagel, David
Justin Poehnelt, Jack Burrell, Ahmad Meer
Faculty mentor: Omar Badreldin, Kyle Winfree

Morning, 10:45am-11:10am, duBois Meadows Room
Title: Mobile Data Collection
Today there exist many wearable devices that collect data on how individuals move and exercise. While devices like FitBit, and Jawbone can track things like heart rates, distance and footsteps, they do not collect data on a person's gait, particularly foot rotation, stride, and weight distribution. Other gait
analysis tools do exist, but are often limited to the clinical environment, and do not allow for easy access to its data. Our wearable device with numerous sensitive resistors uploads collected data through a custom mobile phone application that can manage many wearable devices. Ultimately the mobile device uploads the data to a central server allowing for near-real-time feedback and analysis. Gathering data from wearable devices outside of a clinical setting can lead to a number of discoveries for Parkinson's disease. Primarily early diagnosis and an improved assessment of efficacy of medications over a long period of time outside of the clinical environment.

Najera, Brandon  
**Faculty mentor:** Brandy Judson

**Session I, 9:00am-11:00am, 94A**  
**Title:** Increasing Happiness Using The Best Possible Self Technique  
In the past decade, state of mind and its connection to overall physical health has been a hot topic in the medical world. Countless studies have been done that show that state of mind does indeed play a big role in things like illness and disease. This project focuses directly on happiness and optimism. Realizing that being unhappy all the time can possibly lead to heart disease or cancer, I decided to try to change it. Using a technique called the Best Possible Self exercise, I attempt to increase my level of happiness and optimism.

Navarrete, Priscila  
Kojun Kanda, Lucio Sanchez, Aaron Smith  
**Faculty mentor:** Aaron Smith

**Session I, 9:00am-11:00am, 33C**  
**Title:** A preliminary molecular phylogeny of the genus Stenomorpha (Coleoptera: Tenebrionidae) shows rampant subgeneric paraphyly  
Stemonorpha (Tenebrionidae: Piemliinae: Asidini) is a morphologically diverse genus of flightless desert beetles endemic to western North America. The genus now contains 171 described species, with many considered dubious due to reliance on adult dorsal characters that are under selective pressure. In order to construct a preliminary phylogeny for the genus, we sequenced three mitochondrial (COI, COII, 12S) and five nuclear (28S, H3, wg, ArgK, CAD) genes for 100 specimens representing over 80 species and conducted phylogenetic analyses using maximum likelihood methods. The phylogeny shows that Stenomorpha as currently defined is polyphyletic with respect to other Asidini. We recovered support for a number of morphologically defined species groups and discovered that some species that show great morphological variation across their geographic distribution may represent complexes of cryptic species. Overall, this study demonstrates the need for extensive taxonomic revision of Stenomorpha and related genera.

Nazario, Isabel  
Joshua Gonzalez  
**Faculty mentor:** Douglas Sutton

**Session I, 9:00am-11:00am, 119D**
Title: Replacing Peripheral Intravenous Catheters in Adult Medical Surgical Patients and the Incidents of Phlebitis

Intravenous therapy is a common practice in the hospital. Peripheral venous catheters (PVCs) (also called IV lines) are placed within patients to mainly administer medication, nutrients, fluids, blood products or dyes and contrasts. It is estimated one in three hospitalized patients will need an IV. The insertion of PVCs are associated with phlebitis, which is the inflammation of the vein wall. Signs and symptoms of phlebitis are identified by the following symptoms: pain, redness, heat, and swelling. Incidents of phlebitis can lead to further risk for infection and can lead to death. Replacement of PVCs are required to continue intravenous therapy; however, this intervention can further increase the risk for phlebitis. The CDC recommends that PVCs are to be replaced every 72 to 96 hours. Conversely, the practice at Northern Arizona Healthcare states to replace PVCs based on the assessment of a PVC, a practitioner's order, or frequent complications such as occlusion. The aim of this project was to determine if PVCs, when replaced for a clinical reason such as infiltration, pain or swelling, results in a lower incidents of phlebitis in adult patients compared to routinely replaced PVCs. By improving current IV practices and implementing best practice it will inadvertently improve patient outcomes as well.

Nelson, Jeannette
Margaret Wisman, Adam Barad, Brittnee Barrett, Logan Bacher
Faculty mentor: Sarah Oman

Session II, 2:00pm-4:00pm, 1A

Title: Hozhoni Art Program Assistive Easel

The Hozhoni Foundation is a local Flagstaff organization supporting individuals with mental and physical disabilities. A key program offered at the Foundation is the art program, allowing clients to express themselves through various art forms. The Hozhoni Foundation came to the Engineering Department at NAU seeking an assistive art easel- something not currently possessed by the program. This easel must be adjustable for a variety of individuals, including those confined to a wheelchair and allow for a variety of different positions. The easel has been analyzed for force distribution, stability, and comfort and built to these standards. Working as a team of engineering undergraduates with the input of both professors, medical professionals, and the Hozhoni Foundation and clients, the easel was designed and constructed during the course of the academic year 2015-2016.

Nelson, Jeannette
Margaret Wisman, Adam Barad, Brittnee Barrett, Logan Bacher
Faculty mentor: Sarah Oman

Morning, 10:20am-10:45am, duBois Fremont Room

Title: Hozhoni Art Program Assistive Easel

The Hozhoni Foundation is a local Flagstaff organization supporting individuals with mental and physical disabilities. A key program offered at the Foundation is the art program, allowing clients to express themselves through various art forms. The Hozhoni Foundation came to the Engineering Department at NAU seeking an assistive art easel- something not currently possessed by the program. This easel must be adjustable for a variety of individuals, including those confined to a wheelchair and allow for a variety of different positions. The easel has been analyzed for force distribution, stability,
and comfort and built to these standards. Working as a team of engineering undergraduates with the input of both professors, medical professionals, and the Hozhoni Foundation and clients, the easel was designed and constructed during the course of the academic year 2015-2016.

Nelson, Shannon
Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 125D
Title: The Study of the Growth of Tennis In Japan
The popularity of the sport, tennis, is slow in Japan, but growing. I want to learn why tennis has grown slowly there, why it is becoming a popular sport, and what areas have the biggest growth.

Newell, Michael
Tinna Traustadottir, Aaron Done, Travis Cluckey
Faculty mentor: Tinna Traustadottir

Session II, 2:00pm-4:00pm, 25B
Title: Exercise Redox Signaling: Intensity Matters
As medicine continues to advance at preventing age related diseases, the significance of oxidative stress cannot be over looked. Oxidative stress is caused by an imbalance between the production of reactive oxygen species (ROS) and the body's ability to detoxify them. This imbalance has been linked to numerous diseases such as cardiovascular disease, Alzheimer's, and cancer. Some of the key factors involved in the body's defense against ROS are the master regulatory protein (Nrf2) and the enzymes (GR) and (SOD). It is well documented that although aerobic exercise increases the production of ROS, it also greatly improves the body's natural defense system. The purpose of this study is to compare the amount of oxidative stress generated and the response of Nrf2 and the two enzymes between two different exercise intensities of the same duration; cycling with a constant workload and high intensity interval cycling.

Nez, Rashaun
Rashaun Nez, Emily Hunt
Faculty mentor: Frederick Lampe, Taylor Genovese

Session I, 9:00am-11:00am, 67B
Title: Decolonizing the Indigenous Mind
The information for the topic of decolonization is inspired by For Indigenous Eyes Only; A Decolonization Handbook. It is through this book that we focus on critical thinking strategies, hands on applications, and empowerment exercises to decolonize ourselves using culturally specific Indigenous methods. This 'hands-on' approach allows willing participants to actively engage within their respective cultures and question their place among the 'established' colonized world they now live in. The questions being asked will cover education, tribal sovereignty, governance, language, oral tradition, stereotypes, diets, and self-perception. It is important that we ask ourselves where we fit in this world that was not made for us, and to do so using our own cultural values. We must reach out to those in our community or family to better explain our unique situation, using our Indigenous language and ideologies to fully grasp our role within colonization. From the perspective of our specific cultures
can we see the effects that colonization has had on us, and then we as colonized people can formulate a plan to effectively combat the system of colonization.

Nez, Wayne - CANCELLED
  Victor Jimenez, Fernando Monroy
  Faculty mentor: Fernando Monroy, Victor Jimenez

Session I, 9:00am-11:00am, 28A
Title: The Effects of Alcohol in Macrophage-Pseudomonas Aeruginosa-Burkholderia Thailandensis
Alcohol consumption has been associated with a suppressive effect on the human immune system and an increased susceptibility to infection with pulmonary pathogens. Alveolar macrophages play a crucial role in preventing infection by capturing and removing pathogens from the lung environment. For this study, we used mouse alveolar macrophages and the Gram negative bacteria Pseudomonas aeruginosa and Burkholderia thailandensis to determine the effects of alcohol on the pathogen and the ability of macrophages to control the infection with ‘alcoholic bacteria’ in vitro. We hypothesized that alcoholic bacteria would survive better in macrophages because of their inability to generate high levels of nitric oxide and decrease intracellular killing ability. Bacteria were cultured in Luria-Bertoni (LB) broth with alcohol concentrations of 0, 0.08, and 1%. To determine macrophage function, alveolar macrophages were activated with 400 U/ml interferon (IFN) and followed by 1 L of 1 mg/mL lipopolysaccharide (LPS). The cell monolayer was then infected with the alcoholic bacteria at a .5:1 ratio for the nitric oxide level assay; supernatants were collected 3, 6, 9, and 12 hr post infection to determine nitric oxide concentrations by the Griess test. In the survivability assay macrophages were infected at a 1:1 ratio. Macrophage monolayers were lysed and diluted before plating on LB agar plates to measure the survivability of the engulfed bacteria. Macrophages exposed to Pseudomonas aeruginosa with acute ethanol exposure increased NO production at 3 hr., with a peak production at 6 hr., and a dramatic decrease at 9 and 12 hr post-infection. With increasing concentrations of alcohol so did nitric oxide levels at the 6 hr time point. Moreover, an acute ethanol exposure to Pseudomonas aeruginosa increased macrophage nitric oxide production at 6 hr. Taken together, these results suggest that ethanol exposure to bacteria has the ability effect macrophages nitric oxide production ability and possibility of increasing the survivability of intracellular bacteria. Macrophages infected with Burkholderia thailandensis at 0% alcohol concentration had peak nitric oxide levels at 6 hr. and with acute ethanol exposure at 1% peak levels were observed at 9 hr. which is different in comparison to Pseudomonas aeruginosa.

Nguyen, Sandy
  Faculty mentor: Trina Spencer, Meghan Moran

Session I, 9:00am-11:00am, 92C
Title: Linguistic Complexity in Spanish/English Dual-Language Children’s Books
It is long accepted that reading aloud to children from children's books is an integral part of child language development (Horst & Houston-Price, 2015), partially because children's books contain a greater amount of linguistic complexity (in the form of type-token ratios) than child-directed speech (Montag, Jones, & Smith, 2016). However, few studies have examined the linguistic complexity of bilingual (i.e., Spanish/English) children's read-aloud literature. The purpose of the current study is to
analyze the lexical and grammatical complexity of 75 English and Spanish bilingual children's books (the Bilingual Book Corpus) using corpus linguistic tools. The corpus contains both direct translations and looser translations of books intended to be read to and/or with children in pre-K through 3rd grades. As such, the following research questions were explored: Are there differences between the English and Spanish translations in terms of linguistic complexity (e.g., type-token ratios, numbers of modifiers, relative clauses, etc.)? Are there differences in linguistic complexity between the direct translations as opposed to the books' own (i.e., looser) translations? This study can determine the books' potential benefits for children who are exposed to these books in school or home settings.

Nichols, Elizabeth  
Faculty mentor: Michael Rulon

Afternoon, 3:15pm-3:30pm, Liberal Arts (Bldg #18) Room 120

Title: Gendered Terror: Orientalism in French News Representations of Islamic Terrorism

When discussing colonialist texts referencing colonized 'others' by western colonizing powers, depictions of colonized peoples are often considered to submissive, feminized, and deserving of the west's masculine exertions of power over them. Language concerning the feminized 'east' and the masculine 'west' appear throughout Edward Said's vital work, Orientalism, and serve as a base for this project's research in conjunction with several more modern discussions of orientalism and post-colonialism. This project looks specifically at French depictions of terrorist acts performed by Islamic extremists in the news today, primarily the terrorist attacks of September 11, Charlie Hebdo, and the Paris Attacks, and examines gendered interpretations of Europe/America and the Middle East in these narratives. This paper argues that French depictions of Islamic terrorist attacks have reversed previous, colonial gender roles assigned to these regions, and instead made the 'former'-colonizer of Europe/America a character of innocence which is victimized, and even raped, by an aggressively masculine Middle East. This paper also argues that this reversal of gendered regions is a result of decolonization anxieties, and specifically France's reluctance to let go of its colonies after World War Two, resulting in its wars with Algeria and Vietnam.

Nicol, Jared  
Jake Nelson, Jennifer David, Brooke Fulco, Bryson White  
Faculty mentor: Lisa Tichavsky

Session I, 9:00am-11:00am, 102C

Title: Stimulants and Their Relation to Academic Success

Stimulant drugs are increasingly becoming popular throughout colleges nationwide. Our objective is to examine the effects of the use of stimulants on academic success. While some drugs are known to lower academic success, the use of stimulants might actually increase student success. Therefore, we surveyed 100 students at a mid-sized Southwestern university, asking questions related to academic success, stimulant usage, and stress as well as other demographic characteristics. We utilize OLS regression to test the hypothesis that increased stimulant usage will increase student academic success while controlling for levels of self-control. Higher levels of self-control might be a factor in student success independently of stimulant usage. Additionally, we test the possibility of an interactive effect of stimulant usage and self-control. Our results and discussion are in progress but will be provided and the implications discussed.
Nizalowski, Isadora  
**Faculty mentor:** Zsuzsanna Gulacsi

Session I, 9:00am-11:00am, 53B  
**Title:** *A Typology of Hokusai's 'Thirty-Six Views of Mount Fuji'*

The study shows that this woodblock print series, created in the Edo period (1615-1868 CE), show elements that were important to their society spiritually, which were Mount Fuji, nature, and humanity. Setting aside that Mount Fuji is the namesake for the prints, it appears in varying focus throughout the pieces, which implies that Mount Fuji's importance is tied into nature and humanity. With the varying focus on these elements, it brings to light different perspectives to Edo period Japan's spiritual beliefs.

North, Caroline  
Luke Chiverton, Whitney Young, Jenna Girdosky, Timothy Broom, Nora Dunbar  
**Faculty mentor:** Nora Dunbar

Session II, 2:00pm-4:00pm, 78B  
**Title:** *Does Professor-Student Rapport or Autonomy-Support Mediate Students' Abilities to Accurately Predict Their Final Grades?*

This study examines possible mediators between students' expected final grade in a course and their actual final grade in the course. Specifically, professors' autonomy support, and two aspects of professor-student rapport will be examined as factors that may explain the discrepancy between the student's predicted final course grade and their actual final course grade. Previous literature has shown that instructors' autonomy support and professor-student rapport influence students' expected and final grade. The specific questions being researched are as follows: Do the constructs listed above mediate the relationship between expected grade and actual grade? That is, does a student's ability to accurately predict their final grade in a course work in part through positive perceptions of their relationship with the professor and/or the extent to which the professor nurtures and builds students' inner motivational resources? If such a relationship should be found to exist, what is its magnitude? Our hypothesis is that all three constructs will emerge as partial mediators, and the instructors' autonomy support will display the strongest association. Data was collected from 765 undergraduate students in 18 undergraduate courses towards the end of the Fall 2015 semester. The classes were 100-level, 200-level, and 300-level courses from the Psychological Sciences, Criminology and Criminal Justice, Biology, and English Departments. The final sample used was 653 students who waived their FERPA rights and for whom final grades were provided by their instructors. A regression analysis will be used to analyze the data, and bootstrapping will be used to test for mediation.

Norton, Robert  
**Faculty mentor:** Dierdra Bycura, Akaylah Jaeke

Session I, 9:00am-11:00am, 115B  
**Title:** *Biggest User Case Study Measuring Changes in the 5 Components of Fitness*

The purpose of this project was to examine the effectiveness of small group training sessions in a university campus recreation program by assessing changes in health related components of fitness over time. **Method:** The Biggest User was a 10-week healthy lifestyles program that promoted
physical activity and proper nutrition. The program was delivered at Northern Arizona University Campus Recreation. Participants (N = 25, 3 Males, 22 Females) were NAU employees, faculty staff and students varying in age ( ) and physical fitness level. During the program participants took pre-fitness and post-fitness tests as well as partake in 18 small group personal training sessions. Small group training sessions and fitness assessments were conducted by NAU personal trainers who are nationally certified. These fitness tests assessed the 5 components of fitness (cardiorespiratory endurance, muscular strength, muscular endurance, flexibility and body composition). Pre-post assessment results were gathered to evaluate if partaking in small group training sessions produced favorable results in the 5 components of fitness. Results: Pre-post data results indicated a large increase in muscular strength, a slight increase in muscular endurance and flexibility. Favorable changes in body composition also occurred with participants averaging a 1.06-1.07% decrease in body fat. All participants improved cardiorespiratory fitness as measured by improvement in VO2 max on the two field tests performed (ranging from 1.4 - 4.4ml/kg/min). Conclusion: A 10-week campus recreation program incorporating a balanced approach to training the 5 components of fitness produced favorable results in persons participating in the program.

Novelly, Kirsten
Faculty mentor: Christine Lemley

Morning, 10:30am-11:00am, Skydome Roundtable R3
Title: All Families are Beautiful: Celebrating Race, Ethnicity, and Sexual Identity
When schools do get involved in promoting gay-straight alliances and so forth, it is usually at the secondary level. Most people still get queasy talking about gay and lesbian issues at middle or - heaven forbid - elementary levels. Through a subtractive schooling method, I will ask the following question, How can we express that all family structures are beautiful? LGBTQ families are often critiqued as less than or different. This presentation intends to challenge this and show children how important family is, including any race, ethnicity, sexual identity, etc. Drawing from critical indigenous research methodologies, I will highlight how respecting different family structures is essential to promoting social justice through acceptance.

Nunez, Jared
Nicole Jablonsky, Daniel Rhinehart, Frida Ramos, Sarah Shoffner
Faculty mentor: Lisa Tichavsky

Session II, 2:00pm-4:00pm, 102C
Title: High Success
This study examines the relative effects of illegal drug or alcohol use and self-control (Grasmick, Tittle, & Ward, 1993) on academic success. We surveyed 100 college students at a mid-sized southwestern university in order to measure negative and positive correlations between academic success and illegal drug and alcohol use and self-control. We utilize OLS Regression to test the hypothesis that those with more alcohol and drug use will be associated with lower academic success. Additionally, we expect that low-self control will be associated with more drug use and lower academic success. The results and conclusions of the study are in progress but will be provided.

O'Brien, Elizabeth
Hannah Wiebke  
**Faculty mentor:** Melissa Birkett, Lucas Klein

**Session II, 2:00pm-4:00pm, 129B**

**Title:** *The Affects of White Noise on the Attention Span of Children*

We studied the affects of white noise on the attention span of children with ADHD

Odell, Olivia  
Abigail Perry, Tukee Begay, Gema Castillo, Lucy Greenbaum  
**Faculty mentor:** Leah Mundell, Brandon Pence, Karla Rodriguez, Phenious Chuma

**Session I, 9:00am-11:00am, 127A**

**Title:** *Global Migrant Connections*

Global Migrant Connections is a project produced by the Second Year Seminar class of Leah Mundell. The project consists of the stories and backgrounds of immigrants, migrants, and migrant workers in the Flagstaff community. These stories are presented through quotes, summaries, and photos that were collected throughout the project over this past semester. The interviews conducted include personal, first hand experiences of what these migrants have seen work in their favor as well as what challenges these individuals have been faced with. The themes in our project include: what it is like living without documents, the migrants' job experience, benefits or lack of benefits such as healthcare and childcare, the migrants' family situations, and a discussion of the rights migrants have and the rights that they are prohibited from sharing with the rest of the Flagstaff community.

O'Fallon, Paige  
**Faculty mentor:** Brandy Judson

**Session II, 2:00pm-4:00pm, 94A**

**Title:** *Behavior Change: Sleeping Habits*

This project is required by my SW 310: Human Biology for Social Workers class. My project will measure a specified behavior change that I identified at the beginning of the semester, which is to get more sleep every night. Feeling tired and distracted, I decided that trying to sleep for at least 8 hours a night was an important and healthy change in my life. I have kept track of how many hours a night I have slept for the last several weeks, and will use this information to explain my progress.

Okafor, Chiediebube  
**Faculty mentor:** Miguel Vasquez

**Session I, 9:00am-11:00am, 62B**

**Title:** *'It's just a preference'! The issue of colorism in our world.*

The topic of my project is the issue of colorism worldwide. The definition of colorism is: prejudiced attitudes and/or discriminatory acts against people based on the color of their skin. The difference between colorism and racism is that in cases of pure racism two people of different races but identical skin colors will be treated differently. But in the instances of colorism two people of the same race but different skin colors will be treated differently. As commonly seen throughout our world these two isms are constantly intermeshed and as a result we usually see the prevalence of colorism more than
just racism alone. My goal for creating this project and researching in depth on this issue is to create a greater understanding on the severity of internalized racism within our world.

Oliva, Dylan
Kristen Rieger, Ryan Torres, Bryce Igo, Abdulah Almerri
Faculty mentor: Sarah Oman, Chris Temme

Session II, 2:00pm-4:00pm, 3A
Title: Hozhoni Button Making Team
The Hozhoni Foundation is a local Non-Profit Agency in the Flagstaff area that specifically provide work opportunities for people with disabilities. With funding provided by W.L. Gore & Associates, the team was assigned to modify Hozhoni's button making machine. The machine is used to make pin-back buttons, and numerous local businesses have contracts with Hozhoni to produce thousands of buttons a year. Currently, only one client at the Hozhoni Foundation is able to use the button maker. The machine is too difficult for other Hozhoni clients to use due to the amount of physical dexterity and strength it takes to use the machine and successfully produce a button. Also, the machine only operates via a heavy leg press. The team has been tasked to design and create an assistive device to either modify the existing set-up or to create a brand new set-up that will allow other clients to make buttons. The issue has been broken down to three main areas of focus: cutting of the paper, alignment of the paper and pin-backs in the dies, and implementing hand actuation. Focusing on modifying these areas will make the machine more accessible and safe for clients with a wide range of disabilities. Ultimately, the team's design and modifications will give the Hozhoni Foundation more in-house jobs for their clients.

Oliva, Dylan
Kristen Rieger, Ryan Torres, Bryce Igo, Abdulah Almerri
Faculty mentor: Sarah Oman, Chris Temme

Morning, 10:45am-11:10am, duBois Fremont Room
Title: Hozhoni Button Making Team
The Hozhoni Foundation is a local Non-Profit Agency in the Flagstaff area that specifically provide work opportunities for people with disabilities. With funding provided by W.L. Gore & Associates, the team was assigned to modify Hozhoni's button making machine. The machine is used to make pin-back buttons, and numerous local businesses have contracts with Hozhoni to produce thousands of buttons a year. Currently, only one client at the Hozhoni Foundation is able to use the button maker. The machine is too difficult for other Hozhoni clients to use due to the amount of physical dexterity and strength it takes to use the machine and successfully produce a button. Also, the machine only operates via a heavy leg press. The team has been tasked to design and create an assistive device to either modify the existing set-up or to create a brand new set-up that will allow other clients to make buttons. The issue has been broken down to three main areas of focus: cutting of the paper, alignment of the paper and pin-backs in the dies, and implementing hand actuation. Focusing on modifying these areas will make the machine more accessible and safe for clients with a wide range of disabilities. Ultimately, the team's design and modifications will give the Hozhoni Foundation more in-house jobs for their clients.
Olivas, Sonora
Veronica Barragan, Erin Miller, Jorge Chiriboga, Gabriel Trueba, Dawn Birdsell, Crystal Hepp, Heidie Hornstra, Paul Keim, Talima Pearson, James Schupp, Melba Morales, Nancy Cantos, Mariana Loor, Bertha Intriago, Manuel Gonzalez, Soraya Rey

Faculty mentor: Talima Pearson

Session II, 2:00pm-4:00pm, 27D

Title: Positivity and Prevalence of Leptospira DNA in Human and Animal Samples from Rural Ecuador

Leptospirosis is a febrile illness that is highly prevalent in both tropical environments and rural communities. Animals often serve as a reservoir for the disease and human illness is caused by contact with infected animal urine or contact with contaminated water or soil. Many studies have been done on Leptospira in urban environments, but not much is known about Leptospira in rural areas. We collected 394 samples from rats, pigs, and cows and 1,221 samples from febrile patients over the course of 18 months in 2 rural towns in the province of Manabi, Ecuador. These samples were tested for infectious Leptospira species using a TaqMan assay that targets the 16S region. Our purpose was to examine which animals serve as reservoirs for Leptospira species in rural Ecuador and to evaluate the positivity of Leptospira in the samples taken. Results indicate that livestock animals are important reservoirs for Leptospira species in Manabi and, due to agricultural and animal husbandry practices, are likely to be sources of human infection.

Olsen, Karen
Lauren Quinto, Tomoko Wilson, Ella Santana-Propper, Ornella Selmin, Donato Romagnolo, Catherine Propper

Faculty mentor: Catherine Propper

Session I, 9:00am-11:00am, 27C

Title: Arsenic has no effect on estrogen sensitive genes in early embryonic Danio rerio.

Arsenic is a naturally occurring inorganic element that can leach into groundwater, leading to wildlife and human exposure through water resources. Such exposure is implicated in a variety of cancers, some of which are hormonally mediated, such as breast cancer. Evidence suggests that arsenic may interfere with the hormone estrogen's signaling processes. This study's purpose is to determine whether arsenic affects estrogenic activity using the developmental model Danio rerio. We conducted two experiments, testing the hypotheses that exposure to ethinyl estradiol (EE2) induces shifts in estrogen sensitive genes and arsenic exposure inhibits this expression. In the first experiment, 48 hpf zebrafish larvae were exposed to 0 ng/L, 100 ng/L, or 500 ng/L EE2. In the second experiment, 48 hpf zebrafish larvae were exposed to 0, 0.1, 1 or 10 μM As with or without 100 ng/L EE2. Exposures lasted 96 hours. PCR was performed on whole larvae to evaluate expression of estrogen sensitive genes: cyp19b, ers1, and vtg1. EE2 significantly increased relative amplicon abundance of these genes. Arsenic alone or in the presence of EE2 did not have an effect. Since no significant arsenic effect on gene amplicon abundance was found, we hypothesize that arsenic may affect these genes on the translational or post-translational level. We will analyze protein expression and evaluate the effects of arsenic exposure in breast cancer cell lines, to better understand arsenic's role in breast cancer development and progression.
O’Neel-Judy, Etude  
Faculty mentor: Timothy Titus

Session II, 2:00pm-4:00pm, 10C  
Title: Characterizing the Evolution of Mars South Polar Jets and Fans Using CRISM-THEMIS Observations  
The Martian global CO2 cycle is one of the primary drivers of weather on the red planet. In the Mars south polar winter, approximately 25% of the atmosphere freezes into a seasonal CO2 ice cap. In the spring, this ice cap begins to sublime, causing cold CO2 jets that spray dust and gas into the air. This dust settles on the surface of the seasonal ice cap as dark fans. Observations of fan lengths from the Compact Reconnaissance Imaging Spectrometer (CRISM) and Thermal Emissions Imaging System (THEMIS) were analyzed. These fan lengths have been processed and compared to wind speed output from the Ames Mars Global Circulation Model (MGCM). We observe a positive correlation between wind speed outputs from MGCM and our measurements.

O'Reilly, Michael  
Faculty mentor: Robin Tuchschererer

Morning, 8:55am-9:20am, duBois Marshall Room  
Title: 2016 PCI Big Beam Capstone Project  
The PCI Bigbeam Competition is being used as a capstone project for Civil Engineering students. For this project the team has designed a seventeen foot pre-stressed concrete beam. The beam was loaded until failure in order to determine the cracking strength of the beam, the ultimate strength of the beam, and the ultimate deflection of the beam. Additionally, the results from the beam testing are compared to the teams predicted behavior to show if the team corrected predicted the beam behavior.

Orsulak, Samantha  
Faculty mentor: Karen Renner

Afternoon, 2:15pm-2:30pm, Liberal Arts (Bldg #18) Room 120  
Title: Transfusion Confusion: Empathy and the Uncanny in Dracula  
This paper seeks to answer why Dracula and other monsters like him are so timelessly scary. The paper takes a literary criticism and psychological approach, using evidence from the novel, Freud's Theory of the Uncanny, and the study of empathy to analyze why readers continually pick up a book that makes them keep the lights on and the doors locked. The paper takes a deeper look at the formula for the monster genre and how Dracula specifically utilizes the feeling of helplessness to intensify a reader's experience of horror.

Oster, Taylor  
Faculty mentor: Bridget Bero, Eric Zielske

Morning, 10:45am-11:10am, duBois Marshall Room
**Title: Red Cloud Mine Preliminary Assessment and Site Inspection**

The Red Cloud Mine, located in Western Arizona, currently consists of 20.66 acres of land including the mine and several hundred tons of mine tailings. These tailings contain contaminants and hazardous materials that have been washed down Black Rock Wash, which is located on land managed by the Bureau of Land Management (BLM), directly south of the mine. These tailings have dispersed around the area due to wind and water migration. This land is used by the public, and poses a threat to the safety and health of humans, the environment, and the surrounding flora and fauna, due to contaminants in the tailings such as lead. In order to characterize the extent of the risk associated with the contaminants at Red Cloud Mine, a Preliminary Assessment and Site Inspection (PA/SI) was performed. The evaluations completed for the PA/SI included: surface soil sampling, analyses by X-ray fluorescence and atomic absorption to determine the spatial distribution and quantify contaminants of concern, and human health and ecological risk assessments. Based on the sampling and analysis results, the team determined the levels and extent of contamination, and estimated risk based on several different use scenarios.

**Ostovarpour, Matthew**  
Daniel Garcia-Briseno, Douglas Peterson, Thomas O'Brien  
**Faculty mentor:** Trent Hare, James Palmer

**Session I, 9:00am-11:00am, 5D**

**Title: Gigapixel Image Rendering**

With continued advances in space exploration, the need to efficiently process the large quantity of data received from space continues to grow exponentially. One important piece of data is the massive images of other planets, usually several thousand to several million pixels in size. The current methods of viewing these images is by either building pyramids or by creating tiles which can often take anywhere from a few minutes to a few days. Building pyramids also consumes a massive amount of disk space. We plan to provide researchers with a method of quickly viewing these images and a tool in which to view the images. The method we will provide is a stochastic sampling algorithm and the tool will be a lightweight image viewer. Our image sampling method, combined with our image viewer, will provide researchers the ability to view these massive images in a manner of minutes instead of hours.

**Ostovarpour, Matthew**  
Daniel Garcia-Briseno, Douglas Peterson, Thomas O'Brien  
**Faculty mentor:** Trent Hare, James Palmer

**Afternoon, 2:40pm-3:05pm, duBois Meadows Room**

**Title: Gigapixel Image Rendering**

With continued advances in space exploration, the need to efficiently process the large quantity of data received from space continues to grow exponentially. One important piece of data is the massive images of other planets, usually several thousand to several million pixels in size. The current methods of viewing these images is by either building pyramids or by creating tiles which can often take anywhere from a few minutes to a few days. Building pyramids also consumes a massive amount of disk space. We plan to provide researchers with a method of quickly viewing these images and a tool in which to view the images. The method we will provide is a stochastic sampling algorithm and the
tool will be a lightweight image viewer. Our image sampling method, combined with our image viewer, will provide researchers the ability to view these massive images in a manner of minutes instead of hours.

Pabian, Inez
Wayne Nez, Kristi Mascarenas, Destiny Valenzuela, Victor Jimenez, Fernando Monroy
Faculty mentor: Fernando Monroy, Victor Jimenez

Session II, 2:00pm-4:00pm, 27B
Title: Effects of ethanol on alveolar macrophage (MΦ) polarization during Pseudomonas aeruginosa infection.
Alcohol (ethanol) consumption is linked to the suppression of a variety of innate immune responses. Critically important, macrophages (MΦ) exposed to ethanol show a reduction in phagocytic activity and a disruption of cytokine balance. Pseudomonas aeruginosa, an opportunistic pathogen is associated with a high-rate of hospital-born respiratory infections. In the lungs, alcohol induced permeability disrupts respiratory tract immune barriers. Our objective was to study Arginine metabolism by analyzing nitric oxide (NO), pro-inflammatory (Il-6), and anti-inflammatory cytokines (IL-10) during acute P. aeruginosa infection in the presence of 0.08% ethanol. Arginine metabolism was measured by quantifying the products of both Arginase-1 and inducible nitric oxide synthase (iNOS). Enzyme and cytokine gene expression was measured by RT-PCR. Interestingly, non-activated MΦ only expressed IL-6 when exposed to ethanol, as opposed to a combination of both IL-6 and NO. This suggests that NO is primarily restricted to pathogenic infections. LPS-activated MΦ not exposed to ethanol demonstrated a significant upregulation in iNOS by 12 hours compared to MΦ exposed to ethanol. Upregulation of IL-6 was visible at 12-hour in MΦ+LPS, with suppression in the ethanol group. Ethanol exposed MΦ infected with P. aeruginosa showed upregulation of IL-6 6-hr post-infection, and a complete suppression at 12hr. Our data suggest that acute alcohol exposure impairs the ability of MΦ to successfully clear P. aeruginosa from lung tissues.

Pacheco, Bianca
Mikayla VanArsdel
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 78C
Title: The Impact of Assertive Community Treatment on Patients with Schizophrenia: A Systematic Review and Meta-Analysis
The efficacy of Assertive Community Treatment (ACT) for patients with Schizophrenia has been examined in recent psychotherapy clinical trials. The purpose of the current project is to conduct a systematic literature review and quantitative-meta-analysis to evaluate the research evidence to quantify the effect of ACT on symptoms of Schizophrenia. A meta-analysis is a research strategy that examines the results of several previous studies and computes its effect size. Meta-analysis are important to the field of psychology because results can vary across different studies and meta-analysis allow for researchers to have greater confidence in the treatment and its effect. Method: Electronic databases including PsycINFO and PubMed will be searched consistent with best practice standards (Preferred Reporting Items for Systematic Reviews and Meta-Analysis protocols: PRISMA-P;
Shamseer et al., 2015) for randomized controlled trials (RCTs) and non-randomized controlled trials (non-RCTs) in which ACT was compared to a control condition. Results: Methodology and results of located clinical trials that meet inclusion criteria will be reviewed and summarized. For the meta-analysis, the effect size for each clinical trial will be calculated. Then, an overall effect size statistic will be calculated for all of the trials. These statistical analyses will be conducted using the statistical program, Comprehensive Meta-Analysis (CMA) software, Version 3. Conclusion: Key findings of the systematic review and meta-analysis will be summarized, strengths and limitations of the published clinical trials will be noted, and suggestions for future research will be offered.

Padilla, Siearra  
Karli Leal, Mckenzie Durtschi, Emma Hallet  
Faculty mentor: Rebecca Maniglia

Session I, 9:00am-11:00am, 103A
Title: To Pimp A Butterfly  
This presentation will focus on the political influence that rap music, specifically Kendrick Lamar's album To Pimp A Butterfly, can have on society. This will focus on the songs of the album, the messages and questions it poses to the listener. Kendrick Lamar uses this album to pose a question to its audience. Kendrick Lamar is challenging his audience to look at society and consider how the conditions that people that live in the food face can be improved. The people that grow up in low class neighborhoods experience a lot of discrimination and inequality. There is potential that the music can inspire those who experience this discrimination to stand up and to come together to start a revolution. This album emphasizes the experiences of those that live or lived in the hood and how those experiences shape their perception of society. There is a large demographic in society that live in the hood that have an unheard voice. This album is focused on inspiring them to gain a collective voice aimed at improving the quality of their life experiences and give them and their future youth more positive experiences. It asks the question of whether they believe they should conform to society or improve the way it is now.

Padilla, Siearra  
Faculty mentor: Stefanie Kunze

Session II, 2:00pm-4:00pm, 72A
Title: Fort Mojave Water Rights  
The Fort Mojave Tribe faces several current day issues that focus around the water rights of the Colorado River. With the current drought issues that the Western United States has been facing, the Mojave Tribe has been faced with options and opportunities. Because the Mojave Reservation lays in California, Arizona, and Nevada the tribe faces a lot of state policy obstacles when dealing with their water resources. There have been cases where the United States congress has proposed policy to accommodate water rights policy that would improve resources for the indigenous tribes of the United States, all of the proposed policy has been denied. Some of the opportunities for the Mojave Tribe are to lease water rights to states for money and that money can be used to improve infrastructure on the reservation. The Mojave Tribe has lived on the land of the Reservation for centuries and is one of the very few indigenous tribes that still live in the land of their ancestors so it is important to protect their
land and rights. Their tribe needs to be protected in both state and federal policy especially in regards to their rights to water in this time of drought.

**Palomares, Perla**  
Timothy Flannery, Jerron Anthony  
**Faculty mentor:** Rebecca Maniglia

**Session II, 2:00pm-4:00pm, Skydome SBS Table**

**Title: A Critical Analysis of the Album To Pimp a Butterfly**
This project aims to critically analyze the album To Pimp a Butterfly that was released by Kendrick Lamar in 2015. This project will consist of asking others what they thought about the album and what they think this album means to them. Following this further we will also critically analyze this album and connect it to the issues that minorities are facing in the United States.

**Parker, Braden**  
**Faculty mentor:** Will Cordeiro

**Morning, 10:00am-11:00am, Skydome Stage C**

**Title: Monopoly: Mad Max Edition**
This Powerpoint presentation will compare the cinematic representation of monopolies in Mad Max: Fury Road to those in today's capitalist society as well as those in the past; it will also emphasize potential water monopolies and their consequences for the future.

**Payne, Taylor**  
**Faculty mentor:** Douglas Sutton

**Session I, 9:00am-11:00am, 120A**

**Title: The Effect of Skin-to-Skin Contact on Breastfeeding Duration**
Improving the wellbeing of mothers and infants has become an international priority as their wellbeing determines the health of future generations. The Baby-Friendly Initiative, which aims to revolutionize breastfeeding practices through the use of skin-to-skin contact, has become an increasingly important topic of interest. Skin-to-skin contact increases the likelihood that a woman will choose to breastfeed, improves maternal and infant temperature, and works as an analgesia during painful procedures for both the infant and the mother. The nurse plays a vital role in implementing hospital interventions, including skin-to-skin contact, as they spend the most significant amount of time with the patient. This study aims to determine if skin-to-skin contact between the neonate and the mother immediately following delivery for the first hour of life results in a longer duration of breastfeeding throughout the first year of life. Evidence-based practice supports the implementation of skin-to-skin contact for improving breastfeeding desire and exclusive breastfeeding for the first few months of infancy.  
**Keywords:** skin-to-skin contact, breastfeed, initiative, implementation

**Pendleton, Mason**  
Yumeng Li, Yifan Shan, Cyrus Guccione, Andrew Bolshazy, Richard Crinigan  
**Faculty mentor:** Xiaobing Zhao
Session II, 2:00pm-4:00pm, 41A

Title: A bottled bill for Arizona

The United States has 10 states that have successfully adopted and are currently reaping the benefit of enforcing an improper waste disposal market, also known as a bottled bill. As a market instrument, these container deposit laws reduce the quantity of raw materials being depleted in the production of new products by allowing a minimum refundable deposit on the majority of beverage containers. Many economically successful nations have adopted container deposit legislations, including Switzerland, Germany, Denmark, and Canada. This type of bill not only promotes sustainable and responsible behavior, but also requires very little supervision by the government. Some advantages of a waste disposal market in Arizona would be a statewide promotion of recycling, reduction in waste residuals and pollution, and an increase in saving for raw materials such as natural gas, petroleum, silica, and a variety of petrochemicals used in the production of plastic. Some states maintain a variety of waste disposal markets including rubber, metal, and lead/acidic materials that can be extremely harmful for both human and environmental health if not properly disposed of. A decrease in energy used for the production of new products from virgin materials could potentially free up capital and labor that can be utilized in other sustainable ways. By following the examples of the 10 states and a number of countries around the world that have already established bottled bills for their citizens, Arizona will be able to promote accountability and effective conscientious behavior, and hopefully influence other states to live sustainability.

Perez, Edgar

Cassidy Hartman, Anthony Rochin, Jamie McNair

Faculty mentor: Rebecca Maniglia

Session I, 9:00am-11:00am, 102D

Title: The Hood as an Environment of Rap

Rap music by many seems to be celebrating drug use and violence, but in fact it represents the people who live in the hood. The Code of the Streets or the rules that govern behavior in the hood will be addressed and explained as it pertains to rap artists. Lyrics of some rap songs by artists like NWA and Kendrick Lamar will also be analyzed to see the links between the music and the hood. The hood as a whole inspires rap artists to speak of their experiences and their lives and it is evident in the lyrics of their music.

Perkins, Abby

Faculty mentor: Julie Moreau

Session I, 9:00am-11:00am, 88B

Title: Music as Embodied Cognitions of Affective States

Whether listening or performing, music is the embodiment of your unique affective condition. For the audience, music allows for the embodiment of various affects indirectly by communicating the affective condition of the performer, instead of experiencing them first-hand. Music allows us to embody cognition without necessarily experiencing it, thus has numerous therapeutic benefits. Since music can act as a buffer in this way, people are able to listen to music that expresses negative affects like sadness and rage while experiencing enjoyment. For performers, social conditions and oppressions
can be affectively embodied and communicated to the audience, thus simultaneously connecting with a
community and individuating themselves. The punk rock scene of Mexico City expresses their
oppression through the physical exertion of their screaming, allowing audience members to connect
with their rage over lack of viable employment and wages. Understanding the role of music in our own
affective conditions can be an important tool for emotional wellness.

Perkins, Abby

Faculty mentor: Julie Moreau

Session I, 9:00am-11:00am, 91D

Title: Music as Embodied Cognitions of Affective States
Whether listening or performing, music is the embodiment of your unique affective condition. For the
audience, music allows for the embodiment of various affects indirectly by communicating the
affective condition of the performer, instead of experiencing them first-hand. Music allows us to
embody cognition without necessarily experiencing it, thus has numerous therapeutic benefits. Since
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like sadness and rage while experiencing enjoyment. For performers, social conditions and oppressions
can be affectively embodied and communicated to the audience, thus simultaneously connecting with a
community and individuating themselves. The punk rock scene of Mexico City expresses their
oppression through the physical exertion of their screaming, allowing audience members to connect
with their rage over lack of viable employment and wages. Understanding the role of music in our own
affective conditions can be an important tool for emotional wellness.

Perry, Jonathan

Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 62B

Title: Significant monuments and architecture from China
For my poster I will be talking about 5 significant monuments all made in China. The 5 monuments I
plan to talk about will be, The Great Wall of China, The Forbidden City, The summer Palace, The
Terracotta Warriors and lastly, The Jade Buddha Temple. These monuments range from, early 200 BC
all the way till the late 1800s.

Peters, Michael

Anna Sloan, Patrick Lambert

Faculty mentor: Viktoria Tidikis, Gregory Busath

Session I, 9:00am-11:00am, 79A

Title: Did your parents set you up for academic success
The purpose of the project is to conceptually replicate a study done in 2003 on academic achievement
in college students with regard to parenting styles (Joshi, Ferris, Otto, Regan, 2003). The original
study attempted to find a relationship between parenting styles and academic achievement in college
students and used an ethnically diverse group. The original study tested for parenting styles using the
parenting style index, but it is an unpublished manuscript and could not be obtained. Instead we are
using the parental authority questionnaire (Buri 1991) which serves our purpose by identifying
students with authoritarian, permissive, and authoritative parents. The sample our replication study is using is limited to the 302W student population.

Petersen, Carson  
**Faculty mentor:** Stefanie Kunze

**Session II, 2:00pm-4:00pm, 89D**

**Title:** Alcoholism within Native and Indigenous Peoples  
My paper will be about the struggle between native populations and alcoholism and its effects. Statistics show that alcoholism as a predominate problem within the culture, so I will show historical facts, as well as different information from different aspects.

Peterson, Hannah  
Angeleeta Greyeyes, Tim Behrens, Mina Liebert, Jay Sutliffe, Aubrey Day, Jennifer Howard Smith, Jodi L. Mack  
**Faculty mentor:** Tim Behrens

**Session I, 9:00am-11:00am, 115C**

**Title:** Food Preparation Policies Result in Healthier Lunch Sides in Public Elementary School Cafeterias  
Purpose: To examine the impact of a district-wide food policy and preparation change in elementary schools. Methods: This longitudinal observation examined changes in school lunch preparation methods following policy changes at elementary schools in a high need school district. Specifically, this study examined changes in side items (fruits, vegetables, potatoes, breads, and desserts). In Phase 1 (January 2009-May 2010) baseline data were collected. During Phase 2, (August 2010- May 2011), breaded and processed foods were removed and chefs were trained on scratch cooking methods. Phase 3 (August 2011-December 2012) saw an increase in fresh/frozen fruits and vegetables. During Phase 4 (January 2013 to present) chef consulting and training took place. The frequency of side offerings were tracked across phases. Because of limited sample sizes, data from phases 2-4 (intervention phases) were combined for potatoes and desserts. Descriptive statistics were calculated. After adjusting for length of time for each phase, Pearson chi-square tests were conducted to examine changes in offerings of side items by phase. Results: Fresh fruit offerings increased and canned fruit decreased in Phases 1-4 (p=.001). A significant difference was observed for vegetables (p=.001), with raw and steamed vegetables increasing and canned vegetables decreasing from Phase 1-4. Fresh potatoes (low in sodium) increased and fried potatoes (high in sodium) decreased from Phase 1 to Phases 2-4 (p=.001). Breads were eliminated entirely in Phase 2 and dessert changes were not significant (p=.927). Conclusion: This approach to promoting healthier lunch sides is a promising paradigm for improving elementary cafeteria food.

Petrides, Ariana  
**Faculty mentor:** Brandy Judson

**Session I, 9:00am-11:00am, 94B**

**Title:** Weight Loss and Exercise
My behavior change project includes me going to the gym and working out at least 5-6 times a week and losing 20 pounds by the end of the semester so that I will be happy with how I look at my brother's wedding in May.

Phalan, Miriam
Emily Stevens, Amy Roy
Faculty mentor: Frederick Lampe

Session I, 9:00am-11:00am, 62C
Title: Reclaimed Water on the Arizona Snowbowl: Environmental Impacts
The poster presents a visual and textual analysis of the environmental effects, or lack thereof, when using reclaimed water to make artificial snow at Snowbowl. Snowbowl is a ski resort situated on the San Francisco Peaks in northern Arizona near Flagstaff, Arizona. Reclaimed water is treated wastewater that is used to make artificial snow at places like, Snowbowl, by the Arizona Department of Environmental Quality. The poster will demonstrate the results of engaging the community to learn about potential environmental effects as well as community opinion through an anthropological scope. Surveys of the general Flagstaff public and the Northern Arizona University students will yield data to understand community engagement in environmental topics, as well as overall knowledge of Snowbowl making artificial snow with reclaimed water. Observation of environmental and community activists will be used as a premise to spread awareness of the use of reclaimed water at Snowbowl and the San Francisco Peaks. We also intend to raise awareness regarding the environmental effects of the use of reclaimed water.

Phalon, Sam
Madison Reese, Kelsey Blodgett
Faculty mentor: Taylor Joyal, Angie Moline, Tina Greenawalt, Fraser Watson

Session II, 2:00pm-4:00pm, 19B
Title: Drafting and Implementing a Restoration Plan for the West Pasture at Montezuma Well
Decades of overgrazing in the region surrounding Montezuma Well National Monument has led to a decrease in native biodiversity and an increase of invasive vegetation species. Beginning in 2007, the Park Service has recognized the importance in restoring areas under their management to historic conditions, but have had inconsistent mechanisms and levels of commitment in order to accomplish their objectives. Of the pasture land attached to the national monument, approximately one-third of the project area has been restored to satisfactory conditions. The western portion still requires a great deal of attention and will be the focus of this management plan. Using the resources available through the Park Service, a team of environmental sciences capstone students at NAU has been asked to draft and possibly implement a restoration plan that would rehabilitate 1-3 acres in the western portion of the project area. The objective is to create a comprehensive management plan that addresses the challenges that have made restoration in this area unsuccessful in the past. Areas of focus include: water access and retention, invasive species removal, revegetation of native species, and public engagement. The capstone students intend to create a comprehensive management strategy that provides the Park Service with implementable, cost-effective solutions that address each of the focus areas over time. By outlining several strategies, and presenting possible solutions for each obstacle to successful restoration, the Park Service will have the freedom to implement or reject the capstone
students' ideas on a case-by-case basis while having the resources to implement each idea readily on hand. Additionally, the capstone students intend to lay the foundation for continued work with Montezuma Well through capstone classes or internship opportunities in the future. This will allow for periodic reassessment of working strategies and goals, while continually engaging students at NAU with the Park Service, exposing them to work at a federal agency.

Phillip, Ulali  
**Faculty mentor:** Stefanie Kunze  

**Session II, 2:00pm-4:00pm, 69B**  
**Title:** *Climate Change Impacts on Indigenous Communities*  
This project will put emphasis on the countless issues on Indigenous lands concerning Climate Change. The project will explore the many Indigenous tribes within the United States and in other countries. The poster will stress the different viewpoints on these issues, these perspectives include environmental science, social science, health science and applied indigenous studies. With these views being highlighted I hope to educate my audience by expanding the knowledge of Climate Change and its correlation with Indigenous communities.

Phillips, James  
**Faculty mentor:** Melissa Birkett, Lucas Klein  

**Session I, 9:00am-11:00am, 129C**  
**Title:** *Can Sound Make You Ill?*  
This project is based on research to see if sounds or noises can have a negative impact on the health of an individual and if so what are those impacts. This study will be looking at both physical and mental illness in relation to sound and noise.

Phillips, Thomas  
**Faculty mentor:** Britton Shepardson  

**Session I, 9:00am-11:00am, 66B**  
**Title:** *Archeology of Weapons and Warfare*  
The project is a history of the archeology of weapons and warfare. It's specifying on the Paleolithic Age to Bronze Age. It focuses on a certain part of the world.

Pikero, Kevin  
**Faculty mentor:** Stefanie Kunze  

**Session II, 2:00pm-4:00pm, 72B**  
**Title:** *Drugs, Alcohol and American Indians*  
This project will be about the different statistics of drug and alcohol abuse within Native American communities. I will be describing the extent of the problem, the drugs and alcohol's effect on the community, and a brief history of drug use withing American Indian communities.

Pomeroy, Vanessa
Maddison Powers, Caroline Schillinger, Monica Overturf, Christina Meehan-Vernon  
**Faculty mentor:** Glenn Phelps

**Session I, 9:00am-11:00am, 89A**

**Title:** The Constitution of the Democratic Republic of Pacifica  
Preamble: We the people of the Democratic Republic of Pacifica in order to promote social well-being, economic prosperity, and education for all people, shall establish equality of opportunity, equality before the law, and the protection of human rights. The Democratic Republic of Pacifica will, under the Constitution, commit to the preservation of domestic peace, liberty, security, and justice, and ensure the protection of the people from actions that would limit their rights and liberties.

Pool, Rachel  
**Faculty mentor:** Melissa Santana, Danielle Gervasio, Zsuzsanna Gulacsi

**Afternoon, 1:45pm-2:00pm, Liberal Arts (Bldg #18) Room 120**  
**Title:** An In Depth Analysis of 20th Century American Design and Architecture's Foreign Influences  
Twentieth century American interior design and architecture was a mixture of immigrant styles and foreign cultures. America's unique design aesthetic became a melting pot of influences from different countries due to colonization, immigration, the popularity of travel and various historical events. This thesis paper takes an in depth look into five important design movements that swept across the United States in the 20th century. The forceful opening of Japan's ports in 1854 influenced the Arts and Crafts and the subsequent Art Nouveau movements in America. The fascination with the newly discovered tombs in Egypt, European Cubist artwork and the pre-Columbian and Caribbean cultures all had an impact on the Art Deco style. World War II refugees escaping Nazi Germany transferred from the German Bauhaus school of design and architecture to the United States which greatly influenced modernism. Lastly, the De Stijl movement from the Netherlands, the International Style and Scandinavian design heavily impacted the mid-century modern style in America. This paper analyzes specific events that happened in the world in the 20th century that prompted America to adopt other countries' design styles and to put their own twist on it. This unique time period, spanning roughly from 1880-1960, was an extremely unique and interesting era for American design and architecture. Our nation took direct influence from other cultures which prompted America's own design style to be a mixture of foreign influence, a time in American design that lacked a sense of nationalism.

Porter, Riley  
**Faculty mentor:** Brandy Judson

**Session II, 2:00pm-4:00pm, 94B**  
**Title:** Improving Self-Confidence With a New Positive Outlook  
Being a division one student athlete requires a lot of time, dedication, resiliency and sacrifice. It is basically like having two full time jobs, so you have to be in top health not only physically, but mentally and emotionally. Learning how to balance all these components and how to deal with stress is the toughest part; which is why I wanted to make the behavior change of having a more positive outlook on life and building my confidence. For this behavior change I have developed a goal statement, identified seven specific steps that will help me reach my goal, and developed a scale to
help track my progress. At the end I will provide a measurement and analyses of my outcome using a graph to display the results. My goal is to make small mental changes that will improve my overall well-being. I think having a positive attitude will contribute to my self-confidence which will not only make me a better student athlete, but allow to me enjoy life more in general and be helpful for future roles that I plan on taking on like a social worker.

Poston, Megan  
Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 94C  
**Title: Reducing Marijuana Smoking**

My presentation will be about a behavior change that I have instilled in my own life. College students, especially those that attend NAU, are often exposed to marijuana and it can start to take away from school, health, and relationships. My goal is to reduce the amount of marijuana I smoke to save money and help myself get healthier. I will be doing this by making different choices when I would usually smoke. For example; going to the gym, going to see my sisters, starting deeper relationships with people who do not smoke, and setting an amount of money I can spend on marijuana. I will measure my success by using a calendar to keep track of when I buy, how much I spend, how long it lasts, etc. This will be a good representation to see if I am actually reducing my marijuana habit.

Powell, Frank  
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 41B  
**Title: Potential Economic Impact Of The South China Sea conflict**

The South China Sea, located to the east of Vietnam, is one of the most strategic, resource rich, imperative bodies' of water on earth. The importance of the region has caused territorial disputes between Philippines, Vietnam, Taiwan, Malaysia, and Brunei and China. Not only are the stakes high for those countries that have territorial claims in the South China Sea but also for all countries globally. The South China Sea is valuable for several different reasons. One reason is the strategic importance of the region 'The South China Sea is the second-most used sea lane in the world', over 5.3 Trillion dollars of trade passes through the region. The region is also extremely oil rich, the U.S Energy Information and Administration reports there is approximately 11 billion barrels of oil and 190 trillion cubic feet of natural gas in the South China Sea. The region is also a very valuable fishing ground; it yields 8% of the worlds fishing output worth 6.5 billion dollars. The outcome of the South China Sea has not been settled. For the purpose of this report it will be assumed that China will gain control of region within the 9-dashed line. This area encompasses almost all the South China Sea and the areas that are resource abundant and have strategic importance. It will also be assumed that China will gain control of this region without any military action or escalation. This report will analyze the global economic impact of China gaining control of the South China Sea with the previous assumptions. The report will evaluate 3 different issues. 1. The Effect on China impeding Global trade in the region. a. Trade routes being re-routed b.China Imposing a Tax or Tariff on trade 2. China obtaining full access to the oil supply in the region. a. Effect of world oil trade 3. China obtaining exclusive rights to fishing grounds a. Economic and societal importance of fishing in neighboring countries.
Powers, Maddison
Vanessa Pomeroy, Caroline Schillinger, Monica Overturf, Christina Meehan-Vernon
Faculty mentor: Glenn Phelps

Session II, 2:00pm-4:00pm, 89B
Title: The Constitution of the Democratic Republic of Pacifica
Preamble: We the people of the Democratic Republic of Pacifica in order to promote social well-being, economic prosperity, and education for all people, shall establish equality of opportunity, equality before the law, and the protection of human rights. The Democratic Republic of Pacifica will, under the Constitution, commit to the preservation of domestic peace, liberty, security, and justice, and ensure the protection of the people from actions that would limit their rights and liberties.

Prather, Garrett
Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 124A
Title: Is preventing the allocation of fossil fuels to generate electricity a viable means to help create more sustainable energy in a cleaner manner?
Is the United States capable of producing electricity without fossil fuels. If so, to what extent will it help create a more sustainable energy in a cleaner manner. If not, how far off is the United States, and should the country be trying to do so?

Pratt, Alice
Faculty mentor: Will Cordeiro

Afternoon, 1:15pm-2:00pm, Skydome Stage C
Title: An Exploration of Gender Crossing in Shakespeare’s Twelfth Night
In this video presentation, I will show a video I have made performing a monologue of Viola’s from Shakespeare’s Twelfth Night in different performance styles and costumes; the juxtaposition of these different performance modes will highlight and explore the idea of gender crossing and gender expression in the play and in real life.

Price, Kristen
Faculty mentor: Brandy Judson

Session II, 2:00pm-4:00pm, 94C
Title: Volunteerism
The purpose of this assignment is to identify a behavioral change I would like to make in my life. Thus being, volunteerism. The project will include a statement of a desired outcome, a goal statement, steps necessary to reach the goal, reflection on capacity, motivation, and opportunities available to engage in change, a mechanism, frequency count, Self-Anchored Rating Scale, check list, for measuring change. After 9 weeks of analyzing this is a journal, I will submit a completed project.

Pristo, Lauren
Faculty mentor: Jinhee Yi

Session II, 2:00pm-4:00pm, 34A

Title: Development of antibody reactive markers to rapidly diagnose patients infected with Burkholderia pseudomallei

Melioidosis is a lethal infectious disease caused by the bacterial pathogen Burkholderia pseudomallei. This soil-dwelling bacterium is endemic to Southeast Asia and Northern Australia. Individuals that acquire melioidosis face a 10-40% mortality rate. The disease is difficult to diagnose rapidly, especially at early stages of infection when treatment is most needed and currently there is no approved vaccine for it. Subsequently, there is a demand to develop rapid and dependable molecular assays based on blood antibodies that will facilitate rapid diagnosis and proper antibiotic treatment. To this end, we used clinical samples from 50 Australian melioidosis patients to characterize each person's antibody response to the specific proteins in a B. pseudomallei culture grown from that person. Using immunogenic assays, we determined that patient antibody profiles were highly variable, with anywhere from 6 to 154 proteins raising an antibody response in each patient. Of these proteins, 17 have been selected as potential diagnostic markers because they reacted in up to 98% of the patients. Melioidosis patient samples collected at varying times after hospital admittance will be screened with these 17 protein markers to determine how soon in the infection melioidosis patients can be diagnosed. In future studies we will verify the specificity of these diagnostic markers by comparing blood samples from confirmed cases of melioidosis against patients that were hospitalized for a different reason. Our eventual goal is to confirm a set of candidate bacterial proteins to be used as diagnostic markers and in a potential vaccine against B. pseudomallei.

Pruett, Monica

Faculty mentor: Jay Sutliffe

Session II, 2:00pm-4:00pm, 123B

Title: Affects of a Nutrient-Dense Plant Based Diet on the Quality of Life

Health interventions serve as an effective way to improve mental health, sleep patterns, and overall quality of life. Following a nutrient-dense plant based diet can potentially improve the health and wellness of people. A 12-week research study was conducted to determine the effectiveness of following the nutrient-dense plant based diet on improving the mental health, sleep patterns, and overall quality of life of the participants. The 90 - 100 people that participated consisted of Northern Arizona University employees and Northern Arizona Healthcare employees and their ages ranged from 18 to 80. At the beginning and the end of the study the participants completed several questionnaires including: Pittsburgh Sleep Quality Index, Quality of Life Index, and Patient Health Questionnaire 9. The participants were committed to making this lifestyle change and show that it is possible to improve the health and wellness of people by eating whole foods.

Pynes, Jordan

Andrew DePaoli, Addison Guevara, Eleanor Krueger

Faculty mentor: Angie Moline, Jeff Meilander

Session I, 9:00am-11:00am, 19A

Title: Flagstaff EcoRanch: Funding Local Action for Sustainable Solutions
The goal of this project was to contribute to the long term success and financial sustainability of the Flagstaff EcoRanch, a community-based agricultural non-profit. In order to achieve this goal, we researched approximately 10 grants and created a list of deadlines, goals, and objectives for each. The deadlines are evenly dispersed over the course of a year in order to give the EcoRanch ample time to complete applications thoroughly. Additionally, our team wrote and submitted two grant applications. Effective methods to approach this project included communicating with the client and providing progress updates and status reports. We worked efficiently as a team and on an individual basis to research available grants and develop strategies to successfully complete the applications. The final product for this project was a timeline of available grants and two completed grants that were submitted to APS and the Flagstaff Arts Council. The timeline was presented to the EcoRanch to serve as a functioning outline for future funding opportunities. In addition to the deliverables, our learning objectives included familiarizing ourselves with the grant writing and application process, as well as gaining experience in consulting with a non-profit client. Upon completion of this project, the Flagstaff EcoRanch will be better equipped to take advantage of available grants and create more opportunities to address global challenges via local actions by nurturing community, democracy, and practical sustainability through empowering education.

Quinn, Michael  
**Faculty mentor:** Gerald Wood

**Afternoon, 3:20pm-3:40pm, Skydome Stage A**

**Title: Implementing Place-Based Education to Build a Stronger Community**
I am exploring the positive effects that place-based education has on the community. Place Based Education is essentially ditching the average curriculum and activating the students critical thinking skills by doing work based off their surroundings. Studies show that towns that have schools that implement PBE have a higher rate of young students volunteering in the community.

Quintana, Abel  
**Faculty mentor:** Brandy Jusdson

**Session I, 9:00am-11:00am, 94D**

**Title: Finding Consistency in the Inconsistent Lifestyle**
This project concerns that of behavior change within an individual, particularly myself. In this project, I am attempting to direct my behavior towards one of positive growth. Specifically, I am attempting to better my personal efforts and progress towards primarily school and my personal finances. In this, I am utilizing basic aspects of self management to sustain this goal through the use of efficient planning and recording, research of techniques to avoid procrastination and laziness, and utilizing technological assistance (Excel). Ideally, this project aims to show the ability of an individual to overcome their personal discrepancies that hinder them.

Raggio, Daniel  
**Faculty mentor:** Michael Bland, James Wittke

**Session I, 9:00am-11:00am, 14B**
**Title: Advancements in Scaling Models for Ejecta Blankets of Lunar Impact Craters**

Impact craters on the lunar surface have varying sizes, ranging from <100 meters in diameters to large impact basins hundreds of kilometers in diameter. Impact craters can be separated into two broad categories, simple craters and complex craters. McGetchin et al. (1973) derived a power law expression to model the thickness of the ejected material with distance from the crater for both types of craters, which was improved upon by Housen et al. (1983). Both models use Apollo mission data to determine the thickness of the crater ejecta blankets. The accuracy of the scaling models can now be assessed, as precise topographical measurements of the lunar surface from the Lunar Reconnaissance Orbiter's (LRO) Laser Altimeter (LOLA) now exist. In order to assess the accuracy of the McGetchin et al. and Housen et al. models, 100 lunar impact craters were selected with sizes ranging from 2.9 km to 96 km, with an average size of 15.2 km. All selected craters were 'fresh' (geologically young and undisturbed). Our analysis shows that the McGetchin et al. model underestimates the crater rim heights for both types of crater, and totally fails for complex craters. The Housen et al. model shows an acceptable fit for simple craters, while providing a range of adequate, underestimated, and overestimated fits for complex craters. For the purpose of this research, we focused only on the McGetchin et al. model to revise the values of constants in their power law model.

**Ramírez, Karely**  
Alisa Ramon, Shannon, Humphrey, Jamie Mahan, Claire Gannon  
**Faculty mentor:** Jamie Clem

**Session II, 2:00pm-4:00pm, 94D**

**Title: How Well Students Balance School While Working**

Our group conducted a research survey in attempt to figure out how well students balance their school work while maintaining a job. As a group we believe the more students work, the harder it is to academically succeed in their school work. Our research only allows Social Work students to participate in our survey. If they do not work, they may still continue the survey as work is not the only factor leading to failure of academic success. It is important to look at the lack of time a student spends on school work due to prioritizing their work schedule. While we look at how students manage their time, it is vital to see how much of that time goes towards personal care in order to get a more accurate information. After having multiple social work participants take our survey, we will be able to conclude whether or not it is harder to academically succeed while working.

**Ramos, Stephan**  
Bronson Pinto, Jonathan Grunwald, Catherine Propper, Robert Kellar  
**Faculty mentor:** Catherine Propper, Robert Kellar

**Session I, 9:00am-11:00am, 29A**

**Title: Integration of the Scratch Wound Healing Assay and Molecular Techniques to Elucidate the Effects of Arsenic and Estrogen on Wound Healing**

Hormones, and estrogens in particular affect wound healing. Shifts in hormones throughout life can induce changes in the ability for wounds to heal. Furthermore, environmental contaminants that influence hormone function may also affect the healing process. One environmental contaminant shown to affect hormone function is the ubiquitous metalloid toxin found in many water sources, arsenic. Since inorganic arsenic has been shown to act as an estrogen disruptor, we hypothesize that
environmentally relevant levels of arsenic will act to inhibit estrogen signaling processes and inhibit wound healing. Using a well-established in vitro wound healing assay, the scratch assay, we will first evaluate the effects of arsenic and estrogen on wound healing. Additionally, quantitative real-time polymerase chain reaction (qRT-PCR) will be used to evaluate molecular mechanisms involved in the effects of arsenic and estrogen on the wound healing process. Cultured human dermal fibroblast neonatal (hDFn) cells will be divided into six treatment groups, scratched, exposed to arsenic (0.0, 0.1, and 1.0 uM), and/or beta-estradiol (E2: 0 or 1 nM), and monitored for rate of wound closure every four hours for 24 hours. Cells will be collected, and stored in RNAlater for later qRT-PCR analysis for shifts in estrogen-sensitive gene amplicon levels. Outcome measures for the in vitro wound healing experiments will be percent wound closure and wound closure rate.

Rangel, Angel
Faculty mentor: Paul Donnelly

Session I, 9:00am-11:00am, 53A
Title: The Esoteric History of Christian Science
Christianity and science. Together, these belief systems create New Thought Christianity, or Christian Science. Inspired by the spiritualism of the 19th century, Christian Science still thrives today. Christian Science core beliefs include the manifestation of prosperity and healing oneself through the correct frame of mind.

Rasimas, Lauryn
Faculty mentor: Glenn Edgerton, Scot Raab, Deborah Craig

Session I, 9:00am-11:00am, 115D
Title: Chronic Traumatic Encephalopathy
Recently, Chronic Traumatic Encephalopathy (CTE), has garnered much media attention due to post mortem diagnoses of prolific athletes, but there is still limited research on the subject. CTE can be found primarily, but not exclusively, in the athletic population. Athletes involved in contact sports, or a sport where head injury occurs are at risk for CTE, but confirmed cases have been found specifically in boxers, football players, professional wrestlers, professional hockey players, and soccer players. The exposure to concussive blows as well as the repetitive sub-concussive hits experienced by athletes involved in these sports put them at risk for CTE. CTE is a distinct taupathy that is characterized physiologically by tau positive neurofibrillary tangles and neuropil threads containing neocortical tau immunopositive neurites, astrocytic tangles, neuronal loss, and atrophy of brain matter. CTE can only be diagnosed post-mortem via autopsy and has been linked to cognitive and behavioral abnormalities. More research is still needed on CTE in order to further identify potential risk factors, the specific mechanism that causes the proteinopathy, a way to diagnose pre-mortem, and a way to treat those affected.

Ray, Taylor
Faculty mentor: Melissa Santana, Galen Collins

Session II, 2:00pm-4:00pm, 51C
Title: Disney Boutique Hotel
A unique and sophisticated boutique hotel for true Disney enthusiasts, The Enchantment Inn will give guests a magical one of a kind experience. By sticking to the true Disney spirit of grand productions and exquisite detail, without becoming too themed, this hotel will thrill guests with its innovations while cultivating their longing for the nostalgic. With highly ornate suites for those that love the magic of Disney as much as any child. These suites will nod to their inspirational movies but in a mature and delicate fashion. The stories, own, original period will be taken into account for aesthetic selections. The Enchantment Inn will focus on creating an experience that submerges guests in the worlds of their favorite characters allowing them to have the full Disney experience without feeling as if they are in a room made for a child.

Reich, Maren
Faculty mentor: Francis Smiley

Session II, 2:00pm-4:00pm, 56A
Title: The Archaeological Record of the Aka Tribe of the Conga
For my symposium presentation, I will talk about the material culture and the archaeological record of the Aka tribe, a small scale tribe living in the Congan Forest. The Aka have limited artifacts that would survive into the archaeological record, making the tribes past difficult yet fascinating to explore. Archaeologists like myself will have to use natural clues left in the habitat, historical records, and the minimal findings that would survive into the record to fully reconstruct the life of these fascinating people. To do so, this project and presentation will show many aspects of the archeological process and reconstruction of these people. The presentation will allow readers to explore the incredible findings at the site, as well as showing how future archaeologists will find the surviving artifacts, unravel natural hints left in the area they once lived, and process the information found on site and in lab to fully reconstruct the lifestyle the Aka people to the best of their scientific abilities. This will be shown through pictures, graphics, and accessible text to allow anyone, no matter their archaeological knowledge, to understand, appreciate, and learn about this incredible process to uncover the life and legacy of the Aka people.

Rhodes, Brooke
Alexander Meisner, Tyler Shamburg, Abdullah Alsarraf
Faculty mentor: Eric Zielske, Tyson Parrott, Bridget Bero

Morning, 11:10am-11:35am, duBois Marshall Room
Title: Saginaw Hill Erosion Control
Saginaw Hill is an abandoned mine site located southwest of Tucson, Arizona managed by the Bureau of Land Management (BLM). An earthen cap was installed on the site in 2009 to contain soil contaminated by mining activities. Presently, the cap has deteriorated to unacceptable levels due to erosion. The goal of our project is to provide the BLM with design solutions that will enable long-term storage of contaminated soil at the mine site. Our team evaluated several properties of the cap that could have led to erosion, such as cap geometry, soil composition, and rainfall drainage. It was determined that the original cap eroded at such a high rate because it lacked drainage and topsoil layers. The lack of a drainage layer prevented infiltrated water from draining, and the lack of a topsoil layer prevented vegetation from growing. Our design solution includes restructuring the layers of the cap, adding drainage channels, and installing proper growth media.
Rhodes, Cole  
**Faculty mentor:** Britton Shepardson  
**Session II, 2:00pm-4:00pm, 62C**  
**Title:** Cole Rhodes The Prehistory of the Domestication of Animals  
In my project I will be briefly describing the Prehistory of the Domestication of Animals. I will be covering the basic who, what, when, where, and why questions. Not only will I be covering the basics, I will also be emphasizing more on the domestication of dogs due to them being my favorite animal.

Richards, Lauren  
**Faculty mentor:** Theresa Dowell  
**Session I, 9:00am-11:00am, 51D**  
**Title:** Designing for Healing: A holistic approach to healing Fibromyalgia and Chronic Fatigue Syndrome through patient guided treatments  
The most common complaint among Fibromyalgia and Chronic Fatigue Syndrome sufferers is that they feel they are not being listened to by their physicians and as a result are receiving general opiate based treatments that are not producing positive results regarding their health and well-being. I will be designing a healthcare facility to address this need for patient centered care. At Four Peaks Center for Excellence for Fibromyalgia and Chronic Fatigue Syndrome, physicians will strive to provide patients with the individual care they desire to achieve optimal outcomes through patient guided, non-opiate treatments. Patients will be welcomed into a safe and collaborative environment, where together with their physicians, patients will combine current, state of the art research, communication, and shared decision making to develop a long term strategy that will provide the best possible results for the patient's overall quality of life and health. The research component is what takes this healthcare facility beyond a clinic and into a center for excellence and Flagstaff will be the perfect location for Four Peaks Center for Excellence for Fibromyalgia and Chronic fatigue Syndrome to lay down its roots as there is not a facility like it in the state of Arizona. Through this holistic, patient centered approach to healing, patients may take back control over their quality of life by becoming active participants in the management of their health and well-being by choosing what they feel will be the most effective approach to overcoming their disease in a positive and safe environment.

Rickerd, Michael  
Skyler Buchanan, Cameron Fisher, Nolan Kirk, Bryce Ribucan, Kathryn Shallcross  
**Faculty mentor:** Jonathan Bruce, Timothy Becker, Sarah Oman  
**Session II, 2:00pm-4:00pm, 2B**  
**Title:** Calcified Vessel Model  
This project is focused on recreating the diseased state of the Superficial Femoral Artery (SFA) through the use of non-biological materials. As contaminants enter the blood stream and turbulent flow is induced, lesions begin to form on vessel walls. After a period of time the lesion will harden, restricting blood flow through the SFA. This leads to a variety of health issues. The final iteration of this design will be used to test devices that mitigate health issues in an environment that accurately mimics the human body. This will lead to a more thorough understanding of the intervention devices
and their ability to restore normal blood flow through the SFA. Several properties of the lesion will be tested, following the appropriate industry testing procedures, to ensure the final product meets all of the project requirements. The properties to be tested include: Lesion Hardness, Lesion Adhesion Strength, Lesion Length, Lesion Thickness, Degree of Occlusion, and Vessel Length. A sample base of 100-150 lesions was created, and a statistical analysis was conducted to ensure a 95% confidence level of the lesion properties. This will ensure that all artificial lesions created with this process will possess the same characteristics, leading to confidence in the test environment and the results of each test.

**Rickerd, Michael**  
Skyler Buchanan, Cameron Fisher, Nolan Kirk, Bryce Ribucan, Kathryn Shallcross  
**Faculty mentor:** Jonathan Bruce, Timothy Becker, Sarah Oman

**Morning, 9:20am-9:45am, duBois Fremont Room**  
**Title:** *WL Gore Calcified Vessel Model*  
This project is focused on recreating the diseased state of the Superficial Femoral Artery (SFA) through the use of non-biological materials. As contaminants enter the blood stream and turbulent flow is induced, lesions begin to form on vessel walls. After a period of time the lesion will harden, restricting blood flow through the SFA. This leads to a variety of health issues. The final iteration of this design will be used to test devices that mitigate health issues in an environment that accurately mimics the human body. This will lead to a more thorough understanding of the intervention devices and their ability to restore normal blood flow through the SFA. Several properties of the lesion will be tested, following the appropriate industry testing procedures, to ensure the final product meets all of the project requirements. The properties to be tested include: Lesion Hardness, Lesion Adhesion Strength, Lesion Length, Lesion Thickness, Degree of Occlusion, and Vessel Length. A sample base of 100-150 lesions was created, and a statistical analysis was conducted to ensure a 95% confidence level of the lesion properties. This will ensure that all artificial lesions created with this process will possess the same characteristics, leading to confidence in the test environment and the results of each test.

**Ricuito, James**  
**Faculty mentor:** Marie Baker-Ohler

**Session I, 9:00am-11:00am, 86D**  
**Title:** *The Meaning of Life*  
The meaning of life is something that all humans have an innate desire to discover. Over the course of one's life, individuals can experience existential conflicts or ontological assaults that bring their Being into question. Mental health factors such as anxiety and depression are two such ontological assaults. When one's Being is assaulted by anxiety, depression, or existential conflict, they may lose their purpose in life as they sink into hopelessness and despair. These matters are of an intrapersonal nature and can best be aided by interpersonal intervention, where the message of finding positive meaning in life can be spread. The goal of this of this project is to explore a form of interpersonal communication on the teachings of Viktor Frankl and his philosophical search for the meaning of life. With an emphasis on mental health issues, this project looks at Frankl's will to meaning and the ideas of
Nietzsche, Yalom, Sartre, Hyde, Heidegger, and Martin Buber in order to provide an interpersonal support system for someone in desperate need of acknowledgement and guidance.

Rivera, Jordan
Kelsey Snyder, Mykaela McFall, Kaitlyn Roy
Faculty mentor: Nora Dunbar

Session I, 9:00am-11:00am, 79B
Title: Perceptions of Disabilities
The project assessed perceptions in society towards individuals with disabilities. The research question was, Does the amount of special education inclusion in early school environments affect student's perceptions towards disability as adults? The hypothesis was, The amount of special education inclusion in early school environments has an affect on student's level of perceptions towards disabilities as adults. The sample consisted of Psychology 302 W students. The students took a survey via Survey Monkey. The results will show that students who were in an inclusive learning environment have positive perceptions of disabled individuals in society. The results will show that perceptions are formed at a young age and specifically, an educational environment impacts perceptions greatly.

Robbins, Manda
Faculty mentor: Kathleen Mahosky, Matthew Wangeman

Session II, 2:00pm-4:00pm, 78D
Title: Positive Behavior Support
The purpose of the project is to educate individuals on the behavior policies according to IDEA which refers to the Individuals with Disabilities Act and to investigate how effective the current policies are in promoting positive behavior in students. This project will discuss IDEA, positive behavior techniques, policies and behavior techniques used in schools currently, and changes that would encourage positive behaviors in all students. The importance of this project is that parents, educators, and NAU students will gain knowledge in what the educational laws state all schools must follow to ensure all students receive a free and appropriate education in the state of Arizona. This project will also explain what positive behavior techniques are and how effective these techniques are when used correctly. Lastly, the project will explain how we can improve our educational system by improving and utilizing positive behavior techniques to give all children the best education possible and to provide positive behavior support.

Robertson, Anna
Jill Griffin, Kellie Garrett
Faculty mentor: Suzanne Daiss, Kendra Krietsch

Session II, 2:00pm-4:00pm, 74C
Title: Self-Compassion as a Predictor of Student Health
The research conducted by Taylor, Daiss, and Krietsch (2015) has shown self-compassion is a strong predictor of mindful eating and low BMI. Our current research is a replication of this study, with an addition of eating disorder identification. Two hundred, n = 200, undergraduate students anonymously
completed surveys on the topics of self-compassion, mindful eating, and eating disorder identification. Participants' heights and weights were assessed by researchers to calculate BMI. A positive correlation between self-compassion and mindful eating and a negative correlation between self-compassion and BMI are anticipated. In addition, we predict a negative correlation between self-compassion and identification of eating disorders. The understanding of self-compassion as a predictor of undergraduate health may lead to effective health promotion programs on college campuses.

Roderus, Yvi
Faculty mentor: Marie Baker-Ohler

Session II, 2:00pm-4:00pm, 82B
Title: Hip Hop- a Powerful Communicative Force for Social Change
When people hear the word hip hop they often associate it with a music genre promoting violence, drugs and misogyny. One cannot blame them because mainstream radio and tv stations often paint that picture for them. Hip hop is widely misunderstood, which limits its reach to an older, often biased audience. Hip hop is much more than just a music genre. It is a positive, love and peace promoting culture that can be channeled in positive ways, particularly for social change. This project is a rhetorical criticism of the hip hop culture as a global communicative force with the potential to inspire social change. It looks at the way in which hip hop is sending messages through its elements, emceeing & djing, breakdancing and graffiti art. The purpose of looking at this is to illuminate the positive messages emerging from those elements, in order to combat common misconceptions. This project examines what types of messages are conveyed through from hip hop, in what way the elements of hip hop contribute to the effectiveness of those messages, and their potential to act as a catalyst for positive social change. The project looks at the history of hip hop which laid the foundation for the culture to emerge as a communicative force which promotes social change. Further, it examines each element individually and connects research done on each element's contribution to social change in the past and now.

Rodoni, Bridger
Matthew Gage, Tinna Traustadottir
Faculty mentor: Tinna Traustadottir

Session I, 9:00am-11:00am, 32B
Title: Cell Signaling in Response to Acute Exercise: Effects of Aging
Age and exercise have a very influential relationship on one another, especially in terms of oxidative stress. As individuals age, their body's natural ability to produce antioxidants and prevent oxidative damage reduces, leading to an increased risk of many chronic age-related illnesses. Two major proteins are involved in this biochemical pathway of antioxidant signaling: NRF-2 and BACH1. These two proteins coincide to regulate the balance of cellular antioxidants to reduce damage due to oxidative stress. By measuring the concentrations and locations of these proteins through immunofluorescent imaging, we can help answer how this biochemical response alters with age. We can also provide the ground work for future studies and strengthen our understanding of age-related cell signaling in humans. To date, we have established a working protocol for tagging these proteins in human PBMC cells and imaging is underway.
Rodriguez, April  
Uzma Tahir, Kiisa Nishikawa  
Faculty mentor: Kiisa Nishikawa, Uzma Tahir

Session II, 2:00pm-4:00pm, 28D
Title: Effects of activation on force-velocity properties of muscles during cyclical length changes
The sliding filament theory of muscle contraction has been in use for a while and remains largely unchanged despite failing to predict a number of important muscle properties. These properties enable muscles to change force output in response to changes in load, length and velocity instantaneously without input from the nervous system. The force velocity relationship describes how muscle force decreases with increasing shortening velocity and how muscle force increases with increasing stretch velocity. The force-velocity relationship is attributed to the attachment/detachment kinetics of the cross bridges, but is often only studied in fully activated muscles in after-loaded isotonic contractions.

The goal of the present study was to use work loop experiments to investigate how the force velocity relationship of muscles varies with levels of activation while focusing on optimum frequencies of stimulation. Soleus muscles from both wild type and mutant mice species were attached to a force lever that measured muscle force and length during imposed length changes. Muscles were stretched and shortened cyclically over a range of lengths from ±2% to ±10% of optimum muscle length (L0) and activation levels of 100% to 0% of maximum activation. Force velocity curves were constructed and the curves were scaled to maximum activation to compare their shapes at different activation levels. Preliminary data suggest that the work calculated from the integral of the force velocity curve has an optimum range of stimulation where max work is obtained. Work-loop experiments can be used to build muscle models that predict whole muscle force incorporating contribution of muscle elasticity and the contractile element.

Rodriguez, Jovani  
Charlene Slaughter  
Faculty mentor: Jay Sutliffe, Anthony Gobe

Session I, 9:00am-11:00am, 116A
Title: Nutrition for Education
The purpose of this intervention was to: implement a healthy change into the lives of the students at Summit High School; to educate the students in how to prepare healthy, tasty meals with limited resources; to educate students in simple cooking practices to encourage healthier meal preparation; to increase the students’ knowledge and consumption of fruits and vegetables, and create healthy meals on a budget; to increase their consumption of healthy alternatives (fruits, vegetables, nuts); to encourage students to limit their intake of high fat and high cholesterol foods; and to educate students on proper nutrition which will provide them with an opportunity to increase their development both physically and mentally. With proper nutrition the students have a better chance of avoiding health conditions that include heart disease and obesity.

Rody, Philip  
Faculty mentor: Eric Meeks

Session I, 9:00am-11:00am, 53C
Title: The Tohono O'odham and the Development of the U.S.-Mexico Border
The poster presents a visual and textual examination of the Tohono O'odham, an indigenous group of the borderlands region. Traditionally inhabiting a large area in what is today southwestern Arizona and northwestern Sonora, Mexico, the Tohono O'odham have historically been impacted by shifting land and border policies between the two nations. Under the Gadsden Purchase of 1853, a portion of land south of the Gila River and west of the Rio Grande was granted to the United States, creating a new border that intersects traditional Tohono O'odham lands. Despite this, the Tohono O'odham people generally moved freely across the international border for decades to work, see relatives, and participate in religious ceremonies. However, with the militarization of the border beginning in the mid-1980's, questions of citizenship rights have frequently emerged, creating significant obstacles for Tohono O'odham tribal members who were born in Mexico. The purpose of the presentation is to provide both a historical context for the Tohono O'odham tribe as well as an investigation of contemporary issues with particular emphasis on the development of the U.S.-Mexico border.

Rody, Philip  
Faculty mentor: Francis Smiley

Session II, 2:00pm-4:00pm, 62D
Title: The Bakhtiari of Modern-Day Iran: The Material and Archaeological Correlates of a Migratory Society
The poster presents a visual and textual examination of the material record of the ethnographically known Bakhtiari society of south-western Iran. Archaeologists can learn a great deal about the material correlates of migration by closely examining the ethnographic record of societies such as the Bakhtiari. The Bakhtiari, a migratory society who inhabit the plains surrounding the Zagros mountain range, serve as an ideal case study due to their large-scale annual migrations. Involving thousands of individuals and animals emigrating from the plains of Khuzestan—an area that is bountiful with grass in the winter but dry in the spring—and travelling for between 150 and 200 miles eastward to the plains of Esfahan, the Bakhtiari cross a seemingly impenetrable landscape year after year. The Bakhtiari and their livestock face many natural barriers and environmental hardships along the way, encountering fast-flowing rivers, steep terrain, and an extreme range of climates. The Bakhtiari have developed a wide range of products to aid them in the migration process, including sheepskin rafts, bridges, and cradles. However, the material composition of these items leads me to predict that the resulting archaeological record will be limited. The purpose of the presentation is to create a model of the kinds of material cultural items produced by a society given migratory needs, and to offer alternative methods of preserving Bakhtiari migratory culture with a limited archaeological record.

Rohlk, Alexandra  
Caitlyn Owan, Jessica Vicari, Carly Goodin  
Faculty mentor: Tricia Moore

Session I, 9:00am-11:00am, 109A
Title: Oral Health Curriculum for Primary Care Providers
AbstractPurpose: The purpose of this study was to assess the extent to which the Nurse Practitioner (NP) and Physician Assistant (PA) curriculum at a Southwest university prepared students in oral health. Methods: An anonymous online survey examining the attitude, knowledge, and behaviors
related to oral health (caries, oral cancer, and periodontal disease) was emailed to faculty and students in the summer and fall of 2015. Results: A total of 35 NP students, 15 PA students, 3 NP faculty, and 4 PA faculty responded. The results of the survey showed that the students from both programs knew more about oral cancer than tooth decay and periodontal disease. The students in both programs thought it was important to recognize oral disease but the case study results showed that they were not proficient in doing so. There was inconsistency between what the students reported learning and teachers reported teaching. Conclusion: Better-defined oral health curriculum for NP and PA students has the potential to improve interprofessional patient care.

Romero, Joaquin
Faculty mentor: Amber Nicole Pfannenstiel

Morning, 10:30am-11:30am, Skydome East Concourse - ADA section
Title: Hacking, Playing and Reddit
No abstract submitted

Rosier, Cassandra
Faculty mentor: Marie Baker-Ohler

Session I, 9:00am-11:00am, 85A
Title: Technology and Communication Concerning Individuals Living With Invisible Chronic Illnesses
The term invisible chronic illness refers to any disease that is not visibly apparent to others. By increasing our quality of communication with those who suffer chronic illnesses we can increase their quality of life. By understanding the struggles they experience we can better sympathize and provide them with support. Technology is becoming an ever growing field, and in regards to health, technology can also improve the quality of people who have an invisible chronic illness. In this current time technology is especially important in the lives of people who have an invisible illness because it provides them with information, an easier way to self-manage, support, empathy, and a sense of belonging. If people are more aware of what people who have a chronic illness go through on a daily basis and how their communication can hurt them, a change can occur in the communication that takes place, resulting in a better quality of life for those who have a chronic illness. By understanding what role health technology plays in the lives of those who have invisible chronic illnesses, and by improving communication we can provide those people with a better quality of life offline as well as online.

Ross, Anna
Maria Granroth
Faculty mentor: Will Cordeiro

Session I, 9:00am-11:00am, 106C
Title: Transgender and Intersex Athletes and their Impact on Professional Sports
A transgender person is someone who does not subscribe to the sex assigned to them at birth. An intersex person can have both male and female genitalia or genetic traits that give them both feminine and masculine features. Transgender and intersex communities have faced various issues over the
years. One prevalent issue that they face today is the discussion of transgender and intersex athletes in sports at multiple levels, from high school to the Olympic level. Transgender and intersex athletes have had extreme difficulty living as their preferred gender and competing in the sports they love at the same time. The court cases and controversies surrounding their gender and how they compete in sports has set these athletes on a difficult path. However, their stories and the issues they face have allowed for the creation of a dialogue about gender in sports, a dialogue which has begun to have impact on transgender and intersex athletes. Four athletes in particular have had a significant impact in the athletic world regarding gender, sex, and sports. Renee Richards, Fallon Fox, Michelle Dumaresq, and Caster Semenya are all transgender or intersex individuals who have begun to challenge the traditional, gendered model of competitive sports and competitions.

Rosson, Jordon
Colin Damlos-Mitchell, Israel Urbina-Muniz, Josie Martinez
Faculty mentor: John Houser

Session I, 9:00am-11:00am, 79C
Title: Stress and Coping Strategies in College Students
In an attempt to understand the coping habits of college students when under stress, a study was conducted that presented participants with several different scenarios of both high and low stress. Participants were given a packet of these scenarios and were told to choose which of the responses was most likely to be their behavior in the given scenario. The results of these responses were statistically analyzed with regard to how much stress was in the given scenario and what kind of coping strategy, based on the given response, was chosen. With this research, the researchers hope to learn how students react to perceived stress and possibly determine ways to help students choose more approach coping strategies.

Rudow, Allison
Faculty mentor: Christine Lemley

Session I, 9:00am-11:00am, 45D
Title: Overconsumption in Hawai'i
I will use Culturally Relevant Pedagogy to answer the following question, How is overconsumption affecting the land, air, water and people? This presentation will draw on Critical Indigenous Research Methodologies to show that we need to take responsibility for our actions and simultaneously respect the land, animals, and people who will be affected by the choices we make.

Ruiz, Anahy
Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 93A
Title: Healthier Me!
During this project I have decided to cut down on eating 'junk food' and I have been determined to eat way more fruits and vegetables and include red meat into my daily meals. I always crave a piece of chocolate and or a bag of chips, and I know these things have made me gain weight and in the end I hope I cut down on some weight as well as maintaining a pretty decent diet. I have created a weekly
chart to keep track of what I eat every single day. For every piece of junk food that I eat, I have decided to put $2 into a jar and use the money just for bills. If I manage to not eat any kind of junk I will reward myself with $5 and use the money towards a tattoo or anything I desire but hesitate to spend on.

**Russell, Sydney**
Isabella Mendoza

*Faculty mentor:* Melissa Birkett, Lucas Klein

**Session I, 9:00am-11:00am, 128A**

**Title:** The Affect of Music on Special Needs
This project will research how music and sounds can affect those with special needs. Music therapy a relatively new concept when working with children as well as adults, and music itself is a growing topic about how music and certain sounds affect the brain overall. Music is studied to understand if the affect on the brain is positive or negative. In previous studies music has shown a positive impact on studying or learning new material, and is groundbreaking in the area of using music to calm down people, especially those with disabilities and special needs, and using music to develop their fine and complex motor skills.

**Russell, Unalisa**

*Faculty mentor:* Stefanie Kunze

**Session II, 2:00pm-4:00pm, 102D**

**Title:** Criminal Justice Challenges for Native American Women
This research paper studies the challenges Native American women face. As a member of the Navajo tribe, this study may help determination of some of the issues that relate with violence and rape the Navajo Nation and other reservations. Discerning more about tribal law, explicitly the Major Crimes Act, it is certain that we are expected to be an self-regulating nation. However, the Federal Government is in the way of Native American independence with concerns like the Major Crimes Act and plenary power in the way. The matters for this paper will center on major crimes effects on the reservations. Identifying more about violence on the reservation will help with my profession of choice to work in Victim Witness Services on the Navajo Nation. Upsetting data associated with sexual assault and murder on the reservation are beyond belief, and the material in this research paper may help in organizing a Victim/Witness unit in numerous areas on the reservation. The objective for this paper is to help the public become educated about the realities surrounding the issues and facts relating to the realities of tribal law and jurisdiction women face on the reservation.

**Rynders, Michael**

*Faculty mentor:* David Trilling

**Session I, 9:00am-11:00am, 10B**

**Title:** 10m Main Belt Asteroid population estimation using cratering density from Vesta imagery
Asteroids in the Main Asteroid Belt that are below 1-3km in diameter are too small to be reliably detected through conventional means. Previously, the sub-kilometer asteroid population has been extrapolated using the population distribution of the visible asteroids. This assumes that the
distribution follows a regular pattern.4 Vesta is a minor planet in the first band of the Main Belt that was visited in 2012 by NASA's DAWN mission. During the Low-altitude Mapping Orbit (LAMO) portion of the mission images of the surface were taken down to a resolution of 22m per pixel. At this resolution craters with a diameter of ~50m were identifiable. There exists a 10-1 relationship between the crater's diameter and the impactor diameter. The 50m craters identified would provide information on the 5m asteroids that produced them. Representative portions of the surface were counted to provide a crater density. By knowing the crater density, the geometry of the orbits, and the age of the surface an estimate of the asteroid population was made. Based on the results it can be estimated that the first band of the asteroid belt contains approximately 200 billion asteroids in the 5-10m size category. These results provide more information regarding the formation and evolution of the Solar System and the Main Belt. It also impacts the estimates of surface ages of nearby objects, the number of Near Earth Objects (NEOs), and the dynamics of the Belt.

**Rytting, Emily**
**Faculty mentor:** Britton Shepardson

*Session II, 2:00pm-4:00pm, 66B*

*Title: Religion originating in Israel*
I am going to focus on the prehistory of spirituality/religion in Israel.

**Sackett, Taylor**
**Faculty mentor:** Glenn Edgerton

*Session I, 9:00am-11:00am, 116B*

*Title: Effects of Muscle Energy Technique on Low Back Pain*
A literature review was conducted looking in detail about the effects of the manual therapy, muscle energy technique, and it's effects on low back pain. The review splits muscle energy technique's proposed benefits into muscle flexibility, muscle strength and joint mobilization. Research on these three domains of muscle energy technique were compiled and reviewed, leading to the finding that more research needs to be done to validate this technique's proposed benefits prior to using the technique in a clinical setting.

**Sally, Joshua**
Brandon Clark, Stephanie Lowe
**Faculty mentor:** Brandon Clark, Stephanie Lowe, Neil Cobb, Lindsie McCabe

*Session I, 9:00am-11:00am, 28C*

*Title: Bees, Flowers, and Rising Global Temperatures*
Current climate change trends for the Southwest are predicted to significantly affect flowering plants. The difference in floral range distributions will strongly influence plant-pollinator interactions. Due to the strong relationship between bees and their floral resources, it is likely that specialist bees (i.e. species that only pollinate one genera of plants) will suffer the most. Few studies exist regarding plant pollinator relationships and their response to climate change (i.e. rising temperatures). We used ecological niche modeling to create range distributions for pollinators and their associated host plants. We found that species with less than ten host plants were more likely to have retained habitat in the
Based off of current climate change projections, there is significant evidence to predict that specialist bee species will be more affected than generalist bee species.

Salt, Shine  
**Faculty mentor:** Christopher Jocks

**Session I, 9:00am-11:00am, 69C**

**Title:** *Federal-Public Land: Collaborative Management to Protect Sacred Sites*

Native Americans have cultural resources and reserved treaty rights on federal lands that are threatened by resource development and recreational use permitted by a federal land agency like the Bureau of Land Management (BLM). The federal Indian Consultation Right 'contains those federal Tribal consultation statutes, orders, regulations, policies, manuals, and protocols that specify procedures as to how Departments, agencies and bureaus are to carry out consultation. It also includes many laws, orders, regulations and policies requiring that government-to-government relationships with tribes be carried out.' (ACHP, 2009) Unfortunately, many federal agencies are not complying to consult with tribes, leaving tribal sacred sites unprotected despite the federal government having duties to prevent harm to another sovereign's property. Tribal nations have the right to protect their cultural and religious properties, either it's on reservations or off-reservations. Using the Antiquities Act, can true Federal-Tribal collaborative management protect sacred sites? If so, what would it take to create co-management in efforts to preserve the landscape?

Salvatore, Heaven  
**Faculty mentor:** Melissa Birkett, Lucas Klein

**Session II, 2:00pm-4:00pm, 122A**

**Title:** *Music Taste: Maybe We're Born with It*

Everyone’s taste in music is unique to them, making it almost difficult to ascertain whether or not this is true. Age and experience both have a great effect on our music taste; they correlate with any changes in it as do many other factors. The question of nurture or nature is one argument that scientists have been debating for years in regards to many things. Are humans born liking the music they choose to listen to or is it something that is learned as they age? Or is this perhaps, a myth

Samaniego-Morris, Gregory  
Kelsey Morris, Kaeli Frechette, Madison Corey  
**Faculty mentor:** Angie Moline

**Session I, 9:00am-11:00am, 20D**

**Title:** *Produce Production and Community Development through The Flagstaff EcoRanch*

We supported the Flagstaff EcoRanch, a local non-profit organization, in developing partnerships in the Flagstaff community to distribute produce grown at the ranch. We worked to face global challenges via local action, democracy, practical sustainability and environmental education. By working in conjunction with the EcoRanch, we were able to foster public involvement though community networking. Our main goal was to set up at least one partnership between the Flagstaff community and the EcoRanch that could then be carried out in 2017. This project involved making a functional and realistic timeline for the vegetable production, outlining the distribution of produce to
our project partners, and making sure that the project would be economically viable for both the EcoRanch and the partner. Our work this semester also involved education, through the production of a community garden. At the end of our project we have a mutually beneficial partnership between the community and the EcoRanch that will be carried out in 2017 and beyond. We have produced a functional timeline that all parties involved will be able to rely on. Our group took advantage of the individual skills and passions each of us possesses to create this project that will be long-lasting and beneficial for everyone involved, as well as the greater Flagstaff community.

Sanchez, Dyanna
Christian Andrea, Kaitlyn Hasgood, Ashton Virs, James Huck
Faculty mentor: Lisa Tichavsky

Session I, 9:00am-11:00am, 101A
Title: Trustworthy or Treacherous: How We View The Police and Why
The goal of this study is to determine which factors of police interactions will cause individuals a lower perception of police. It is important to study and understand why individuals have certain feelings and ideas about police, how these are formed, and if knowledge is accurate so we can understand more about the social and personal behavior and acquired perception. We hypothesize that the more negative police interactions and exposure to negative media portrayals of police will more likely result in a lower perception of police. We surveyed 100 students at a mid-sized Southwestern university. We asked students about their history, ties, and acquired knowledge about police. We will utilize OLS regression to test the contingent effects of prior police interactions, personal ties to law enforcement, peer opinions, news sources, and social media influences on perceptions of police. The results and conclusions of the study are in progress but will be forthcoming.

Sanchez, Lucio
Kojun Kanda, Priscila Navarrete, Aaron Smith
Faculty mentor: Aaron Smith

Session I, 9:00am-11:00am, 33B
Title: A preliminary phylogeny for the pimeliine (Coleoptera: Tenebrionidae): A mega-diverse desert radiation
Pimeliinae is a morphologically diverse subfamily of tenebrionid beetles with over 8,000 described species found predominantly in desert regions across the world. The majority of species are flightless, with many tribes and generic groups showing high levels of endemism. In this study, we reconstruct a phylogeny for the subfamily using maximum likelihood methods based on nucleotide sequences from 3 loci drawn from mitochondrial (COI) and nuclear (28S, CAD) genomes. We sampled over 70 taxa representing 29 of the 39 currently recognized tribes of Pimeliinae. While deeper relationships within the subfamily were poorly resolved, the data suggests that Pimeliinae, as currently defined may not be monophyletic. This study represents the most taxonomically comprehensive molecular phylogenetic study of this subfamily to date. In conjunction with our results, a biogeographic study of Pimeliinae should be undertaken to further understand past cladogenesis and an assessment of taxonomically informative characters needs to be performed to produce a first tribal key to the subfamily.

Sanchez, Luke
Herbie Duah, Michael Ortega, John Loudon  
**Faculty mentor:** Steven Jacobs, Bjorn Krondorfer

**Session I, 9:00am-11:00am, 4C**

**Title: Holocaust Exhibit: Through the Eyes of Youth**
Through The Eyes of Youth: Life and Death in the Bedzin Ghetto is an exhibit created by NAU’s undergraduate students under the auspices of the Martin-Springer Institute (MSI). The exhibit details the lives of Jewish people in the Polish town of Bedzin during the Holocaust. A website was built in conjunction with the exhibit to act as an online platform for educators and historians. The website's first version was created collaboratively in 2015 under the direction of MSI by a multi-disciplinary design team from several departments: History, Religious Studies, Visual Communications, Education, and Computer Science. However, it was built quickly and in rather rudimentary ways with respect to capabilities and usability. The layout of this site has not been responsive to varying web browsers, screen dimensions, and devices. In the Fall 2015 and Spring of 2016, our Computer Science capstone team restructured the website, making it accessible to all platforms and improving its appearance and functionality.

Sanchez, Luke  
Herbie Duah, Michael Ortega, John Loudon  
**Faculty mentor:** Steven Jacobs, Bjorn Krondorfer

**Afternoon, 1:40pm-2:05pm, duBois Meadows Room**

**Title: Holocaust Exhibit: Through the Eyes of Youth**
Through The Eyes of Youth: Life and Death in the BÄ™dzin Ghetto is an exhibit created by NAU's undergraduate students under the auspices of the Martin-Springer Institute (MSI). The exhibit details the lives of Jewish people in the Polish town of BÄ™dzin during the Holocaust. A website was built in conjunction with the exhibit to act as an online platform for educators and historians. The website's first version was created collaboratively in 2015 under the direction of MSI by a multi-disciplinary design team from several departments: History, Religious Studies, Visual Communications, Education, and Computer Science. However, it was built quickly and in rather rudimentary ways with respect to capabilities and usability. The layout of this site has not been responsive to varying web browsers, screen dimensions, and devices. In the Fall 2015 and Spring of 2016, our Computer Science capstone team restructured the website, making it accessible to all platforms and improving its appearance and functionality.

Sanderson, Amy  
**Faculty mentor:** Anne Scott

**Afternoon, 2:00pm-3:00pm, Skydome Stage A**

**Title: Disability and the Media**
Mass media has the tendency to shape what the general public views as important, and also helps creates the image society holds of people that they are not directly familiar with. This trend quickly creates a problem. Mainstream media sources do not often incorporate disabled persons into their content, and when they do, the pictures they paint are frequently inaccurate and insulting. The problem expands beyond just this. As media portrayals shape the view society holds of disabled people, that
same societal view can have a profoundly negative effect on the disabled population as well. Disabled and able-bodied people alike often become what they are expected to be, and when almost an entire society thinks of people with disabilities as nothing more than a walking, sometimes talking, joke, that is what they can be encouraged to let themselves be. Nevertheless, hope for progress is not futile. This damaging cycle is beginning to grind to a halt. In more recent years, progress has been seen in terms of both increased and improved representation of people with many different types of disabilities. It is a change for the good, but in order to truly put an end to the harmful effects of improper media portrayal of people with disabilities, more needs to be done.

Santana, Elizabeth
  Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 62D
  Title: Mayan Writing System
  My poster describes the Mayan Writing system and how it is arguably one of the most visually striking writing systems of the world. It explains what they used in order to write and communicate. My poster will make it easier to understand the writing system and why it is so significant in a visual way.

Santiago, Reyna
  Ashley Alvarado
  Faculty mentor: Frederick Lampe

Session I, 9:00am-11:00am, 63A
  Title: Exploring World Culture through the Journey of People
  Exploring World Culture through the Journey of People. The anthropology course 301 People and Cultures of the World, is a course designed to teach undergraduate students the influence of cultural development, diversity, and to understand concepts of different cultures. Ways this course demonstrates this main concepts is by looking at different cultures around the world such as the Chambri tribe from Papua New Guinea, Native Alaskans, and the journey of a young man from Africa who migrated to the United States. Mini topics that are discussed within these three examples are as followed; Religion, Immigration, Race/Gender, Tribes, Tourists, Artifacts, Man and Women Rituals, Cultural tradition. Looking at these mini topics among the three cultures will give people a great understanding on how the world is full of diverse people.

Saraceno, Laura
  Faculty mentor: Brandy Judson

Session II, 2:00pm-4:00pm, 93A
  Title: Regaining Flexibility
  I am tracking the progress of a nine week behavior change. The change and goal that I am aiming for is to become as limber and flexible as possible. Two years ago I had a multi-level fusion on my L4/5, L5/S1 vertebrae. In order to keep the positive results from my surgery, I must get back to the flexibility point I was at before my surgery. I realize that reaching this goal is essential to my overall health especially as I age.
**Scarborough, Kelye**  
Angelina Castagno  
**Faculty mentor:** Angelina Castagno

**Session II, 2:00pm-4:00pm, 97B**  
**Title:** Debunking the myth of colorblindness among young children: Lessons from research on race in early childhood  
Despite widespread belief among White Americans, colorblindness is neither possible nor desirable if we hope to overcome racism in the United States. This paper highlights what we know about how children see and understand racial difference, and what educators and parents need to know about race and racism during the early childhood years. This review of the literature will highlight how stereotypes are formed when children are exposed to racial models exhibited by their parents, their community, and the media that are limited in scope and are biased towards the white norm. Additionally, the assertion that colorblindness exists and is valuable sends the message to children that racial differences are not important and therefore other defining characteristics may also be devalued. Children learn early on how to categorize people based on physical differences, including race, within the first few months of life. It is essential for educators to highlight racial differences in a positive manner rather than pretending racial differences are non-existent. This paper concludes by discussing at least two ways to engage young children in conversations about race: through selected children's literature and through ways children's literature provides instruction regarding issues of race and racism through critical thinking and discussion, encouraging an anti-bias, anti-racist forms of education.

**Schaffer, Trystin**  
Allison Spencer, Jennifer Mata  
**Faculty mentor:** Viktoria Tidikis, Gregory Busath

**Session I, 9:00am-11:00am, 79D**  
**Title:** Family Relationships and Mental Health  
This project is intended to explore the relationship between divorced families and non-divorced families and the likelihood of the children in the divorce to have depression and/or anxiety. The project also is exploring how age at the time of divorce (whether it is in childhood, adolescence, or adulthood) effects the individual. Parental history of depression and/or anxiety could be a variable when determining whether or not the child will succumb to depression and/or anxiety. We will be collecting our data through an online survey on Survey Monkey from Research Methods in Psychology (PSY 302W) students.

**Scheid, Julia**  
Alyssa Trinidad, Elise Miller  
**Faculty mentor:** Jay Sutcliffe, Tricia Fortin, Wendy Wetzel

**Session I, 9:00am-11:00am, 116C**  
**Title:** Community Chronic Disease Prevention  
Should nutrition be the primary focus for preventing chronic diseases such as diabetes and hypertension? In this study, the relationship between diet and health was examined, evaluating changes
in blood values. Blood values are an indicator of the risk of developing diseases such as diabetes and coronary heart disease. The study consisted of 95 participants who needed to meet the following criteria: Body mass index greater than 28, waist circumference of 35' for females and 40' for males and above the age of 18 years old. The span of the study was 12-weeks, with a 6 hour immersion for the first week. The participants were expected to adhere to a nutrient-dense whole-foods plant-based diet (NDWFPB). The guidelines for the NDWFPB were given to the participants during the immersion week. Weekly meetings were held to deliver nutrition education as well as motivational guest speakers. The pre and post blood values that were evaluated included: Fructosamine; Total Cholesterol; Triglycerides; HDL/Total Ratio; HDL; LDL; VLDL; Glucose; HS-CRP; HgA1C. A portion of the participants wore activity trackers for two weeks to assess the exclusion of exercise from influencing blood values.

Scheiner, Megan
Hannah Lillie
Faculty mentor: Viktoria Tidikis

Session I, 9:00am-11:00am, 80A
Title: An extended study of the misattribution of arousal in females
Research has supported the concept of adrenaline-producing, high-stress situations resulting in increased attraction toward the opposite sex (Aron & Dutton, 1974). There is evidence that physiological arousal has a direct impact on interpersonal attraction, and situations such as riding a roller coaster increases one's attraction toward the opposite sex (Klecker & Quigley, 2015). Thus, the goal of the present study is to establish a link, if any, between viewing stimulating images and resulting reports of attraction. It is expected that subjects will rate images of men as more attractive after viewing high-adrenaline images versus neutral ones.

Schenck III, Jeremiah
Faculty mentor: Cynthia Catizone, Peter Friederici, Laura Camden, Ryan O'Gorman, William Carter, James Reed, Kurt Martin

Session I, 9:00am-11:00am, 123C
Title: Pink Drawing Room Noise
This capstone presentation offers an autoethnographic study of broadcasts and newsrooms, depicted through anecdotal occurrences, almost like “scenes” themselves, in written format and, as such, allowing the reader to read beyond the situational scenes into the inner-workings of a newsroom and television broadcast. This presentation also presents a view inside the world of media and newsroom productions: experimental manipulations in the domains of the digital and audiovisual.

Schindele, Kristina
Victoria Grant, Lauren Leever
Faculty mentor: Will Cordeiro

Morning, 10:00am-11:00am, Skydome Stage C
Title: A History of Robots in Dystopian Literature and Film
Our Powerpoint/Prezi presentation will consist of a survey of robots in dystopian texts; we will analyze the socio-political implications and symbolism of robots as they influenced this sub-genre throughout the 20th and 21st centuries. We will also explain the cultural impact that films and literature about robots had over the decades.

**Schoech, Chelsea**  
Alfonso Zamudio  

**Faculty mentor:** Barbara Mendez, Yoleidy Rosario, Gerald Wood

**Afternoon, 3:00-3:25pm, Skydome Roundtable R3**

**Title:** Religious Persecution: A Social Demeanor  
To create awareness of religious persecution that has occurred and on some cases continues to occur so We (the presenters) plan to put this vision into action by incorporating art and pictures (which we will be creating) that will resemble events that have taken place in history and other forms of systematic mistreatment that have created or caused said faiths to feel hindered or persecuted in identifying or practicing their religion. In this workshop, we will use our supplies to help in creating a deeply focused visual aid with historical facts to mold and form an understanding of how religious affiliations have and continue to be repressed. This workshop will also incorporate a clear understanding of how said religions have been persecuted by many who have claimed to commit these acts in the name of their religion, yet are hypocritical to what the religion truly stands for, i.e. extremists.

**Schollmeyer, Jalyn**  
Laura Pauli, Sara Darley  

**Faculty mentor:** Laura Karnitschnig

**Session I, 9:00am-11:00am, 117B**

**Title:** Gestational Diabetes  
Gestational diabetes is any degree of glucose intolerance that presents during pregnancy. This phenomenon occurs due to the physiologic changes to a woman's body during pregnancy - specifically the change of insulin requirements. The woman who are at a higher risk of developing gestational diabetes include: overweight women, those who have a history of diabetes mellitus, those with excess sugar in their urine, and those with a strong family history of diabetes. This poster reviews the complications that untreated gestational diabetes poses on both the mother and the fetus. This poster also provides a review of literature and highlights nursing care implications. The studies reviewed include the following topics; deficiencies in vitamin D levels, common breastfeeding complications, and determining if any psychosocial predictors exist in the patient population.

**Scott, James**  

**Faculty mentor:** Julie Moreau

**Morning, 9:10am-9:30am, Skydome Stage A**

**Title:** The 'Scream' Affect: Looking at 'Final Girls' and Affect Theory  
Affect theory covers a range of different points of origin. One of the most interesting is through the mode of media consumption. Films are made to incur a certain type of emotion which is created through the manipulation of affect through the cinematic discourse in the film. In particular, horror
films employ a complex number of affects in order to scare audiences into feeling the way the directors and producers want them to. Chief among these affects is the one which originates from the 'Final Girl' trope. Utilizing various readings of affect theory, horror film theory and examples from the 1996 film Scream I plan to examine the points of affect within the 'Final Girl' trope and investigate their origin points within horror film.

Scott, Trevyn  
**Faculty mentor:** Dennis Foster

**Session II, 2:00pm-4:00pm, 41C**

*Title: A Breakdown of Public Choice Theory with Analysis of Health Care Regulation in the Affordable Care Act*

With 'market failure' as the modern justification for government control over private economic action, this study applied the perspective of public choice theory in its examination of increased regulation throughout the health care sector. Research was focused primarily on the analysis of key public choice principles, the application of these characteristics in health care, and the impact of centralization on market efficacy and expansion. Following the viewpoint of public choice, this study sought flaws in the diagnosis of real market failures as measured according to standards of an imaginary, perfect market. Contrary to a vision in which government succeeds wherever markets fail, research was conducted in search of evidence that government polity adopts inefficient and restrictive policies within the sphere of health care.

Scuderi, Jeremy

**Faculty mentor:** Neil Cobb, Lindsie McCabe

**Session I, 9:00am-11:00am, 28B**

*Title: Pollinator community transitions correlated canopy cover on elevation gradients*

Climate change is driving an upward shift of habitats. It is necessary for many regions to establish baseline data so that future change on different ecosystems can be recognized and measured. For those species largely associated with plant hosts, namely pollinators, the possible impacts of climate change are significant. Previous work in forested landscapes in northern Arizona documented a bee to fly pollinator transition along an elevation gradient. Our follow-up study focused on canopy cover as the driving factor in this transition. Two mountains located in Flagstaff, Kendrick and the San Francisco Peaks (SFP), were chosen as study sites because of the presence of a pristine forest on SFP and the absence thereof on Kendrick due to a fire in 2000. During the pre- and post-monsoon seasons, cup and cone traps were set up at three elevations: Ponderosa Pine Forest (~2400m), Mixed Conifer (~2600m) and Spruce Fir (~3000m). There was no significant transition on Kendrick while SFP had a significant transition. This research supports the importance of canopy cover to the insect pollinator transition along elevation. At the present, these findings are proven locally and future research is required to ascertain whether it is a local or global occurrence.

Seal, Jennifer

Justine Adams, Christian Banks

**Faculty mentor:** Christine Lemley
Addressing School Shootings in the Classroom integrating Culturally Responsive Teaching to Create a Culture of Caring

It brought the nation to its knees, but now that we've gotten back up, how have things changed; what have we learned? (from Columbine Memorial in Littleton, CO). Drawing on culturally responsive teaching, we will try to answer the question, How do we, as teachers, address school shootings in the classroom and create a culture of caring while eliminating the culture of fear that stems from the tragic incidents? to help students and teachers understand the harsh cultural realities. We will be drawing on relationally, respect, responsibility and reciprocity, to understand the culture of fear in our classrooms and in our society.

Seavey, Courtney
M. Keener, A. Shannon, J. Yi, R. Bowen, M.F. Simpanya, C. Allender, H. Hornstra, E. Settles, P. Keim
Faculty mentor: Paul Keim, Erik Settles

Goat antibody response to Burkholderia pseudomallei percutaneous infection: evaluation of serodiagnostic assays.

Melioidosis is a disease that effects humans and is endemic to Southeast Asia and Northern Australia. In efforts to develop an accurate and efficient diagnostic tool for the pathogenic bacteria, Burkholderia pseudomallei, that causes melioidosis, we have aimed our research at identifying immunogenic antigens from this pathogen. In the experimental design, five goats were percutaneously infected with B. pseudomallei, which is a natural route of infection with B. pseudomallei. Serial blood draws were obtained prior to experimental infection and at 4, 7, 14, 21, 28, 35, and 42 days post infection. The goat model samples were then tested for IgG and IgM antibody responses to specific protein antigens using indirect Enzyme Linked Immunosorbent Assays (ELISA). A total of 7 B. pseudomallei protein antigens were tested, along with a whole cell lysate (WCL) antigen and 2 carbohydrate antigens. The protein GroEL, one of the 7 experimental protein antigens, proved to have the highest antibody binding for both IgG and IgM antibodies. Distinct patterns were observed with an initial peak of IgM response and a secondary peak of IgG response over time. Importantly, the earliest IgG antibody response was 14 days using GroEL and WCL as the diagnostic target. In combination, these data suggest that the earliest antibody signal can be detected between 4 and 14 days after a B. pseudomallei percutaneous infection. This information and additional diagnostic antigens evaluated will contribute to the larger understanding of diagnostic candidates for melioidosis.

Seelig, Victoria
Justice Walker, Matt Stream
Faculty mentor: Ashley DeBoard

Sustainable Citizen Program

The NAU Sustainable Citizen Program is trying to get students from all different backgrounds around campus, and all different majors, to get involved with sustainability for their time at NAU. We intend to assist the creator of the program with implementation of this program by developing focus groups,
creating and delivering a survey to learn more about what the students want, and create effective marketing strategies. The goal is to get a cohort signed up to begin doing the program test pilot in the fall semester. This project is about the outreach to others, but we intend to learn from this program ourselves. We hope to learn more about 'The Sustainable Citizen program' and how to motivate students outside of environmental sciences to get involved with sustainability issues and stay involved with future careers. We will learn about Marketing and testing of components within the program. We aim to focus on creating a community feel within the program. This program will be benefiting the students by increasing the awareness of sustainability and enhancing the educational experience students attain during their four years.

Self, Amie
   Jifu Bao, Zixu Chen, Jake Luft, Kolbi McDaniel, James McNown
   Faculty mentor: Xiaobing Zhao

Session II, 2:00pm-4:00pm, 41D
Title: An Economic Examination of the SO2 Emission Trading Program in the United States
Sulfur dioxide (SO2) emission trading began in the United States in 1990 when the Clean Air Act Amendments Title IV were signed into law to try to control environmental damage. This law was put into place because the SO2 emissions were exceeding the ambient air quality standards put into place under the Clean Air Act. SO2 is a colorless gas with quite a smell that comes from the burning of coal and oil. When this gas is released into the atmosphere, it seriously affects the air quality and is also a health hazard to those consuming the air. As described by Burtraw and Szambelan (RFF DP 09-40, 2009, p.5): 'The law distributes emissions allowances to each affected power plant unit on the basis of its heat input during a historical base period (1985-1987), multiplied by an emissions rate calculated such that aggregated emissions equal the target emissions cap.' Once a new plant is created, it has to buy the emissions allowances; industrial sources do not have to participate in this system but they can if it proves to be beneficial to the company. In this paper, we will discuss who and what is involved in this trading system, how it is conducted and what units of measurement are used, how trading activity is regulated, what the rules of trading are, and whether or not this trading program has been successful.

Self, Isaiah
   Erik Settles, Dawn Birdsell, David Wagner, Paul Keim
   Faculty mentor: Dawn Birdsell, Erik Settles

Session II, 2:00pm-4:00pm, 29B
Title: MAGPIX: a new technological tool for diagnostics and new vaccines development for infectious diseases
Microbial pathogens of diverse origin (bacteria, fungi, viruses) have the ability to compromise human health by causing infectious diseases of varying magnitudes. Developing diagnostic tools for disease confirmation and vaccines for disease prevention are important strategies for combatting infectious diseases. Many different traditional methods (i.e. ELISAs) are currently used to provide disease diagnoses and aid in vaccine development, but these methods are labor intensive and time-consuming. However, recent advancements in technology have allowed for the development of a new tool (MAGPIX) that holds promise to increased efficiency of diagnoses and in identifying biological
components important for vaccine development as compared to traditional methods. The MAGPIX technology allows for the screening of single samples for multiple microbial infections or targets simultaneously within the same reaction. This design allows the MAGPIX platform to serve as a powerful potential diagnostic tool for identifying diseases from a broad range of diverse microbes. The purpose of our project was to validate the diagnostic capabilities of the new MAGPIX platform. In this study, we developed validation tools, identified optimal protocol conditions tested on a specific bacterial microbe (using Burkhoderia pseudomallei as a test model), and demonstrated the enhanced performance capabilities of MAGPIX compared to traditional methods, such as the ELISA. Our study demonstrates that the MAGPIX technology is powerful and effective for rapid diagnostic confirmation and an informative tool for vaccine development.

Sellers, Alysha  
**Faculty mentor:** Frederick Lampe

**Session II, 2:00pm-4:00pm, 63A**

**Title:** Ethnomedicine at risk

In the Aboriginal culture, traditional medicine is at risk due to colonization. Displacement of peoples has caused a loss of tradition within the Aboriginal culture and has impacted the availability of traditional healers which has led to people proceeding to modern medical care in order to heal ailments that were previously treated by a traditional healer.

Selter, Jessika  
**Faculty mentor:** Becky Butcher

**Session I, 9:00am-11:00am, 127C**

**Title:** The Death of Technicolor

This project explores the shift in American films from bright and happy-go-lucky to darker, more serious films in a period between the 1950s to the 1970s. It uses cinematic history and examples to exemplify changes in film genres and subjects based around the idea that Technicolor played a major role in the change. I will explore how Technicolor impacted film, both as a medium and as an aesthetic, in order to find reasons why films leaned towards more realistic American values with their portrayals after its downfall (beginning in the late 50s).

Serna, Sierra  
**Faculty mentor:** Francis Smiley

**Session I, 9:00am-11:00am, 63B**

**Title:** The Mbuti Pygmies of the Ituri Forest: Material Culture and the Archaeological Record

The poster presents a visual and textual examination of the material correlates of the ethnographically known hunter-gatherer society of the Mbuti in Central Africa. By exploring and analyzing the material culture of living societies, archaeologists can further understand prehistoric societies. The Mbuti pygmies are a hunting and gathering society inhabiting the dense Ituri rainforest in the Democratic Republic of Congo. Deep within the forest, the Mbuti survive off what the forest provides- namely small game, various fungi, and sometimes honey. The horticultural villagers surrounding the Mbuti sometimes trade what they cultivate for resources from the Ituri forest. The Mbuti do not manufacture
products, nor does the group live in an environment suitable for preservation. Thus, I predict the consequent archaeological record will be bare. The purpose of the presentation is to set out a model of the kinds of material cultural items produced by a society given the social organizational and other cultural factors that govern the operation of that society. The poster also presents examples of archaeological research on similar societies to compare archaeological reality with the ethnographically derived model.

Shade, David
Faculty mentor: Miguel Vasquez

Session II, 2:00pm-4:00pm, 63B
Title: Homelessness in a Mountain Town: A Critical Review
In the United States homeless is a term often accompanied with negative connotations. Social stigmas surrounding homeless include a broad idea that those individuals are unclean, uncouth, or all have a mental illness of some kind. This stigma is the focus of this project. Researchers will be working with local social services available to temporarily displaced and other homeless persons. The goal is to discover local social perception of the target population and how the same population is serving those individuals. Moving forward the goal is to create a more accepting and benevolent social structure to better provide the needs for all humans living in the area.

Shak, Julian
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 63C
Title: The Archaeology of Weapons and Warfare During the Upper Paleolithic
The archaeology of weapons and warfare of Homo sapiens during the Upper Paleolithic period, about 21,000 to 17,000 years ago. (spears, atlatl, arrowheads)

Shannon, Austin
Jinhee Yi, Lauren Pristo, Karen Hernandez, Talima Pearson, Erin Price, Mark Mayo, Erik Settles, Paul Keim, Bart Currie
Faculty mentor: Jinhee Yi, Erik Settles

Session I, 9:00am-11:00am, 30D
Title: Evaluation of the antibody response to Burkholderia pseudomallei in a 13-Year Chronic Carriage Infection
Burkholderia pseudomallei is a soil bacteria that causes the disease melioidosis. B. pseudomallei can cause acute or persistent, chronic infection and is difficult to diagnose outside endemic areas. In this study, we evaluated protein expression in bacterial isolates associated with a chronic melioidosis patient and the chronic patient antibody response. First, we compared B. pseudomallei protein expression from patient and environmental isolated strains. The environmental strain used is thought to be related to the original infecting strain and this strain has more genes compared to the patient isolated strains. We found that the strain persisting in the patient had reduced protein expression compared to the environmental strain. The protein reduction correlated with gene deletions but several proteins were reduced without gene deletion. We determined that early patient samples contained
elevated antibody levels that reacted to the environmental bacteria. In contrast, a lower level of reactive antibodies was detected in the same serum sample when using the chronic patient isolated strains of B. pseudomallei. This observation was confirmed using other immunological procedures. In combination, these data suggest that B. pseudomallei reduced its protein expression to avoid host antibody defenses in this chronic carriage infection. Identifying the immunological proteins that are easily deleted from the genome may provide insight into which proteins are poor targets for vaccination and diagnostics since they are not required for persistence in the human host. Furthermore, identification of chronic-disease specific immunological proteins could help differentiate acute and chronic melioidosis cases.

Shannon, Austin
Faculty mentor: Randy Wilson

Session II, 2:00pm-4:00pm, 10A
Title: Scientific Journalism: Its Significance and My Personal Experience
Scientists spend a lot of time describing their research in very exact, mechanical terms so that other scientists may follow and correct where they have erred. The majority of people, however, are not involved in science or research, yet their opinions on these matters are important and must be accurately informed. While contentious topics such as climate change and vaccination are less so in the scientific community, it seems that something was lost on the person that believes one is a hoax and the other is dangerous. Scientific journalism bridges the gap between the world of science and that of the average citizen. While requiring not only knowledge of the science and its relevance, but also mandating the ability to explain difficult concepts in a captivating and accurate way, scientific journalism can be a challenging endeavor. Maybe not as challenging as the science itself, but nonetheless important and rewarding.

Shannon, Kristin
Faculty mentor: Frederick Lampe

Session I, 9:00am-11:00am, 63D
Title: Expanding the American Legion's Public Connection
Veterans have always been underrepresented within the public sphere, especially in communities like Flagstaff which do not hold a strong connection with the US military. However, this does not allow the community to forget or disregard the needs of veterans. The American Legion aims to create a friendly and helpful environment for veterans from every branch of the service. Flagstaff's own American Legion, Mark A. Moore Post #3, strives towards the same goals. Entirely staffed by volunteer vets, the post is not situated as well in the public eye as they would like. Through this project, I aim to identify why this is so, and to suggest paths that the Legion could take to rectify this while using an anthropological lens.

Shannon, Ramsay
Faculty mentor: Francis Smiley

Session II, 2:00pm-4:00pm, 63C
The poster presents a visual and textual examination of the material record of the ethnographically known Semai of Malaysia. Archaeologists can learn a great deal about prehistoric societies by closely examining the material records of living societies. The Semai are a rainforest agricultural, hunting and gathering society of the Malaysian Peninsula. The Semai inhabit small settlements in clearings of the forest where they hunt and plant crops. The Semai use organic materials for all of the material culture in the society. I predict that the attendant archaeological record will be limited for the Semai society. The purpose of the presentation is to set out a model of the kinds of material cultural items produced by a society given the social organizational and other cultural factors that govern the operation of that society. The poster also presents examples of archaeological research on similar societies to compare archaeological reality with the ethnographically derived model.

Shaw, Taylor  
**Faculty mentor:** Marie Baker-Ohler  
**Session II, 2:00pm-4:00pm, 82C**

**Title: Gender Stereotypes in Film**
My capstone project uses feminist theory to highlight the gender stereotypes, portrayals, and communication styles in action films. Several recent action films are analyzed to identify the differences in how male and female characters are depicted and how these portrayals continue to foster a patriarchal culture. In addition, my project will discuss gender socialization, the media structure that controls the messages in action films, and the impact gender stereotypes in action films have on audience perceptions and self-image.

Sheffler, Tristen  
**Faculty mentor:** Britton Shepardson  
**Session II, 2:00pm-4:00pm, 71C**

**Title: The Prehistory of Food and Nutrition**
In this project I will discuss the food and nutrition sources of several different archaeological sites we looked at over the semester including Lascaux, Abu Hureyra, Gobekli Tepe and several other sites. I will break down each culture by hunter gatherers, agriculture and farming, and a transition in between the two.

Shoosmith, Jenna  
**Faculty mentor:** Anne Scott  
**Morning, 10:00am-11:00am, Skydome Stage A**

**Title: The Power of the Pen: Women and Education in the Middle East**
The current sociopolitical climate in the Middle East prohibits countless young girls from attending school or receiving an education. As a result, a significant gender imbalance has developed in Arab school systems and workplaces. For the past few decades, corrupt leaders and radical terrorist groups have oppressed women of the Arab Muslim community, usually through violence and fear. However, a few bold female voices have recently erupted from various Arab nations, and their messages have
echoed across the globe. They are demanding change, and their methods are proving effective. Although there are many notable individuals who seek gender equality in the Middle East, Malala Yousafzai, Shabana Basij-Rasikh, and Marjane Satrapi have all made significant contributions to the fight for women's rights and education for girls by utilizing their powers in writing, speaking, and storytelling. Their accomplishments are especially admirable because they have evoked change through nonviolent efforts. Instead of tearing down Arab societies as their adversaries have done for decades, these women are utilizing their voices and passions to effectively empower individuals in their home nations and around the globe. I was drawn to this topic because I felt inspired by the work that Yousafzai, Basij-Rasikh, and Satrapi have done. I would like to share their struggles, stories, and triumphs with the NAU community.

Shroyer, Caleb
Matt Julien
Faculty mentor: Mark Molinaro

Afternoon, 2:00pm-4:00pm, Skydome FCB Tables

Title: Cooking Sous Vide with Beer
This is a culinary demonstration of the method of cooking Sous-vide. Sous-vide is a cooking technique using accurately controlled temperatures to cook food in sealed plastic bags in a water bath to infuse flavor and create higher levels of succulence in food. This demonstration will highlight the precise temperature control of cooking Sous-vide and showcase a recipe using an Imperial Stout brewed by The NAU Beer Club. The recipe we will be serving is Imperial Stout short ribs on a bed of gorgonzola grits topped with chives. We chose this recipe to highlight the effectiveness of cooking meat Sous-vide by infusing flavors of the NAU Beer Club's Imperial Stout into the short ribs. The Sous-vide machine will be set up at the station to give a visual of how it looks, and how it works. We are demonstrating Sous-vide because it is becoming more and more popular in the restaurant industry, and we aim to show and inform about this unique cooking method. The demonstration will engage the viewer through visual and taste elements as they will learn about the art of cooking Sous-vide and taste the result of cooking at precise temperatures.

Sidak-Loftis, Lindsay
Faculty mentor: David Wagner, Joseph Busch, Liam Mueller, Christian Giardina, Joseph K. Bailey, Jennifer Schweitzer, Nathan E. Stone

Session I, 9:00am-11:00am, 29D

Title: Comparison of Ohi'a tree genotypes on old versus new lava soils in Hawai'i
Soils represent one of the first selective environments that plants face. Conditions on newly formed substrates, such as volcanic lava, are especially harsh and can impose a strong selective force on plants. On the Hawaiian islands, one of the first native plants to colonize fresh lava is the Ohi'a tree (Metrosideros polymorpha). Ohi'a show a wide variety of growth forms (phenotypes), ranging from small shrubby plants on barren lava to tall trees that dominate mature forests on older soils. In this project we ask whether Ohi'a trees that colonize new lava are a genetically distinct group compared to nearby larger trees on older soil. Both phenotypes inhabit a lava flow formed by the Mauna Loa
volcano in 1854-1855. Fragments of untouched mature forest, called kāpūka, survived as islands in the middle of the fresh lava and provide an optimal study site to compare the different tree phenotypes growing in close proximity on old and new soils. We used DNA fingerprinting techniques to genotype 168 Ohi'a trees for this comparison. We expect to see one of two outcomes in this study: 1) each tree phenotype is a distinct genetic variety that has adapted to old versus new soils, or 2) all trees are genetically similar, which would indicate that any Ohi'a genotype is capable of developing into any phenotype, regardless of soil age. The results will help answer a basic and important question about whether specific plant genotypes associate with the early stages of soil development on Hawai'i.

Sidak-Loftis, Lindsay
Faculty mentor: David Wagner, Joseph Busch

Session II, 2:00pm-4:00pm, 29C
Title: Testing the pathogenicity of close phylogenetic relatives of Burkholderia pseudomallei in a laboratory mouse model
Burkholderia pseudomallei is a gram-negative bacterium that causes melioidosis, a severe disease prevalent in Southeast Asia and Northern Australia. Close phylogenetic relatives of B. pseudomallei, or 'near neighbors', also occur in these regions but data on their pathogenicity is limited. Near neighbors are important because they are often cultured during field surveys for B. pseudomallei in endemic and non-endemic regions. In this study we tested the ability of seven near neighbor species to cause illness or mortality in laboratory mice (BALB/c). Past studies of B. thailandensis, the closest relative of B. pseudomallei, have suggested that this near neighbor is not highly pathogenic. Therefore, we hypothesized that other recently isolated near neighbors would not be highly pathogenic but might have the ability to cause illness in mice. We tested seven near neighbor species by challenging mice with a range of infectious doses (104, 105, or 106 bacterial cells per mouse). Only two species (B. thailandensis and B. vietnamiensis) caused noticeable illness. The most severe illness was caused by two environmental isolates of B. vietnamiensis, one from Florida and one from Australia, both of which led to visible sickness, a strong antibody response, and even death in one mouse. These findings suggest that B. vietnamiensis may be a highly immunogenic species, even though it is not considered a dangerous pathogen. The results of this experiment provide new information on the pathogenic potential of near neighbor species and can be used as a BSL2 infection model for comparison to B. pseudomallei.

Silva, Kristy
Faculty mentor: Gretchen Gee

Session II, 2:00pm-4:00pm, 90D
Title: Girls' Education, Youth Bulges, and Authoritarianism
Though child mortality rates have been decreasing in many developing countries, fertility rates remain high, resulting in what is known as a youth bulge: a phenomenon where a country has a disproportionality high youth population as a result of this disparity between child mortality and women's fertility rates. Developing countries often lack the resources and employment opportunities for these youth, resulting in an increase in political violence and protests. Developing states with youth
bulges are also more likely to be under authoritarian rule, further leading to the repression of the youth population and their ability to air their grievances peacefully. Though measures need to be taken to address the immediate needs of underserved and upset youth, preventive action and policies could prevent youth bulges from becoming a recurring issue. Increases in girls' education in the developing world has been shown to not only decrease both child mortality and mothers' fertility rates, but to increase economic development. This study argues that by increasing access to girls' education in developing countries, lower fertility rates will gradually decrease the likelihood of youth bulges, which will lead to a future with more stable and less authoritarian governments.

Silva, Kristy

Faculty mentor: Anne Scott

Morning, 10:00am-11:00am, Skydome Stage A
Title: Education and Welfare in Finland
During my Fall 2015 semester abroad in Finland, I had the opportunity to learn about Finnish culture; take part in exciting activities such as reindeer sled rides, swimming in the Arctic Ocean, and ice fishing; and despite being a Political Science major, I was able to take education courses. Why Finland? Finland consistently receives top marks in global rankings such as education and child welfare, areas where the Unites States has not been as competitive. This presentation provides an overview of my experience abroad, then examines the similarities and differences between education and welfare in the United States and Finland, such as the success, structure, and cost.

Simmonds, Mackenzie

Faculty mentor: Jani Ingram, Martin Mihay, Jonathon Credo, Tommy Rock

Session I, 9:00am-11:00am, 23C
Title: Elemental characterization of unregulated wells on the Navajo and Hopi Reservations
Arsenic and uranium are naturally occurring elements in the geologic profile of the southwestern United States. Mining can produce waste with high arsenic and uranium concentrations which can leach into groundwater systems. Groundwater from the western United States often exceeds the EPA limits of 10 parts per billion (ppb) for arsenic and 30 ppb for uranium. Chronic exposure to arsenic and uranium is associated with many health impacts ranging from increased risk of cancers to kidney damage. A previous study in our lab quantified and mapped arsenic present in unregulated wells on the Navajo and Hopi reservations, many of which are above the EPA safe drinking water standards. This study is an ongoing extension of the previous study. This study focuses on determining a range of transition and trace elements that could be present in water that has already been identified as having high levels of arsenic or uranium. The ten elements investigated (Ca, Cr, Cu, Fe, Mn, Ni, Pb, S, Se, and Zn) will help identify compounds that may be involved in harmful biological pathways relating to arsenic and uranium exposure. Water samples are analyzed via inductively coupled plasma optical emission spectroscopy (ICP-OES). The use of ICP-OES also allows simultaneous analysis of several elements. Preliminary results show that calcium, copper, iron, lead, manganese, sulfur, and zinc are present in the water samples at varying levels. This project will aid the Navajo and Hopi communities in developing an action plan to combat further arsenic and uranium exposure.

Simmons, Lucas
Session I, 9:00am-11:00am, 25A

Title: The Influence of Exporter Proteins on Ionic Liquid Tolerance of E. coli

Room temperature ionic liquids (RTILs), are molten salts composed exclusively of an organic cation and either an organic or an inorganic anion. The cation/anion can be modified in order to produce favorable properties for a given application, which is known as tuning of the RTIL. As these molecules have both ionic and non-polar properties, RTILs have shown promise as unique solvents suitable for a number of diverse applications. One such application is the use of RTIL as solvents capable of extracting biofuels from microbes that produce them. Although RTIL extraction affords isolation of the target compounds from the microbe with minimal damage to the cells themselves, some loss in viability of the producing strain is invariably observed. In this work, we have introduced and overexpressed various exporter proteins in E. coli BL21 (DE3) and characterized the ability of the resultant strains to withstand exposure to a variety of RTILs. Identification of enzymes capable of acting as RTIL exporters enables their incorporation into a biofuel-producing strains and is expected to enable the cell to efficiently produce and extract biofuels at toxic levels of RTIL. In a second application of this technology, exposure of the exporter expressing (RTIL-tolerant) microbes to a separate category of RTIL designed to have antibacterial properties was conducted. These tests enable us to determine the influence of the exporters on the observed antimicrobial characteristics of RTIL-based antibiotics.

Sipos, Claire
Jacob Miller, Andrea Smith, Kaitlyn Tighe
Faculty mentor: Ted Martinez

Session II, 2:00pm-4:00pm, 106A

Title: The Clone Wars: Corn Strikes Back

Genetically Modified Organisms (GMO’s) have become increasingly prevalent in modern food production. This is the manipulation of the genetic makeup of an organism. In agriculture, GMO’s are used in order to increase the productivity of the food industry. Though there are many economic benefits of doing this, the downfalls exist in the loss of nutrients and the lack of biodiversity in the foods consumed by Americans. Often resulting in many detrimental health issues in humans such as cancer, cardiovascular disease. On top of this, GMO’s are extremely detrimental to the environment due to soil depletion it causes. Our presentation demonstrates the impacts GMO’s have on the three pillars of sustainability: people, planet, and profit, in order to bring awareness to the reality of what is actually in the food we eat and how it is so negatively impacting the health of our nation and the health of the environment.

Sloan, Anna
Megan Poston, Abel Quintana, Alexander Demyan, Mackenzie Bayuk
Faculty mentor: Jamie Clem

Session I, 9:00am-11:00am, 93B
Title: The Effects of Marijuana on GPA
Our project examined if college students smoked Marijuana would it have an effect on their GPA.

Smith, Elena
    Erik Henricksen, Garrett Ribas, Meshal Alotaibi
Faculty mentor: Wilbert Odem

Afternoon, 1:40pm-2:06pm, duBois Room A
Title: Flagstaff Family Food Bank: Food Storage Facility Flooding
The Flagstaff Family Food Bank is located along E Huntington Drive, it is located between Historic Route 66 and I40. The Food Bank is experiencing significant flooding at the front entrance of the building. The purpose is to find a solution which will alleviate the flooding. Concrete barriers and sand bags are currently in place to prevent water from coming onto the property. The site experiences both low and high intensity flooding. During Low intensity flooding, the water only accumulates near the building and that the water trickles down the hill. In the case of the high intensity flooding, is as a result of two things: a neighboring catch basin and runoff from the road. In regards to the catch basin, it has been known to be undersized for the amount of water that drains into it. And it becomes clogged with leaves and debris. Runoff comes from properties to the north of the Food Bank site, then drains down and meets E. Huntington Rd, and drains onto the property. For the Family Food Bank flood control and remediation project, there are several technical considerations that will provide an efficient, cost effective, and safe solution. The team’s main focus will consist of; surveying and mapping, plan development, hydrologic and hydraulic modeling, and geotechnical analysis. All of these technical aspects will be necessary and shall be performed over the course of the project.

Snider, Katie
    Alyssandra Sandoval
Faculty mentor: Gerald Wood

Session II, 2:00pm-4:00pm, 44A
Title: Physical Education in Children
The purpose of this project is to ensure students are participating in active learning to achieve a good education. Active learning is defined as doing things that require physical movement, energy, and participation. How can we make sure children are and stay active? For starters, there are many organizations and clubs children can join. There are many benefits for children to stay active. Physical activity is essential for growth and development as well as the fact that it plays an important role in prevention of increased weight or obesity. Not only does staying active help strengthen bone density and body composition, but it also can be carried into adulthood. Overtime children's level of activity have decreased and usually, the only opportunity for them to be active is during school breaks. Most don't even get 60 minutes of physical activity a day.

Snyder, Garrett
    Dakota Smith, Paul Kinder, Paul Guzman
Faculty mentor: Rebecca Maniglia

Session II, 2:00pm-4:00pm, 101A
Title: To Pimp a Butterfly Album Analysis
Kendrick Lamar is an exceptional artist, and both Kendrick and his music are gravity defying. The conditions in which Kendrick was raised in and the struggles he faced daily has manufactured him into his own unique person. His experiences allow him to see the world in an extraordinary and noteworthy perspective. In the album, 'To Pimp a Butterfly,' Kendrick acknowledges his power and uses it to show people the world he and many others live in. He does this so that as a society we can understand the circumstances some communities have never felt. This album magnifies the issues in society including institutional racism, deceit in politics, brutalization by police, and the oppression from society. Although this album may be controversial in the eyes of many people, it touches on many real issues. We will be critically analyzing 'To Pimp a Butterfly' through the lyrics of each song, drawing out the current issues Kendrick sees in today's society.

Somoza, Brittanie
Coby Strub, Matthew Dallas
Faculty mentor: John Houser

Session I, 9:00am-11:00am, 71A
Title: The Influence of Word Length and Visually Salient Images on Free Recall
This project will aim to better understand how word length and picture similarity affect how well a person can remember a set of words. We are motivated to study this because we ourselves are students, and the results of this study could help us to understand better ways to remember information, and by proxy, students in general. The aim is to find to a better way for students, or anyone truly, to memorize words that they made need to know for a test, essay, homework, work, directions, and much more. This will be done through the use of four different slideshows. Each will contain a series of 14 words of lengths varying from 3 to 8 characters. Each word will also be paired with a picture that reinforces or antagonizes the paired word. From this we will see how much word length and picture similarity determine whether a word is or is not remembered.

Sotelo, Claire
Faculty mentor: Nancy Riggs

Session II, 2:00pm-4:00pm, 14A
Title: Understanding the Eruption History of SP Crater, Northern Arizona, through Tephra Mapping
SP Crater, located 50 km north of Flagstaff, AZ, erupted ~60 ka. Variable-depth holes dug around SP and stratigraphic columns, complemented by componentry studies, provide insight into changes throughout the eruption. Variation in clasts near the cone include color, density, and vesicularity, and indicate a change in eruptive style. A two-phase eruption, with earlier tephra more vesicular than denser later tephra, is supported by rafted cone remnants on the flow, and the present conical shape of the cone. Thirty-one holes from 20-240 cm in depth provide information on the dispersal area of the deposit. Tephra covers an area of ~100 km², with two lobes to the NE and E, overlapping NE of the cone, and extending NE ~12 km, placing the eruption between Strombolian and violent Strombolian. With tephra thickness near the cone 210 cm, dissipating to 20 cm, the total volume of tephra ejection may be greater than 0.1 km³, classifying the eruption between 3-4 on the VEI scale. Two distinct clast types were identified: frothy, vesicular, brittle, and brown type underlies black, less-brittle clasts. Near
the cone the stratigraphy of the deposit is well preserved while bioturbation has greatly affected thinner deposits. Variation in bedding and direction of deposition indicates a two-phase eruption, with distribution lying generally NE-E, indicating dominant SW winds. Field data support a hypothesis that a gaseous first episode occurred prior to flow eruption, with an additional less-gaseous eruption after the flow.

**Sotelo, Miguel**  
Penny Trunzo  
**Faculty mentor:** Melissa Birkett, Lucas Klein

**Session I, 9:00am-11:00am, 130A**  
**Title:** *A Study of Music Evolution as a living organism*  
This project will examine trends of music throughout different generations, through personal preference, and using mechanisms closely related to darwinian theory to examine how music changes and responds over time to selective pressures. The project will examine beat, rhythm, and numerical values to show the change of musical style through time. Ultimately showing how music changes and evolves just like a living organism.

**Spillman, Rielly**  
**Faculty mentor:** Dennis Foster

**Session II, 2:00pm-4:00pm, 42A**  
**Title:** *Social Security*  
My group will be presenting on how our current economy has caused a market failure because of economic myopia and public provision of private wants. Our resolution is that Social Security, as far as retirement, excluding VA benefits and disability benefits, should be completely privatized. Given our current state of affairs in regards to Social Security it would be better that Social Security become completely privatized so as to avoid market failure.

**Spillman, Rielly**  
**Faculty mentor:** Ryan Fitch

**Session II, 2:00pm-4:00pm, 42B**  
**Title:** *Education*  
Given our current state (meaning how education is in Arizona right now) would it be better for the education system (Higher Education) to move towards being more like a free market or a planned economy? I plan on taking into account both Efficiency and Moral debates to build my thesis and have acquired a number of scholarly articles of which I believe may pertain to my topic. I can take into account states of which are more like a free market, or a planned economy, in the instance of education, the amount of education that people have received in those states and measure the GDP and or other possible units of measure.

**Spitzley, Matthew**  
Antonietta Bartley, Ricardo Garmlzar, Matt O'Dwyer  
**Faculty mentor:** Rebecca Maniglia
**Session I, 9:00am-11:00am, 101B**

**Title: Rap and Drugs**
The purpose of our project is to look into the relationship between rap and drugs. Drugs play a major role in the rap industry in many ways. We plan on looking at the connection between selling drugs and rappers, as well as the use of drugs by rappers. We will also consider the drug use on the west coast compared to the east coast.

St. Clair, Charlie
Nicholas Anable, Jackson Pergiel, Haley Duncan
**Faculty mentor:** Will Cordeiro

**Afternoon, 3:00pm-4:00pm, Skydome Stage C**

**Title: Dystopian Stories: A Reading (2)**
This reading will feature creative writing written by students in HON 294: Dystopias. Several students will read their original dystopian short stories and scripts.

Stalley, Alisha
**Faculty mentor:** Francis Smiley

**Session II, 2:00pm-4:00pm, 75B**

**Title: The Material Correlates of the Yanomamö Tribe of the Amazon Rainforest**
This project was conducted to better gain knowledge of the Yanomamo Tribe, their life way patterns, and the materials that would remain in the archaeological record. In archaeology it is important to understand the correlation between living habits and patterns and how that is represented through materials that may or may not remain intact.

Stanford, Emani
**Faculty mentor:** Zsuzsanna Gulacsi

**Session II, 2:00pm-4:00pm, 52A**

**Title: Iconography of Seasons in Japanese Pictorial and Food Art**
This study highlights the prevalence of themes of seasonal iconography in two types of Japanese art. It argues that the well-known seasonal themes, which are popular today, have been prevalent and mostly unchanged since the 19th century, where one can see the same iconography in Edo-Period (1603-1868) painting and ukiyo-e prints.

Stanley, Madeline
Carla Marasigan
**Faculty mentor:** Jay Sutliffe, Anthony Gobe

**Session I, 9:00am-11:00am, 116D**

**Title: Enhanced Physical Education and Health Risk Management Program at Summit High School**
The focus of our program was to educate the students enrolled in the Physical Education and Health class at Summit High School in Flagstaff, Arizona in order to promote healthier behaviors to be applied to their lives outside of performing physical activity in a classroom setting.

Starrett, Nicolas  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 63D**  
**Title:** Ancient Monolithic Architecture

This project is a compare and contrast of large Monolithic sites, in search of answers to the age-old questions, how did the ancients achieve an architectural precision that for us today has only been possible in the last century, and, what was the purpose of these monumental sites? The project shall compare and contrast the locations, face of direction, size, build types, and purpose. Location will compare and contrast the common surrounding area, any correlation in geography, longitude, and latitude, and natural environment. Face of direction refers to monolithic structures aligning with star systems, signs of the solstices, the moon, or the sun. Size will look at the sheer size of these structures, the precision required to construct a site of such magnitude, and the mathematics required for its creation. Build types will illustrate the similarities and opposing building techniques and architecture between these iconic sights. Purpose will look at the common cause and cultural importance that justified building such grand structures that required an even more grand population to construct them. Understanding the parameters of these sites give us a greater understanding of our species, the ancient technology required to construct them, and, where our own societies' technological discoveries are in comparison.

Steffan, Ricki  
Taylor Weiss  
**Faculty mentor:** Sumner Sydeman

**Session II, 2:00pm-4:00pm, 79A**  
**Title:** Cognitive Therapy for Adult Bipolar Disorder: A Systematic Review and Meta-Analysis

**Objective:** The effect of cognitive therapy for adult bipolar disorder has been determined in many different clinical trials. The main purpose of this current project is to conduct a systematic literature review and quantitative meta-analysis that will assess the data found in past research in order to determine the effects of cognitive therapy on symptoms of adult bipolar disorder. Systematic literature reviews and meta-analyses are important because they help evaluate the findings of all past research. They allow one to find gaps and inconsistencies in literature and help determine the reasons for these issues. A meta-analysis is a statistical analysis that tests the significance between multiple individual studies. **Method:** Two electronic databases, PsychINFO and PubMed will be searched consistently with specific standards for randomized controlled trials and non-randomized controlled trials for which cognitive therapy was either compared to a control condition or tested on its own for adult bipolar disorder. Results: The methods and results of the found clinical trials that meet the specific criteria will be reviewed and summarized. Calculations of the effect size for each clinical trial will be conducted during the meta-analysis. The statistical program, Comprehensive Meta-Analysis software (Version 3), will be used to conduct these statistical analyses. **Conclusion:** The main findings of the systematic
review and meta-analysis will be summarized, strengths and limitations of each trial will be described, and suggestions for research conducted in the future will be proposed.

**Stephens, DaCelia**  
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 64A**  
**Title:** Neolithic Chinese religious artifacts  
The topic I chose was prehistory of spirituality/religion. The reason I decided to do spirituality/religion because I thought I would be interesting to see how strong a type of religion or faith was before writing. What I'll be manly focusing will spirituality/religious objects used for the practices during the Neolithic period in China. The point will be to see how much the religious artifacts have changed from pre-historic to modern.

**Stevens, Zachary**  
Stephanie Madrid, Kara Lavender, Taylor Mauhili, Sarah Casey, Gradi Moore  
**Faculty mentor:** Jamie Clem

**Session II, 2:00pm-4:00pm, 93B**  
**Title:** Party Shannagans  
A research project that wants to figure out the party habits of the students at NAU. This is an anonymous survey within our Social Work 355 class.

**Stoffel, Rebecca**  
**Faculty mentor:** Brandy Judson

**Session I, 9:00am-11:00am, 93D**  
**Title:** Take Action Against Stress  
Stress is a challenge every human faces. Because of the impact of stress on mental and physical health, it is beneficial to find ways to reduce stress and develop mechanisms to better deal with stress. In my personal behavioral change experiment, I chose to reduce my stress levels through daily activities and techniques that focus on reflection, mindfulness, and achieving goals. Implementing these strategies has helped me to not only lower the intensity of my stress, but also to manage the stress I have in a healthier, more positive way. While stress is inevitable, there are ways to take action and prevent it from knocking you down.

**Stogner, Sydnee**  
Aspen Blanchard, Sydney Vallin  
**Faculty mentor:** Gregory Busath, Viktoria Tidikis, Sydney Vallin, Aspen Blanchard

**Session I, 9:00am-11:00am, 80B**  
**Title:** The Relationship Between Socioeconomic Status and Depression  
Many different factors can make up someone's socioeconomic status (SES) including education, occupation, and perceived social class. The present study investigated the relationship between socioeconomic status and depression levels. To explore this, we are using a questionnaire including a
demographics form that evaluates the participant's SES level, and the Patient Health Questionnaire (PHQ-9) to evaluate the participant's depression levels. We will be using a Pearson R correlation to test the continuous variables in the study to determine the strength of the linear relationship between SES and depression. We assume that there will be a strong, negative, linear relationship between the two variables.

**Story, Dustin**  
**Faculty mentor:** Dana Ernst

**Session II, 2:00pm-4:00pm, 12A**  
**Title:** Counting primitive sorting networks  
How many primitive sorting networks exist on n elements? We review the definitions and theory necessary to understand this open question. We summarize our attempt to bound the number of sorting networks on n elements. Furthermore, we briefly discuss several equivalent representations of the problem as they appear in other areas of mathematics, computer science, and physics.

**Stott, Jessica**  
**Faculty mentor:** Gerald Wood

**Afternoon, 2:00pm-2:25pm, Skydome Roundtable R1**  
**Title:** Teaching Teachers to Teach Culture  
This project is focused on the issues involving culture within educational institutions. As a student learning to be a teacher, one is taught to teach math, science, language arts, humanities, and electives, but not taught one of the most commonly present subjects of the world, which is culture. America has become silent about race, ethnicity, and culture in the classroom. This teaches students to not ask questions and not explore alternate views and different peoples. This project will focus on why so many have difficulties talking about culture and how to better incorporate this topic into the classroom in a respectful and educational way. This method of teaching culture is a hope to defuse racism and create understanding between peoples beginning at a young age. This project will delve into silence on culture, how it forms our future society, and how to teach our future educators to use culture as an educational tool to create a country of cultural understanding and empathy.

**Stratton, Celeste**  
Jack Spicer, Yennifer Robles, Erik Buth  
**Faculty mentor:** Nicole Bies-Hernandez

**Session I, 9:00am-11:00am, 70A**  
**Title:** Introversion and Academic Lifestyle  
The academic behaviors of students expand beyond what teachers observe in the classroom. Personality is an important factor that influences students' behaviors in an academic environment (e.g., participation level and self-esteem; Dykman & Ries, 1979). The current study was conducted to help teachers understand the study habits and seat preferences of students. Participants were given a survey that asked them questions about their personality and a variety of academic behaviors. Participants were asked about where they prefer to sit in a smaller and larger classroom, where they prefer to study, and how many people they prefer to study with. It was predicted that individuals with a higher level of
introversion will (1) sit in the back of the classroom, (2) will prefer to study in a location that minimizes social interactions, and (3) will prefer lower numbers of study companions. If the predicted results were found, the results of the current study could help teachers better understand the academic lives of their students.

Strempke, Joie  
**Faculty mentor:** Britton Shepardson

**Session II, 2:00pm-4:00pm, 64A**

**Title: The Development of Religion & Spirituality**  
The prompt that I am going to be choosing and revising is the prehistory of religion and spirituality. I plan to revise this idea by showing the different religious practices that have been made in all different places all over the world from Paleolithic religion, Neolithic Religion and Bronze Age religion ect. I plan to show how religion has developed and grown tremendously over time and give examples of different forms of spiritual and religious practices that have been made all over the world for the past millenniums.

Sunda, Annette  
**Faculty mentor:** Lee Amoroso

**Session II, 2:00pm-4:00pm, 11D**

**Title: Effect of Sediment Source on Dune Activity, Navajo Nation, Arizona**  
Dune encroachment is a global phenomenon that also affects people on the Navajo Nation. To mitigate dune encroachment it is important to understand what controls dune size, movement, and growth. My study focused on two dune fields on the Navajo Nation that are supplied by different sediment sources. The dune field near Hotevilla is sourced from Cretaceous sandstone [mean grain size 0.25 mm]. The dune field near Tonelea is sourced from Jurassic sandstone [mean grain size 0.125 mm]. Between 2007 and 2013 the Hotevilla dunes had an average rate of movement of 3 meters per year while the dunes at Tonelea had an average rate of movement of 5 meters per year during the same time. Comparing the two dune fields indicates that the source area grain size affects the size of dunes and the rate of dune activity.

Sutton, Emily  
**Faculty mentor:** Gregory Busath, Viktoria Tidikis

**Session I, 9:00am-11:00am, 80C**

**Title: Effects of Sleep on Academia**  
This is a Psychology 302w class project. The purpose of this study is to see if there is a negative or positive correlation between sleep and academic performance. Many previous studies have looked at work performance and sleep effects, but not as man have looked at college students and the correlation between sleep effects and academic performance. Gilbert & Weaver (2010) state that sleep deprivation and poor sleep quality are prominent in American society, especially in college student populations. This study will attempt to look further into depth about the true issues that lack of sleep can have on the college student community. Information from this study can benefit current and future college
students, and even the people surrounding them. By understanding how important sleep hygiene is, students could potentially benefit in their academic careers.

Swartz, Amy
Faculty mentor: Alison Adams

Session II, 2:00pm-4:00pm, 107C
Title: Alternative to Animal Testing - Identification and Classification of Neurotoxic Chemicals
The goal of this research is to reduce the need for testing potentially neurotoxic chemicals/drugs on animals by developing a successful in vitro protocol. To accomplish this, we transfected NTERA-2 stem cells with plasmid DNA containing the glycine receptor gene and the yellow fluorescent protein (among others), and then differentiated the cells into neurons via retinoic acid treatment. The mature neurons, in the presence of glycine and anions, are able to visually indicate whether or not glycine is able to bind to the glycine receptors and inhibit the flow of ions into the cell (and hence indicate neurotoxicity) because the glowing yellow fluorescent protein (sensitive to anions), will dim when anions were able to enter the cell, and maintain fluorescence when anions were inhibited from entering.

Swatts, Tristan
Faculty mentor: Melissa Birkett

Session II, 2:00pm-4:00pm, 80C
Title: Noise, Instruction, and Cognitive Performance
Noise can contribute to distraction and lead to stress within a work environment. Environmental stressors can contribute to human errors and adversely affect cognitive performance. This has implications for NASA's workers. Environmental noise could be one of the challenges the Mars team will face as they prepare for the 2030 mission and complete noise abatement may not be possible. In response, the NASA Human Research Roadmap has identified adverse cognitive conditions as one potential health risk. Our proposed research will examine stress and cognitive performance on a set of computer-based tasks in three randomly-assigned groups of participants; a control (no noise) group, noise group, and a noise with instructions group. It is hypothesized that providing instructions to ignore noise will result in improved performance. The results of this research may have implications for how NASA employees working in a noisy environment may benefit from instructions to ignore distracting noise.

Swearingen, Cole
Faculty mentor: Ryan Fitch

Session II, 2:00pm-4:00pm, 42C
Title: Economic Benefits Vs. Environmental Costs of Climbing Expeditions on Mount Everest
This presentation will go into detail about the economic benefits achieved by the local people and overall country wide economy as well as the environmental costs that have come as a result of numerous mountain expeditions year after year. The issue of climbing sustainability will also come into question during this report/presentation as it is important to know when is too much, too much and if climbing expeditions can be sustainable in the long run.
Swope, Joseph  
**Faculty mentor:** Britton Shepardson  

**Session I, 9:00am-11:00am, 64B**  
**Title:** Nomadic to Civilization: The Effects on Human Nutrition  
This will be a poster that depicts the change from humans living in nomadic societies to civilizations. It will also depict how this affected human nutrition and what health problems it caused.

Talk, Athena  
**Faculty mentor:** Stefanie Kunze  

**Session II, 2:00pm-4:00pm, 69C**  
**Title:** The Effects of Mining on Tribal Nations in Arizona  
Growing research provides evidence that tribal nations are being taken advantage of in terms of land leases between companies and federal agencies. In addition to that it has been noted that the Environmental Protection Agency (EPA) is making strides to help tribal governments enforce self-determination, however the EPA cannot protect tribes from misleading information about company's intentions; thus leading tribes to form their own environmental protection agencies (Mark, 1998). Currently the state of Arizona is proposing to lease tribal lands to foreign companies for mining operations. The state of Arizona has had a long history with mining, many of which did not have a great ending. The Navajo reservation is an example of mining that left the land and its people distraught. With this in mind there is great opposition from other tribal nations to protect their tribal lands from being exploited by foreign nations. It is critical for indigenous nations to justify their obligations to protect their traditional lands and their identities, cultures and societies; and on the basis that protection of their traditional estate cannot be safely entrusted to governments or corporations (O'Faircheallaigh, 2005). The issue of state and federal governments making decisions over tribal governments in regards to land leases began with treaty-making and ultimately the allotment era. Overall it is important that American Indian peoples concerns pertaining to the environment are heard, especially at times of environmental crisis. Indigenous peoples should no longer be affected disproportionately by non-Indian and foreign companies exploiting their traditional lands.

Tanaka, Koji  
**Faculty mentor:** Xiaobing Zhao  

**Session II, 2:00pm-4:00pm, 42D**  
**Title:** Economic impact of operating/shutting down nuclear plants in Japan  
Japan being one of the major countries using nuclear energy, whether or not shutting down will have some consequences to it. It's nuclear plants have great economic significance to look into it, so I will abstract the situation in economic way.

Tapia, Kelsey  
**Faculty mentor:** Amber Nicole Pfannenstiel  

**Midday, 11:30am-12:30pm, Skydome East Concourse - ADA section**
Title: Instagram and Dogs: A Playful Discussion of App use

No abstract submitted

Tappan, Katie
Faculty mentor: Miguel Vasquez

Session II, 2:00pm-4:00pm, 64B

Title: Determining Instances of Animal Sacrifice in Archaeology Based on Animal Remains
This project looks at ways of determining cases of animal sacrifice based on the faunal remains found at archaeological sites. Some of these ways include surface modifications on bones that can be examined in terms of the tool that was used and where marks were created anatomically, as well as the manner in which the remains were deposited in the site, and other contextual factors that are indicative of ritual sacrifice. Both environmental and human created modifications will be explained and compared to allow differentiation between the two. With marks caused by human behavior, knowing the type of modification, what tool may have been used, and the anatomical location of these modifications can help determine the purpose of the butchering. Reasons for not finding a large amount of animal remains at a site where animal sacrifice is abundant will be explored. I will stress the importance of extensive recording of all data collected at the site, particularly the context in which the remains are found and any markings and modifications on all bones for analysis. Theories within anthropology will be explored in relation to this project.

Taylor, Clifton
Faculty mentor: Brandy Judson

Session II, 2:00pm-4:00pm, 93D

Title: Controlling My Anger
My topic is on changing behavior. I chose how to control my anger.

Terrell, Seth
Faculty mentor: Ernest Duebendorfer

Session I, 9:00am-11:00am, 15D

Title: Testing the Proposed Margin of the Yavapai-Mojave Boundary Zone and Field Guide
Between 1.8-1.6 Ga there was a period of extensive crustal growth in North America. Isotopic and geochronological studies split areas of the southwestern U.S. into three crustal provinces that date back to this time period: the Mazatzal, Yavapai, and Mojave. The mechanisms that produced these provinces are extremely complex and poorly understood. The boundary between the Mojave and Yavapai provinces has been identified as a 75-km wide zone with characteristics of both provinces. The eastern margin of this boundary is relatively well understood, but the western margin of the boundary is covered in colluvium and has proven difficult to locate definitively. Albin and Karlstrom (1991) proposed that the western margin of the Yavapai-Mojave boundary zone coincides with the Gneiss Canyon shear zone. This model predicts that there should a sharp contrast in metamorphic grade across the Gneiss Canyon shear zone. The purpose of this project to test Albin and Karlstrom's hypothesis by analyzing metamorphic grade of rocks from two mountain ranges that straddle the
proposed margin. The results of this project show no significant change in metamorphic grade across the proposed margin. A secondary aspect of this project was to create a field trip guide highlighting varying degrees of metamorphic grade across parts of the Cerbat and Hualapai mountains that is for undergraduate petrology students and geology enthusiasts.

Terry, Daniel  
**Faculty mentor:** Amber Nicole Pfannenstiel

**Midday, 11:30am-12:30pm, Skydome East Concourse - ADA section**

**Title:** *The False Choice: What it Does to the Gamer and the Student*

In this presentation, I focus on the concept of the “false choice”, wherein a videogame presents you with a set of dialogue options that prove to ultimately be meaningless, be it that the game forces you to make a specific decision, or the decision ends up not affecting the flow of the story in any meaningful way. I’ll be analyzing how games do this, assessing whether they are the product of lazy story-writing or a purposefully poignant theme, and applying them to situations in academia that take a similar form. The games I’ll be analyzing for this presentation will more than likely include but not be limited to Dragon Warrior (NES), The Legend of Zelda: Ocarina of Time (N64), The Mass Effect Trilogy (360/PC), Undertale (PC), and Deus Ex (PC).

Thayer, Stefanie  
Taylor Pondy, Rang Ly  
**Faculty mentor:** Gregory Busath, Alexandria Ortiz

**Session II, 2:00pm-4:00pm, 79B**

**Title:** *Sexual Harassment and Eating Disorders*

Sexual harassment is a pervasive problem among middle-school and high school students with a recent large-scale national study indicating that 52% of girls in grades 7-12 have experienced in-person sexual harassment and 36% of girls in grades 7-12 have experienced cyber sexual harassment (AAUW, 2011). The main purpose of our study was to provide an empirical test of objectification theory by examining the relationship between sexual harassment experiences, body shame and eating disorder symptoms in adolescents and young women. Additionally, this study evaluated attachment as a moderator. A series of questionnaires were administered to participants, and the current study analyzed the data to find correlations between sexual harassment and eating disorders within adolescents and young women.

Theiss, Rebecca  
**Faculty mentor:** Frederick Lampe

**Session I, 9:00am-11:00am, 64C**

**Title:** *UTV62: Connecting the NAU Community through Student Broadcasting*

UTV62 is a student-run broadcasting station at NAU consisting of approximately 70 students. Its members are primarily Creative Media and Film majors, though it welcomes students from all fields. The fact that UTV62 produces its own shows and short films, runs 24/7, meets every week to discuss ideas, and sponsors film festivals at the end of each semester motivates many to participate. Most involved join to gain the experience of working at a TV station, which is crucial for scoring a career in
Hollywood post-graduation, however students also appreciate UTV62 for social purposes since it allows them to meet others with similar interests and builds teamwork. While the experience they gain is significant, there is much dissatisfaction in how few viewers they have. A survey conducted two years ago revealed that approximately only 40% of NAU students watched the station or even knew it existed. The goal of this poster is to promote UTV62's image across campus to increase their ratings and create stronger connections between the UTV62 and NAU communities. With the use of anthropological theory, the poster will analyze UTV62's activities, advertising methods and why it is valuable to the student population.

Thomas, Dylan
    Andrew Koppisch, Rico Del Sesto, Blaine Pfeifer
    Faculty mentor: Andrew Koppisch

Session I, 9:00am-11:00am, 24D
Title: Metabolic Engineering of a Host to Increase Production of a Biofuel, Dimethylsqualene
Across the globe, people are reliant on nonrenewable energy sources, such as petroleum, to fuel all types of transportation from cars to planes to spacecrafts. Crude oil itself has a limited supply, and its isolation and processing is known to have many harmful effects to our environment. However, strategies for the production of transportation fuels from renewable materials alleviate both of these problems. Transportation fuels are a mixture of hydrocarbon chains that are produced by hydrocracking of crude oil. In many cases, metabolic pathways in a microbe may be reengineered to enable the host to generate similar energetic molecules as those within crude oil, which ultimately serves to facilitate their production from a renewable carbon source (glucose). Botryococcus braunii is an algae capable of producing up to 70% of its weight in methylated triterpene molecules, such as mono-, and di-methylsqualene. These two hydrocarbons can be refined into transportation fuels via hydrocracking. In this work, we have pursued the metabolic engineering of Escherichia coli with B. braunii hydrocarbon biosynthetic genes, to enable it to produce mono- and di-methylsqualene as a first step towards generating a sustainable route to fuel.

Thomas, Jessica
    Stella Carr, Kurtis Strauss
    Faculty mentor: Ashley Deboard

Session I, 9:00am-11:00am, 20B
Title: Reuse Shop and Sustainability Survey
Goals: To find out where the student population thinks the campus could improve, when it comes to reusing items, and promoting reducing consumption. Our end of term goal will be to have conducted a survey of a diverse student representation and come up with recommendations for ways the groups on campus which already work on consumer waste management can improve. Objectives: This will help to understand the perspective students have towards NAU and the waste minimization goals they have. This is an issue regarding one of the school's sustainability initiatives. The creation of this analysis will allow students to participate suggest ways we can reduce, reuse, and recycle more on campus. Duties: To create a survey to send out to the students. Then we will decide what seem to be the most popular ideas liked by students and either work to promote and market things that already exist on campus or what could be created in the future. Anticipated Accomplishments: Have a better idea of what the
students would like to see when it comes to 'resale' shop time creation on campus. Group member tasks and responsibilities: Stella: resource investigator, coordinator, plant, and finisher; meet with administration to develop a communication on the subject; meet with student groups. Jessica: develop a survey to inquire about student interest for the program, table, and Kurt: Develop conceptual branding, and marketing tools for the shop, and ways to get people involved.

**Thomas, Mary**  
Greg Haber, Luke Million, Austin Cibik  
**Faculty mentor:** Rebecca Maniglia

**Session II, 2:00pm-4:00pm, 101B**  
**Title: Latino Rap, Cartels and Narco Corridos**  
This poster would focus on Latino rap and narco corridos as reflections of cartel criminality. It would explore the unique nature of the Latino criminal experience and how it differs from other types of gang violence and it would address how the music connects to this lifestyle.

**Thompson, Griffin**  
Frank Furtado, Katy Waltz  
**Faculty mentor:** Ted Martinez

**Morning, 9:00am-11:00am, Skydome Honors Table**  
**Title: Scorched Earth**  
Scorched Earth is a card game that has its players to take the role of corporate CEOs attempting to harvest the most points possible from a collective pool representing earth's natural resources. Players will have to contend, not only with their fellow industrialist, but with the degradation of the earth itself. This simple game is a representation of the ongoing crisis of environmental degradation and possible climate apocalypse due to human over-consumption. Players will have to work together as they attempt to gain the most resources possible while not over extending the limits of the earth. For if they let their greed get the better of them then they will lose everything, leaving only a barren planet behind. A scorched earth.

**Thompson, Kyle**  
**Faculty mentor:** Stefanie Kunze

**Session I, 9:00am-11:00am, 69D**  
**Title: The Makah Tribe & Whaling**  
The Makah tribe have been hunting for whales, specifically Grey and Humpback whales for thousands of years but is it unethical for the Makah people to hunt these whales. The Makah people do not hunt for sport but rather to provide food for their families and to better their economy by the trading of whale oil, and on occasion for religious purposes. In 1855 the Makah signed a treaty called the treaty of Neah Bay of 1855 in their reservation that allowed them to specifically hunt these whales. The treaty of course was signed during the whaling boom in America but by today's standards is it unethical for the Makah to still hunt these whales even with their legal permission? I'd say so

**Thomson, Carl**
Faculty mentor: Frances O'Donnell

Session II, 2:00pm-4:00pm, 15C

Title: Statistical Analysis of Soil Moisture Infiltration Rates in Semi-Arid Ponderosa Pine Forests
Tree density has become an important issue in recent years, particularly in the Ponderosa Pine forest that Flagstaff is located in. Many catastrophic wild fires have been attributed to overly dense forests. In response to this threat, restoration by means of mechanical thinning and prescribed burning is planned for vast areas of forest in Northern Arizona, through a project known as the Four Forest Restoration Initiative (4FRI). This forest restoration process reduces the level of tree cover in the forest, allowing more snow to reach the ground during winter storms. Upon reaching the forest floor, snowpack generally has three options: it can sublimate and return to the atmosphere; it can melt and generate runoff, recharging local streams; or it can melt and seep into the soil through a process known as infiltration. The purpose of this research is to explore the effects of forest restoration on soil infiltration. To accomplish this, moisture probes have been installed in multiple locations throughout the Coconino National Forest, West of Flagstaff. These probes have been installed in both treated forests and untreated forests. We believe that forest restoration will have a positive influence on soil moisture infiltration rates, and that the treated sites will show higher rates of moisture infiltration than the untreated sites.

Times, Halie
Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 124B

Title: Is A Higher Education Necessary for Real Estate Agents?
My project is about whether or not it is truly beneficially for one to attend college before entering a real estate agency.

Tjaden, Savannah
Faculty mentor: Abe Springer

Session I, 9:00am-11:00am, 15B

Title: Ah poop! Estimating Real-time Fecal Bacteria Concentrations With Turbidity in Oak Creek, Arizona.
Monitoring in Oak Creek, Arizona has found Escherichia coli (E. coli) bacteria concentrations that have repeatedly exceeded the Arizona Water Quality Standard for full body contact of 235 colony-forming units per 100 ml water. Current sampling methods take 24 hours to process and cannot be used by managers to warn the public about real-time potential health threats. Previous research has determined that turbidity, a measure of water clarity, can be used as a surrogate to estimate E. coli concentrations. Historical data from high-use areas in Oak Creek were analyzed by site to assess the ability of turbidity to accurately predict E. coli concentrations. Linear regression equations were developed using the least-squares method. 50- and 90- percent prediction intervals and probability of exceeding full body contact criteria were determined from site-specific regression models. Probability of exceedance provides water managers with a single value for decision-making and prediction intervals allow the public to make educated decisions about recreating in the creek. Preliminary models are not statistically significant enough to accurately estimate E. coli concentrations. However,
these preliminary models will inform the installation of permanent continuous, in-stream turbidity monitors and will speed up the development of a robust, real-time E. coli monitoring program. Regression models will also be used to analyze the effects of Slide Fire on water quality in Oak Creek.

**Todd, Kristin**  
*Faculty mentor:* Glenn Edgerton

**Session I, 9:00am-11:00am, 121C**

**Title: The Effects of Cryotherapy on Acute Injuries**

This literature review was performed to investigate the effects cryotherapy has on acute injury timelines. In athletics and athletic training, it is important to get the athlete back to return-to-play as quickly and safely as possible. Cryotherapy could delay this process. This review covered the effects cryotherapy has on acute injuries, both immediate and prolonged effects.

**Tompkins, Anwyn**  
Ann Futterman Collier  
*Faculty mentor:* Ann Futterman Collier

**Session II, 2:00pm-4:00pm, 79C**

**Title: Birds of a Feather: Sexual Racism and Experience**

The purpose of the current study was to examine the association between past interracial experiences and positive opinions on or practice of sexual racism. Previous research on the subject has been scarce, although there is a great deal of information on the occurrence of interracial relationships. The psychological theory 'Birds of a Feather Flock Together' posits that individuals with a more similar physical characteristics ('phenotype') will be attracted to one another (Mackinnon, Jordan, & Wilson, 2011). After pilot testing, we developed a questionnaire based on the following: 1) Is Sexual Racism Really Racism? (Callander, Newman, & Holt, 2014); 2) Quick Discrimination Index (Ponterotto, Pontere, & Johansen, 2002); and 3) modified questions from the pilot survey that examined the relationship between positive, frequent experiences with other races and the choices that participants made about their partners' skin tones. Our hypothesis is that participants who have had more frequent and positive interactions with other races and ethnicities will be less likely to demonstrate sexual racism and therefore to choose, for dating or sexual relationships, individuals who are dissimilar to themselves. Approximately 200 students from NAU participated though the SONA research system. We will examine the results in terms of two potential interpretations: sociocultural factors impact mate race selection or mate race selection is based on hard-wired genetic sustainability Keywords: attraction, race, sexual racism, genetic phenotypesThis project must be presented for both the SBS section and the Honors section of the symposium.

**Toothman, Jackson**  
*Faculty mentor:* Britton Shepardson

**Session II, 2:00pm-4:00pm, 64C**

**Title: Prehistory of Sports Related Architecture**
This project looks into five different archaeological sites that were active during prehistory. Prehistory is the time before written languages documented things. The sites all have architecture related to sports, whether it be the stands for spectators or the field or court that the games were played on.

Torres, Carla
Lisa Lundin, Janeth Machuca, Jocelyn Chacon, Lorenia Lopez
Faculty mentor: Susan Stutler

Session II, 2:00pm-4:00pm, 108B
Title: Trouble in the Rain Forest: A Curriculum for Grades 1, 2, & 3
Globally minded people take action in creative and ethical ways to address the situations and issues that matter to them. They use collaboration, critical thinking and imagination to solve problems that affect all of us. However, today’s early and elementary classrooms devote more and more time to the acquisition of low-level skills through memorization as prep for an almost constant barrage of high stakes testing. In these classrooms, students sit quietly at their desks, follow directions, and don’t ask many questions. How will these children be prepared to become the problem solvers of the future? We know that children learn best when engaged in authentic inquiries that connect the big ideas of science, social studies, geography, math, and when the role of the student is to question, explore, imagine, explain, evaluate and take action! Trouble in the Rain Forest is a First – Third Grade Curriculum developed to foster questioning and to guide students as they investigate problems they find. As they explore, communicate with purpose, and study situations from different points of view, they will build understandings of the big ideas of natural resources, human responsibility, and sustainability; collaborate to assess options; and make action plans based on evidence. Finally, the students will act. In so doing, they will come to understand that their actions can make a real difference in the world.

Trapp, Brittany
Faculty mentor: Francis Smiley

Session I, 9:00am-11:00am, 64D
Title: The Chumash of Southern California: The Archaeological Correlates of a Hunter-Gatherer Society
This poster presents a visual and textual examination of the material correlates of the ethnographically known Chumash society of Southern California. Archaeologists can learn a great deal about past societies by analyzing the material record provided by the Chumash and other living societies. The Chumash inhabit the coast and inland of the Vandenberg Coastline, where they hunt, gather, and fish while sustaining a chert flake industry. The Chumash have villages along the beach and settle in hunter-gatherer groups. Despite the fact the Chumash were a mobile hunting and gathering society, and did not have permanent dwellings, they provided numerous manufactured products which detail their daily activities. I use this information to predict what material correlates will survive in the archaeological record. The purpose of this presentation is to set out a model of the kinds of material cultural items produced by the Chumash, given their social organization and other cultural factors that govern the operation of the society. The poster also presents examples of archaeological research on similar societies in order to compare and contrast archaeological realities.

Trotter, Chandler
Faculty mentor: Frederick Lampe

Session II, 2:00pm-4:00pm, 64D

Title: Looking at UTV62 by Using Applied Anthropology
Applied Anthropology is the use of the theories and methods of field to understand and provide solutions to a problem. For this project I was tasked to locate a group within the city of Flagstaff and looking into the issues that anthropology could provide a solution to. The group of interest for my project is UTV62, the NAU run student production studio/television station. The problem I wanted to look at with UTV62 was that they are not very well known by the university student body. While lacking the necessary resources to execute a well thought out solution, my capstone class has provided me with a way of creating a hypothetical plan that I could use. This plan along with additional information related to work done in my capstone such as experience created a grant proposal will be presented on a poster. The goal of the poster is to not only present my hypothetical plan, but show the kind of experience a applied anthropologist would need to go through to do their work.

Trujillo, Ashlee
Faculty mentor: Christine Lemley

Session II, 2:00pm-4:00pm, 46B

Title: Creating a Classroom of Empathy
Drawing on culturally relevant pedagogy, I will present a lesson that answers the question, 'How do we create a classroom accepting of all cultures?' to connect students with the idea that everyone comes from different places yet we are more alike than different. The students will watch a film on immigration to understand how people have migrated between countries and discuss each student's background as to where they and their families are from. By allowing each student to share part of their family history, it will contribute to creating a classroom of understanding and acceptance of every single individual.

Trujillo, Taylor
Vanessa Billegas, Estevan Hoffman, Jackii Padilla
Faculty mentor: Lisa Tichavsky

Session I, 9:00am-11:00am, 101C

Title: Police Perception in the Media
The purpose of this project is to examine the factors that influence individual's perceptions of police. This is particularly important because little is known about how the recent negative police portrayals in the media have affected the publics' perceptions of the police. We surveyed 100 students at a mid-sized Southwestern university to ask about their perceptions of the police and their exposure to negative police portrayals in the media. We measure exposure to cases where law enforcement is portrayed in a negative way versus exposure to cases where the police is the victim (i.e. officer deaths). This will allow for a clarification on the effects on perceptions when police are involved along with how our peers are reacting to it as well. We also control for the source of the information, various demographic characteristics (e.g. race) and prior personal and vicarious experience with the police. We utilize OLS regression to test the hypothesis that the more negative media one is exposed to the less favorable perceptions will be of police. In addition, we expect that greater exposure to cases where
police are the victims will be associated with higher perceptions of the police. Results and discussion are in progress but will be provided. Implications will be discussed.

Tso, Harlan
Matthew O'Neill
Faculty mentor: Matthew O'Neill

Session II, 2:00pm-4:00pm, 17B
Title: Comparing Metabolic Rates of Native Chubs Species and Non-Native Fish Species of Arizona
Arizona's water bodies have a variety of native and non-native fish species. Most native fish species are imperiled, and non-native fishes have replaced native species across much of the state. The ecological ramifications of these community changes are not clear. While stable isotope studies have described ecological differences between native and non-native fish species, little is known about energetic demands in most fish species. Here we use metabolic rates in still and flowing water to describe the energetic requirements of native and non-native fish species. Fish metabolism was measured using a custom-built flow chamber and integrated dissolved oxygen meter. Oxygen consumption of three native fish (roundtail chub, Gila robusta; bonytail, G. elegans; humpback chub, G. cypha) and four non-native fish species (largemouth bass, Micropterus salmoides; smallmouth bass, M. dolomieu; goldfish, Carassius auratus) found in Arizona was measured. Bonytail were the most efficient swimmers, using the least amount of oxygen per body length/second and able to swim at the highest water velocities. Roundtail chub and largemouth bass used similar amounts of oxygen per body length/second, while humpback were able to swim at high velocities but were the least efficient swimmers at high speeds. These differences in swimming efficiency could influence the ability of each species to maintain position in desert streams that experience floods and fast flowing water. The greater swimming efficiency of native fish species may explain why large flood events seem to temporarily restore native fish communities.

Turton, Kellen
Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 124C
Title: Slippin' Mickeys: The Subliminal Marketing of Disney
Countless man-hours are put into making a movie. Its planning stage could take months even years. Every detail, from start to finish, is overseen and incorporated into the film. But how much of that effort is being recognized by movie audiences? To many, movies are simply a means of distraction; a break from a person's everyday reality, and something to be enjoyed for an hour or two. Because movies are typically seen as mere entertainment rather than an art form, most people do not appreciate all of the hard work and detail that goes into making and producing today's mass media. This capstone project seeks to determine how aware audiences are while watching films and movies by studying the effectiveness of intentional, visual, inside jokes, hidden messages, or features in cinematic works known as Easter Eggs. Disney, one of the most influential and recognized companies the world over, has been incorporating these visual references into their movies for decades. In addition to traditional Easter Eggs, Disney has utilized this cinematic license to subtly promote itself and subliminally advertise to its audiences. Since animated movies still make up a significant portion of Disney's
creative output and are primarily targeted to a youthful audience, the focus of this study will examine each of these elements, how much viewers notice from one shot to the next, and if they can identify purposeful Easter Eggs within a film without any prompting.

Tyler, Ariana  
**Faculty mentor:** Rachel Billowitz, Shipra Bansal

**Session I, 9:00am-11:00am, 117A**  
**Title: Eating for Life: The Effects of Diet on Overall Health**  
This project will be based off of data collected from the Eating for Life class at North Country Healthcare. The class advocates a whole foods, plant-based diet. Each participant is monitored before and after completing the six week course in many areas, including weight, A1c count, triglycerides, and other chemical determinants of health. Participants also self-report on subjects such as general happiness, and generally feeling healthy.

Uphoff, Blain  
Cody Bednar, Garrett Snyder, Sara Mitchell, Deston Coleman  
**Faculty mentor:** Lisa Tichavsky

**Session II, 2:00pm-4:00pm, 101C**  
**Title: The Effects Stimulants have on Academic Success**  
The usage of stimulants or ADHD medications like Adderall, Ritalin and Vyvanse are becoming increasingly more popular for students. This study investigates whether or not the usage of Adderall or other forms of ADHD medication increase a student's level of academic success. We surveyed 100 students at midsize Southwestern university asking questions about their academic success and their stimulant usage, as well as general demographic characteristics. We utilize OLS regression to test the hypothesis that those with higher use of stimulants will score higher in academic success. We expect that students with and without a prescription are using these ADHD medications for academic purposes with hopes of obtaining a higher level of academic success during the semester. Therefore we also ask the reason for their stimulant usage. The results and conclusions of the study are in progress but will be provided soon.

Valencia, Eliza  
**Faculty mentor:** Becky Butcher

**Session II, 2:00pm-4:00pm, 124D**  
**Title: The African Hunger Crisis**  
The ongoing hunger crisis in Africa is an important issue in our world today. The crisis is mainly due to underdeveloped agriculture. Over a quarter of the world's undernourished people live in sub-Saharan African countries. Attempts to solve this issue have been slow moving in this region and today, one in four people suffer from hunger. This project seeks to determine how undernourishment is directly related to poverty and to underdeveloped agriculture. The focus of this project is to find a solution to the hunger crisis through humanitarian organizations as well as through local resources.

Van Lith, Jessica
**Katie Miller, Aden Polydoros, Kelly Lienhard, Alycia Lichtas**  
**Faculty mentor:** Will Cordeiro

**Afternoon, 2:00pm-3:00pm, Skydome Stage B**

**Title:** *The Craft of Fiction, 2*  
In this presentation, select students from HON 291: Craft of Fiction will present a reading of short stories they've written.

**Van Winkle, Helena**  
Alexander Wilson, Jake Hirsch, Jeremy Scuderi  
**Faculty mentor:** Cerissa Hoglander, Taylor Joyal, Angie Moline

**Session II, 2:00pm-4:00pm, 20A**

**Title:** *Camera Trapping at Restored Riparian Zones*  
The Riparian habitats of the American Southwest are highly diverse and delicate ecosystems. In 2013, the North Rim Ranches program within the Grand Canyon Trust began a project to restore aforementioned riparian zones in the Grand Canyon area in order to reduce the effects of historical impacts and increase biodiversity. Three years later, they have set up wildlife trapping cameras at each restored site in order to determine the effectiveness of restoration efforts. The purpose of this study is to determine whether or not the Grand Canyon Trust's restoration of riparian habitats was successful or not. To achieve this, we will be reviewing photos captured by motion activated cameras. There are about 50 photo folders containing 50-1500 photos each. We will be reviewing the photos and tabulating what animals have been visiting the restored sites. We will compare the animals and their frequencies of appearance to the typical values one would observe in a natural riparian habitat. This study will provide an accurate indication of whether or not the restoration of the riparian habitat was successful or not, from which a plan of action can be determined on how to proceed with the restoration efforts.

**Vance, Tesla**  
**Faculty mentor:** Julie Moreau

**Session I, 9:00am-11:00am, 77B**

**Title:** *Disability: Why Are We Missing from Theory?*  
This presentation confronts the ableism in academic theory and how to it applies to us as disabled people.

**Vechiola, Daniel**  
Marin Robinson  
**Faculty mentor:** Marin Robinson

**Session II, 2:00pm-4:00pm, 24C**

**Title:** *Laser ablation ICP-MS analysis of nine metals in size-segregated, submicron atmospheric particles collected in Church Rock, NM and Flagstaff, AZ*  
Knowing both the elemental composition and size distribution of atmospheric particles is important for understanding their effects on human health and Earth’s climate. Submicron particles (<1 µm in
diameter) can reach the lungs, leading to long-term health effects. Larger particles (1-2 µm) can scatter and absorb solar radiation, influencing Earth's climate. Metals are important trace constituents in atmospheric particles and are associated with particle toxicity (e.g., As and Pb) and emission sources (e.g., Ni and V from power plants). In this work, we collected size-segregated particles with aerodynamic diameters between 56 nm and 1.0 µm using a micro-orifice uniform deposit impactor (MOUDI) in Church Rock, New Mexico and Flagstaff, Arizona. The concentrations of nine elements (As, Cu, Fe, Mn, Ni, Pb, Sb, V, Zn) were measured using laser ablation inductively coupled plasma-mass spectrometry (LA ICP-MS). Iron, zinc, and manganese were the most abundant trace metals at both locations. The greatest concentrations of metals were observed in particles with diameters between 0.32 and 1.0 µm.

Velasco, Vanessa  
**Faculty mentor:** Christine Lemley

**Session I, 9:00am-11:00am, 44B**

**Title:** Where We're From

The United States is a melting pot of cultures and this is represented in our classrooms. This Sheltered Instruction Observation Protocol lesson plan is designed for a 3rd grade classroom level, but can be modified for higher grade levels. The purpose of this lesson is to teach students about immigration, more specifically to shift the mainstream idea that immigration has to do only with those coming from Mexico. Through this lesson, students will learn about different waves of immigration from different time periods and from different parts of the world to the United States through class readings. They will also investigate and research to find out where their family came from. The final project will be a class map of the world pin pointing where each student's ancestry traces back to. This way, students can see how we were all once immigrants to this country. The lesson will accommodate to English Language Learners and teach them content as well as new vocabulary. It will also open up all students' eyes to the different cultures within their own class and, hopefully, make them more open minded to our growingly diverse society.

Velde, Dominique  
Bridgette Floyd, Nalleli Perez, Brooke Anderson  
**Faculty mentor:** Lisa Tichavsky

**Session I, 9:00am-11:00am, 101D**

**Title:** Students and Study Drugs

The purpose of this study is to investigate the relationship between a student's major(s), the stress level they have and their use of Adderall or other stimulants. (Ritalin, Vyvanse, Marijuana, Crystal Meth, Cocaine, and crushed pain pills). According to Agnew's general strain theory (1992), we expect to find that those with a more stressful major (i.e. Bio-med, Pre-Law etc.) will be more likely to use Adderall or similar study enhancement drugs. We surveyed 100 students at a mid-sized Southwestern University, and asked questions related to student's stress and use of stimulants. OLS regression analysis is used to examine the relationship between stressful majors and use of Adderall or similar stimulants. The contingent effects of friend stimulating use, the pressure of trying to fit in, experimenting, the availability of the study enhancers and stress level will also be examined. Results and conclusions of this study are in progress but will be provided.
Vento, IsaBella  
Brianna Barrios  
**Faculty mentor:** Sumner Sydeman

**Session II, 2:00pm-4:00pm, 74A**

**Title:** *Treatment Methods for PTSD in Sexually Abused Children and Adolescents: A Meta-Analysis*

The efficacy of treatment methods for Post-Traumatic Stress Disorder (PTSD) has been examined in recent psychotherapy clinical trials. The purpose of this current meta-analysis is to evaluate the previous research on the effect of various treatment methods on PTSD in children and adolescents who have experienced sexual trauma. Systematic literature reviews and meta-analyses are important to assess the effectiveness of an intervention method for a particular disorder; this statistical technique is achieved by compiling multiple studies. Method: Electronic databases including PsychINFO and PubMed were utilized according to PRISMA-P standards (Shamseer et al., 2015) for randomized controlled trials (RCTs) and non-randomized controlled trials (non-RCTs).  Results: Methodology and results of located clinical trials that met inclusion criteria were reviewed and summarized. For the meta-analysis, the effect size for each clinical trial was calculated. Then, an overall effect size statistic was calculated for all of the trials. These statistical analyses were conducted using the statistical program, Comprehensive Meta-Analysis (CMA) software, Version 3. Conclusion: Key findings of the systematic review and meta-analysis were summarized. Strengths and limitations of the published clinical trials will be addressed, and suggestions for future research will be offered.

Verdy, Oswin  
**Faculty mentor:** Britton Shepardson

**Session I, 9:00am-11:00am, 65A**

**Title:** *Prehistory of Food and Nutrition: Hunter Gatherer Society vs. Agricultural Society*

This project focuses on the prehistory of food and nutrition. More specifically, it is based on how the diets of our ancestors drastically changed from what they were able to hunt down and gather, to what the were able to farm, grow, domesticate, and maintain. This transition, known as the neolithic revolution, is going to be presented through the lens of the the dietary and nutritional changes that will be formatted into a poster providing a variety of easily understood 'before and after' examples. This project will be representing our diet during this era as well as provide evidence showing how this change in our diet affected the rest of humanity down the line.

Vey, Megan  
**Faculty mentor:** Francis Smiley

**Session II, 2:00pm-4:00pm, 65A**

**Title:** *The Scottish Crofters: Material Culture and Archaeological Record*

The poster presents an analysis of the material correlates of the indigenous group the Scottish Crofters. Archaeologists can learn a lot about preexisting societies by studying the material record of living societies. The Scottish Crofters are a Gaelic speaking community located in the northwest Highlands and Isles of Scotland. A Crofter is the renter or tenant of a croft, a small unit of agriculture.
substandard land. Crofting is a way of life that is over 200 years old and is strongly connected to the land. Scottish Crofters continue to exist because their heritage gets passed down to the next generation. The kinship is an integral part of the Scottish Crofters' society. The Scottish Crofters yield very little evidence to prove relations between the crofters. The documentation of a crofter's lineage would not survive the archaeological record. However, lineage can be connected through a crofter's inheritance. A crofter's inheritance would consist of the family's croft, and the croft house. Evidence of a croft and a croft house would survive the archaeological record. The Scottish Crofts produce very little evidence that would survive the archaeological record. The point of the poster is to showcase the kinds of material correlates produced by the Scottish Crofters' social organization. The poster will also provide archaeological research to confirm the material correlates that I predict will survive the archaeological record.

Vieyra, Annette
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 65B
Title: Anthropology: The Prehistory of Food/Nutrition
My project is based on the prehistory of food/nutrition of the Europe region. I would look different ways people ate, how they struggled to get there food, and different plates.

Villa, Paola
Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 93C
Title: Behavior Change: Fitness and Wellness
As a college student, the negative effects of distress caused by school are commonly seen. I am interested in distinguishing the differences of a stressed student who lives a healthy lifestyle, versus a stressed student who lives an unhealthy lifestyle. My project is a study done on improving a personal behavior in my life. My behavior change is on personal fitness and wellness. I have committed to consistently working on my physical fitness as well as my mental health. All in hopes for a positive outcome and impact in my life. I will be observing my attitudes, sleeping habits and overall response to living a healthy life style.

Villarreal, Gabriel
Faculty mentor: Juile Moreau

Session I, 9:00am-11:00am, 74D
Title: The Affective Effects of Masculinity Racism and Homophobia Within Gay Men
The purpose of this project is to examine instances of internalized homophobia and racism throughout cis gay men and sees how the affect of shame as well pressures of hegemonic masculinity foster these oppressive mindsets. The question this project attempts to answer is what can affect theory tell us about shame and masculinity? Specifically, how does shame play a role in internalized homophobia sexism and racism found in cis gay men? In an attempt to answer these questions this project will look at previous research of homophobia and racism found throughout cis gay males. This will serve as evidence and as a basis to understand how homophobia and racism operates in cis gay males. From
this the project will observe the work done by several affect theorist on a shame and how it is consisted through individuals. As well this project will look to sociological theories on dramaturgy and role-playing. These theories will create the connections to the oppressive mindsets fostered by gay cis males. After these connections have been established the project will focus on its sample data. That being a collection of Craigslist posting by men who identify as straight seeking out homosexual encounters and experiences with only other men who identify as straight. Previous knowledge about shame and role playing will be applied to these analysis of these posting to expose the internalized homophobia in these men. This project attempts to locate the source of internalized homophobia from with in as an attempt to combat it.

Vilte, Ryan
Emily Parker, Haley Timar, Morgan Meurer, Kyle Zahn
Faculty mentor: Lisa Tichavsky

Session II, 2:00pm-4:00pm, 101D

Title: Police Perceptions
When the community has negative perceptions of the police it makes it more difficult for them to effectively perform their duties. With the recent surge of negative attention the media has placed on police, it would be helpful to know whether the negative media portrayals impact the public's perceptions of the police. Therefore, this study investigates how media consumption affects police perceptions while controlling for the effects of personal experiences and relationships with the police. Consistent with social learning theory, we also control for friends' perceptions of the police. We surveyed 100 students at a medium-sized Southwestern university asking questions regarding their perceptions of the police, past experience and vicarious experience with the police, knowledge of negative media cases, exposure to media, and general demographic characteristics. We used OLS regression to test the hypothesis that increased negative media exposure will lead to more negative perceptions of the police. The results and discussion are forthcoming but will be provided. Implications of the findings will be discussed.

Vorsatz, Victoria
Faculty mentor: Brandy Judson, Maura Kluzik

Session II, 2:00pm-4:00pm, 93C

Title: Eliminating Impulse Eating
For this project, I have selected 'impulse eating' as a behavior in which I would like to eliminate or change. Whenever I am preparing a meal for myself I have a tendency to 'impulse' eat everything while I am waiting. This is a bad habit that will eventually leave to weight gain and possibly obesity. My intention is to eliminate this habit by finding alternative things that I can do to avoid impulse eating. I will track my progress every time that I am preparing a meal by keeping a chart on the inside of my kitchen cabinet. Unfortunately, this is a habit that has led me to gain weight and in response my goal is to successfully eliminate impulse eating for 21 days in a row.

Wachara, Julie
Tanner Porter, Kylie Sage, Nathan Nieto
Faculty mentor: Nathan Nieto
Session I, 9:00am-11:00am, 30C

Title: Diversity of Tick-Borne Pathogens in Marin and Monterey Counties
Ixodes sp. hard ticks (Ixodidae), commonly known as black-legged ticks, are responsible for transmitting several diseases. Ixodes are globally known vectors for the pathogens Borrelia burgdorferi, B. miyamotoi, Babesia microti, and Anaplasma phagocytophilum which are the causative agents of Lyme disease, tick-borne relapsing fever (TBRF), hemolytic babesiosis and human granulocytic anaplasmosis (HGA) respectively. In the United States, the black-legged ticks are distributed in the Northeast, upper Midwest and along the West Coast. Consequently, these regions, experience higher numbers of cases of tick-borne diseases, yet the diversity of the pathogens throughout these areas is relatively unknown. In our study, we conducted a surveillance of four tick-borne pathogens in Marin and Monterey counties, California. Ticks were collected from several locations, identified morphologically and analyzed for the presence of the multiple pathogen species Borrelia, Babesia, and Anaplasma using qPCR genetic assays. DNA sequencing was then used to identify specific strains of each pathogen. Combined with previous studies, this data will be used to identify the geographical distribution and prevalence of these tick-borne pathogens in California.

Warda, Amanda
Alexander Ballesteros
Faculty mentor: Britton Shephardson

Session II, 2:00pm-4:00pm, 71A

Title: Excavating Databases: An Investigation of Rapa Nui Artifacts Off Easter Island
The poster presents a visual and textual examination of Rapa Nui artifacts founded off Easter Island, Chile. The research done is a collaboration with previous investigations done in the 1990s, through the contact of museums all over the globe. These letters of archived artifacts, their descriptions, and photos are inputted into a database. The purpose of this investigation is to create an accessible, online database for local people, museums, and other interested parties all over the globe to see Rapa Nui artifacts everywhere. Many artifacts were taken and not properly accounted for, equaling a loss of valuable information of and for the culture. Interested parties can scroll through a map of museums, read descriptions, and view photos of the artifacts housed by that particular museum. The goal of this investigation is to create a complete database that maintains all information regarding Rapa Nui artifacts, end-resulting in the awareness and eventual repatriation of the material culture lost from Easter Island.

Warda, Amanda
Faculty mentor: Miguel Vasquez

Session II, 2:00pm-4:00pm, 65B

Title: The Hygiene Hypothesis: How Clean is too Clean?
Development, whether in the economy, technology, or even public health, seems to cause immense issues especially within disease. Due to such rapid development in the world today, diseases have become so chronic, infectious, and widespread that it has created something to be studied upon. The poster presents a visual and textual examination of the Hygiene Hypothesis, the idea that we are too clean, and how it can explain the rise in Chronic Inflammatory Diseases. The research applied to this
examination is an anthropological perspective, allowing not just the molecular and genetic viewpoint of the epidemiologist, but also through factors of prehistoric times, culture, race, behavior, gender, sex, environment, location, and evolution.

Warfel, Patrick  
**Faculty mentor:** Nancy Riggs

**Session II, 2:00pm-4:00pm, 15A**

**Title:** *A Comparison Between the Chemistry of Cinder Deposits and Volcanoes in the San Francisco Volcanic Field*

The San Francisco Volcanic Field, located in Northern Arizona on the Colorado Plateau, is a large monogenetic volcanic field that has over 600 volcanoes, most of which are cinder cones. The large amount of volcanoes means that older eruptive events are covered by younger events. This is the case for many of the older volcanoes since they tend to form in noticeable clusters. Most of the volcanic cinder used for this project was collected from some of the younger volcanoes- SP Crater, Sproul, Crater 120, and Strawberry Crater. These volcanoes rest on the edge of tight clusters and the cinder associated with them is easily distinguishable. Getting to the correct cinder layer involved digging twelve holes of varying depths (42cm-2m). Once collected, the cinder samples were sent to the University of Michigan to have their trace elements analyzed. Once determined, the cinder's chemistry can be tied to the volcano which it came from. Doing so can help contribute to the history of these volcanoes as well as to the volcanic field as a whole.

Watkins, Tia  
**Faculty mentor:** Francis Smiley

**Session II, 2:00pm-4:00pm, 56B**

**Title:** *A comparative analysis of Tibetan nomadic tribes and earlier societies of the region using associated archaeological correlates*

This poster will compare the contemporary societies of the Tibetan Nomadic peoples with societies that previously occupied the Tibetan Plateau, using evidence found in the archaeological record. The nomadic peoples of the Tibetan Plateau are a pastoralist society which means that they are a herding society. Pastoralist societies commonly herd beasts of burden and in some cases sheep and goats. The Tibetan Nomads are also a semi nomadic, meaning that the tribe moves sporadically depending on the well being of their herd. The Tibetan Nomads herd local breeds of the Yak which provides the tribe with all of the essential goods needed to survive. The Tibetan Nomadic peoples do not stay in a single location for over the course of a season. The relocation processes require that the Tibetan Nomads do not obtain a significant amount of material goods. Therefore, The Tibetan Nomads do not produce a mass amount of material correlates or non perishable goods. I will compare the Tibetan Nomads with the preceding societies of the region using the evidence provided by the archaeological record and archaeological correlates. The archaeological correlates will be able to show the similarities and differences between the societies and their cultural attributes. The comparative analysis of the Tibetan Nomads and their predecessors will provide a deeper understanding of the contemporary culture present on the Tibetan Plateau.

Weick, Sarah
Faculty mentor: Brandy Judson

Session I, 9:00am-11:00am, 97C

Title: Behavior Change Project
This project was designed to help change an unhealthy or unwanted lifestyle behavior. The behavior chosen to change was a nail biting habit. This has been an ongoing habit of mine for the past 10 years. Techniques chosen were: using a stress ball, chewing gum, and applying a bitter nail polish. The first two techniques were ways to replace the habit and relieve anxiety and stress in healthier ways. The last technique was used to help make me more aware, and to help reduce the likelihood of me biting my nails. The overall purpose of this project was to replace an unhealthy habit with something that is healthier and more beneficial when experiencing stress or anxiety.

Weiler, Hunter
Faculty mentor: Melissa Birkett, Lucas Klein

Session II, 2:00pm-4:00pm, 128D

Title: Music and Mental Health
An examination of the effects that music has on our mental state.

Weishaar, Lisa
Christine Gonzales, Nicole Todd
Faculty mentor: Laura Karnitschnig

Session I, 9:00am-11:00am, 120B

Title: Global Health; Cervical Cancer
This project will discuss cervical cancer and its effects globally.

Wells, Matthew
Hunter Briggs
Faculty mentor: Dennis Foster

Session II, 2:00pm-4:00pm, 43C

Title: Keystone Pipeline
is it good or bad for the government to not be involved in the decision for the keystone pipeline

Wells, Nicole
Brittany Yox
Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 123D

Title: Where are the Women? A Study on the Women of Today's Art History College Courses
This essay researches the reasons for the lack of female artists featured on college-level art history syllabi, given the social, historical, and educational context.

Welter, Rebecca
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 65C

Title: The Prehistory of Art

The topic that I have chosen for my final project is the prehistory of art. The way that I will be refining my project will be based on time and location. The way that I will be doing this will be by looking at a certain location in the world. The that I want to look at is about 17 thousand years ago. Then the location that I would like to look at is modern day France bathe way that I plan to present then information that I find is by doing a poster.

Wendler, Erin
Bailey McIntosh
Faculty mentor: Sumner Sydeman

Session II, 2:00pm-4:00pm, 80A

Title: Cognitive and Behavioral Exposure Therapy for Generalized Anxiety Disorder: A Meta-Analysis

Cognitive Behavioral Therapy (CBT) is known to be a research supported treatment for Generalized Anxiety Disorder (GAD). This systematic review looks at the efficacy of exposure therapy for GAD. A systematic literature search was used to find the articles for this study. The search terms CBT, exposure therapy, worry exposure, generalized anxiety disorder, and GAD were used, and the search was limited to only English, peer-reviewed articles published between 2000-2016, with only adult, human participants. We will conduct a meta-analysis, looking at the effect of treatment across the different studies. We expect our results to support previous research which indicates that exposure therapy is an effective method of treatment for GAD.

Wenger, Dustin
Faculty mentor: Stefanie Kunze

Session I, 9:00am-11:00am, 90C

Title: Navajo Water Titles: The Last Frontier

Water title remains a contentious issue in the West, underlying vast economic inequality, institutional racism and an environment at threat from climate change. The average resident of Phoenix uses over 200 gallons of water a day, while water is severely rationed on the reservation. Going forward is a just an equitable solution possible?

Wentz, Morgan
Faculty mentor: Amber Nicole Pfannenstiel

Morning, 9:30am-10:30am, Skydome East Concourse - ADA section

Title: A Meme Discussion of Pinterest

No abstract submitted

Wertz, Michael
Ryan Schatz, Norman Clark, Brock Pellerin, Anas Alkandari, Hashim Alramadhan
Session I, 9:00am-11:00am, 1D

Title: Telecomm Wind Turbine Design and Deployment
Growing popularity in worldwide wind power is contributing to opportunities arising in diverse markets. One such market is the international telecommunication industry, specifically in India, which is seeing an exponential growth in construction of off-grid towers. These towers are primarily powered with diesel generators. As such, fuel availability and transportation can have an influence on service reliability and increasing operating costs. A wind turbine at these remote locations would assist in offsetting these costs. The Collegiate Wind Competition deployment team has developed a turbine design and related business plan to establish presence in this market. The proposed turbine concept for this market employs a horizontal axis, three bladed model with a rated power that can sustain energy needs at each individual tower location. This will be paired with a battery bank to help offset the carbon output of the generator while also providing cost savings to tower owners and operators. Extensive research was also done on permitting procedures, wind resource assessment, and market needs to ensure the design meets all customer requirements.

Wertz, Michael
  Ryan Schatz, Norman Clark, Brock Pellerin, Anas Alkandari, Hashim Alramadhan
  Faculty mentor: Karin Wadsack, David Willy, Marc Chopin, Tom Acker, Venkata Yaramasu

Afternoon, 1:15pm-1:40pm, duBois Fremont Room

Title: Telecomm Wind Turbine Design and Deployment
Growing popularity in worldwide wind power is contributing to opportunities arising in diverse markets. One such market is the international telecommunication industry, specifically in India, which is seeing an exponential growth in construction of off-grid towers. These towers are primarily powered with diesel generators. As such, fuel availability and transportation can have an influence on service reliability and increasing operating costs. A wind turbine at these remote locations would assist in offsetting these costs. The Collegiate Wind Competition deployment team has developed a turbine design and related business plan to establish presence in this market. The proposed turbine concept for this market employs a horizontal axis, three bladed model with a rated power that can sustain energy needs at each individual tower location. This will be paired with a battery bank to help offset the carbon output of the generator while also providing cost savings to tower owners and operators. Extensive research was also done on permitting procedures, wind resource assessment, and market needs to ensure the design meets all customer requirements.

West, Sarah
  Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 65C

Title: Pre-History of Domestication of Plants in Asia
This shows how humans began to domesticate plants and how they played a role in their society.

West, Taylor
  Faculty mentor: Robert Goodman, Heidi Wayment
**Session II, 2:00pm-4:00pm, 79D**

**Title: Individual Differences in Mindfulness and Quiet Ego Function as Moderators of a Neural Correlate of Self-centric Motivation**

This study examines whether individual differences in mindfulness and quiet ego function modulate a neural measure of self-centric motivation. This study represents the third and final study in a three-part sequence. The first two studies examined mindfulness and quiet-ego function as moderators of self-serving bias, a distorted form of information processing in which people take credit for successes but blame external factors for failures. This third study extends this work by examining the moderating effects of mindfulness and quiet-ego function on an established event-related potential measure of self-centric motivation using electroencephalography (EEG). The study involved participation in a series of computer games in which participants could win or lose money for themselves, a close friend, or a stranger. This study extends existing evidence by linking mindfulness and quiet-ego function with alterations in the neural processing of self-relevant information, and will contribute to understanding how these traits promote equanimity and resilience when faced with self-related threats.

Westbrook, Hayden  
Evan Bolyen, Mike Deberg, Andrew Hodel  
**Faculty mentor:** Viacheslav Fofanov

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**Session I, 9:00am-11:00am, 4D**

**Title: YAX: taxonomic assignment using metagenomic shotgun sequences.**

There is an entire world of microbes with near immeasurable diversity, completely unseen to the naked eye. Through the use of High Throughput Sequencing modern science has begun to shed light on this mysterious world. By comparing the differences in genetic code, modern techniques can determine 'who' is present in a sample. We introduce a novel pipeline called YAX which is used to assign taxonomy to provided samples. Whether it is a sample of dirt, subway grime, or your own gut, YAX will help identify members of the community using high throughput metagenomic shotgun sequences. YAX uses an iterative process. First it performs a broad survey of all sequences in the GenBank database. This dramatically reduces the size of this set of sequences for the next step, in which less stringent constraints allow YAX to clarify the informativeness of the sample reads in identifying the presence of certain organisms. Finally a detailed comparison is done to provide researchers with a metric for the confidence YAX has in the presence of identified organisms. YAX provides a robust system to manage intermediate results allowing for parameter exploration to fine-tune the provided results. This prevents unnecessary recomputation which can take weeks to perform. YAX is also highly modular and allows for entire components of its taxonomic assignment algorithm to be replaced with minimal impact to other components. These important non-functional characteristics will allow researchers using YAX to explore the state-of-the-art faster and more accurately than existing pipelines allow.

Westbrook, Hayden  
Evan Bolyen, Mike Deberg, Andrew Hodel  
**Faculty mentor:** Viacheslav Fofanov

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**Afternoon, 1:15pm-1:40pm, duBois Meadows Room**
**Title: YAX: taxonomic assignment using metagenomic shotgun sequences.**

There is an entire world of microbes with near immeasurable diversity, completely unseen to the naked eye. Through the use of High Throughput Sequencing modern science has begun to shed light on this mysterious world. By comparing the differences in genetic code, modern techniques can determine 'who' is present in a sample. We introduce a novel pipeline called YAX which is used to assign taxonomy to provided samples. Whether it is a sample of dirt, subway grime, or your own gut, YAX will help identify members of the community using high throughput metagenomic shotgun sequences. YAX uses an iterative process. First it performs a broad survey of all sequences in the GenBank database. This dramatically reduces the size of this set of sequences for the next step, in which less stringent constraints allow YAX to clarify the informativeness of the sample reads in identifying the presence of certain organisms. Finally a detailed comparison is done to provide researchers with a metric for the confidence YAX has in the presence of identified organisms. YAX provides a robust system to manage intermediate results allowing for parameter exploration to fine-tune the provided results. This prevents unnecessary recomputation which can take weeks to perform. YAX is also highly modular and allows for entire components of its taxonomic assignment algorithm to be replaced with minimal impact to other components. These important non-functional characteristics will allow researchers using YAX to explore the state-of-the-art faster and more accurately than existing pipelines allow.

**Whetzel, Alyssa**

**Faculty mentor:** Julie Moreau

**Session I, 9:00am-11:00am, 74B**

**Title: The Role of Shame in Women's Intimate Relationships**

What is the underlying reason for the relationship between sex and shame? Why is it that some women associate sex acts in heterosexual relationships with feelings of shame? How has feminism contributed to these feelings of shame? Using affect and feminist theory as the primary means of explanation, this project seeks to understand the answers to these questions, and to understand the complicated relationship that women have with their sex lives, and how modern feminist discourse breeds feelings of shame in this group of women. There is often a focus on non-heterosexual identified women's sex lives in feminist theory, and when trying to locate the sites of heterosexual women's shame, the answer for this shame comes from explanations of heteropatriarchy as the primary factor or cause of shame. While this is an important factor, this project suggests that there are incidents in feminist and gender theory that lend themselves towards the growth in feelings of shame in heterosexual women's sex lives, and will contribute a different framework, or lens, through which we can talk about women, sex, and shame, without the demonization of sexual preferences and orientations being at the forefront of the discussion.

**Whisler, Lauren**

Daniel Lawrence, Richard Avery, Samantha Lewis, Sean Shoemaker

**Faculty mentor:** Lisa Tichavsky

**Session I, 9:00am-11:00am, 100A**

**Title: Whatever it Takes**
In recent years the illegal use of stimulants among college students has increased as a means to improve chances of academic success. Adderall, Ritalin, Vyvanse, and other stimulants have been shown to cause health problems, mainly heart palpitations and cardiac arrest. The goal of this study was to obtain information that can be used to guide policy changes that can positively impact the student population by ultimately reducing stimulant use and associated health concerns. We hypothesize that academic motivation can increase students' stimulant usage and expect that analysis will determine ways to reduce academic-related use. A convenience sample of 125 students at a midsize southwestern university were surveyed asking questions regarding stimulant usage, academic motivation, stresses, and academic success. We will utilize OLS regression to test the effects of stimulant usage and stress. We expect that students experiencing high levels of stress as a result of their own desire to succeed academically will show higher levels of stimulant use. Conclusions of our study will discuss any policy changes that NAU might make to help students to succeed academically without the aid of illegal stimulants. Reducing illegal stimulant use among students can increase the health of the NAU student body and additionally help to ensure academic honesty. The results and conclusions of the study are in progress and will be provided in the future.

White, Brianna
Faculty mentor: Brandy Judson

Session II, 2:00pm-4:00pm, 97C
Title: My Behavioral Change Assignment
This project was really about me creating a new healthy habit for myself. I have been actively trying to fall asleep around 11 pm on week nights and before 2 am on weekends. During the week I go to both work and school, and some weekends I work as well. The reason for this behavioral change was to make sure I get enough sleep to have the most productive day possible. I chose my sleep schedule because I wanted to prove to myself that I could create a healthy habit and keep myself accountable for it. It hasn't been the easiest habit to maintain, but it has taught me a tremendous amount about personal responsibility and accountability. After coming up with this challenge on my own, and figuring out the types of adjustments that work and how to correct the ones that don't, I've learned that I can change anything about myself that I set my mind to.

White, Nathan
Faculty mentor: Nadine Barlow

Session I, 9:00am-11:00am, 11C
Title: Characterization of Layered Ejecta Blankets in the Southern Hemisphere of Mars
The surface of Mars is heavily cratered. These craters are surrounded by layered ejecta blankets. These ejecta blankets come in three types: single, double and multiple. The distance of the ejecta relative to crater diameter is the ejecta mobility (EM) ratio. Martian ejecta blankets are highly sinuous, often having an irregular shape instead of a circular shape; the deviation of an ejecta blanket from a circular shape is called lobateness. Using the JMars program, we measured ejecta perimeters and areas via the Mars Reconnaissance Orbiter's Context Camera (CTX) images and calculated EM and Lobateness for craters in Mars' southern hemisphere. We investigated how lobateness and EM vary as a function of latitude and crater diameter. Current results cover the 00-30°S latitude range,
and show a clear trend between lobateness and crater diameter. No obvious trends were observed in the EM data.

Whitehouse, Cody - CANCELLED
    Faculty mentor: Gretchen Gee

Session II, 2:00pm-4:00pm, 90B
    Title: Western Military Strategies Against Global Islamist Uprisings
    A world war rages. From the sand swept plains of the Sahel to the mountainous peaks of the Hindu Kush, Western forces confront Islamic fundamentalists who seek to overthrow secular regimes and impose an oppressive interpretation of Sharia. At every turn, this enemy attempts to export its terror to the wider world. Thus far, America and her allies have relied heavily on military responses to beat back the spread of Islamic extremism. Armed conflict is merely a symptom of a much larger, philosophical struggle. The only way to quell this violent belief system at its source is to win a moral and ideological debate against Islamism – a monumental task. In the short and medium term, however, the military will remain the primary deterrent. Therefore, military strategy should be refined in order to eradicate violent Islamist uprisings around the world. At risk is the further collapse of several states in the Middle East and Africa, and the genocide of Christians, Yazidis, and other regional minorities. Important lessons can be learned in comparing the relative successes and failures of Western military responses; Coalition air strikes in Iraq and Syria, CIA drone strikes in Somalia and Yemen, and the French intervention in North Africa each utilize distinct military strategies to combat the same phenomenon. Drawing from the lessons of these interventions, NATO should consolidate and refine the various engagements of Western armed forces. Meanwhile, a moral and religious struggle favoring the peaceful and tolerant interpretation of Islam must prevail over Islamic fundamentalism.

Whitman, Alexandria
    Faculty mentor: Julie Moreau

Session I, 9:00am-11:00am, 70D
    Title: Emotional Effects of Abortion
    Women who undergo abortion procedures experience immense stress, shame, and guilt, amongst other feelings due to a combination of the experience itself and the heavy social stigma against the procedure. The question in which this research project wants to look at is what can an affect theory informed analysis reveal about the emotional impact of abortion? In one of the articles I had read it discussed in the introduction how women do not directly experience the emotional trauma from the abortion itself but from outside sources such as social backlash against women who go through with the procedure. The study also looks at ways in which care providers can tell who is and is not more susceptible to emotional trauma following the procedure, stating that women with previous cases of depression, women of color, and women who were less educated were more likely than not to need additional help with post abortion coping (Foster, Gould, & Kimport, 2011). The second article read was a literature review of studies conducted prior to 1990. Even at this time some of the information discussed is still relevant today, supporting the claim that post abortion trauma is more likely due to outside variables rather than the abortion itself. Due to time constraints this research project will be conducted as a literature review rather than an original study. As for expected results, I am expecting
to see further support for outside sources rather than the abortion itself creating the post abortion trauma seen in women (Turell, Armsworth, & Gaa, 1990).

Whitney, Christopher
Uzma Tahir, Jeremy Petak, Kiisa Nishikawa, John Georgas
Faculty mentor: Kiisa Nishikawa, John Georgas, Uzma Tahir, Jeremy Petak

Session I, 9:00am-11:00am, 6D

Title: A One-At-A-Time Sensitivity Analysis on the Winding Filament Hypothesis (WFH) Model
Skeletal muscles are the mobility, temperature control, and store energy machines of vertebrate animals. The sliding filament theory of muscle contraction was proposed 50 years ago and can not explain how muscles react suddenly to changes in length. The winding filament hypothesis (WFH) is a novel theory of muscle contraction that proposes the role of the spring-like protein titin in this behavior. WFH has been derived into a mechanical model with springs (a parallel spring and a series spring), a pulley, a damper, and a motor. With the biological analogs being the cross-bridge cycle of muscles, the tendon, the spring-like protein titin, and the winding action of the protein. Using this mechanical model, mathematical equations were derived making it possible to run simulation tests. The purpose of this study was to conduct a one at a time sensitivity analysis on the WFH model to determine which parameters are the most sensitive to change. This analysis enables us to see which parameter contributes the largest factor to the output, which gives insight into the robustness of the model. Running this type of analysis is significant because it shows possible errors in the model, the effectiveness of the model, and helps guide research efforts. The results of this analysis showed that smaller values in the titin spring constant under lengthening leads to higher error values and that when the muscle was turned off the error values were much higher.

Wickstrom, Sydnee
Faculty mentor: Francis Smiley

Session I, 9:00am-11:00am, 65D

Title: Huron, Farmers of the North
Sydnee Wickstrom
The poster presents a visual and textual examination of the material record of the ethnographically known Huron Tribe of the Northern Grate Lakes. Archaeologists can learn a great deal about prehistoric societies by closely examining the material records left behind. The Huron were a small chiefdom society on the northern shores of what is now Lake Huron. The Huron used their connections with other northern tribes to trade goods and services. The Huron are said to have been a culture reliant on horticulture. The Huron people tended to crops such as corn, squash, and sunflowers, gathering wild roots and plants to substitute any gaps in vegetation. Huron men hunted small game and fished to supply a heartier caloric intake. Although the Huron thrived in their way of life, unfamiliar disease from the European explorers and war with southeastern tribes wiped the Huron almost completely out. Few Huron people survive today, identifying with other tribes they sought shelter with. The purpose of this presentation is to set a model of the kinds of material correlates left behind by the fleeing and dying Huron people. By examining these cultural artifacts, archaeologists are able to put the broken pieces of Huron life together; returning some culture back to the people who abandoned it in order to save their lives. The poster presents examples of Huron sites and other findings.
Willadsen, Mariah  
Faculty mentor: Becky Butcher

Session I, 9:00am-11:00am, 123A  
**Title: GPA of Athletes vs. Non-Athletes**  
The purpose of this study is to examine the grade point average of student athletes vs. non-student athletes. I will be analyzing student athletes based on the sport, year, and gender. The study proved to have a significant difference in the overall grade point averages of athletes vs. non-athletes.

Williams, Analise  
Bradley Dishong, Kelye Scarborough, Felicity Short, Dr. Michael Alban  
Faculty mentor: Michael Alban, Melissa Birkett

Session II, 2:00pm-4:00pm, 80B  
**Title: A Physiological Marker of Defensive Freezing in a Cognitive Paradigm**  
In addition to a flight/fight response, animals and humans alike may exhibit a freeze response when other defensive behaviors are unlikely to be effective. Prior studies found that presenting unpleasant or threatening pictures to human participants leads to reduced heart rate (bradycardia) and other physiological markers of freezing; however, almost no empirical data are available on how cognitive factors affect freezing. One primary goal of our research program involves exploring how reducing the perceived efficacy of fleeing or fighting increases selection of a behavioral freeze response; our exploration could contribute to understanding of psychopathologies such as post-traumatic stress disorder (PTSD) and other stress-related conditions. The purpose of the present experiment is to link our research to extant literature on defensive freezing, which we pursued by measuring heart rate using sensors during a computer program in which participants decided to have a virtual character flee, fight, or freeze in response to the approach of a dangerous animal. Consistent with prior studies, we predicted a significant reduction in heart rate on freeze trials relative to flight/fight trials and/or baseline. Our inclusion of both physiological measures and cognitive factors should lead to a more complete understanding of the human freeze response.

Williams, Grant  
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 65D  
**Title: Weapons and Warfare of the Neolithic and Bronze Age**  
A look back at artifacts found during the Neolithic and Bronze Age has brought forth a variety of evidence in the form of weaponry and warfare. Artifacts found from multiple cultures demonstrate how historic cultures were able to defend themselves, hunt for food, and even conduct war with others. Evidence found tells a story of exactly how these weapons were used, and why they were constructed in such a way. Locating artifacts is key to completing full research of a culture, and as we can tell, artifacts of weaponry and warfare have allowed a clear image of the past to be recreated.

Williams, Nichelle  
Faculty mentor: Melissa Santana, Jessica MacKenzie-Forschler, Sara Maier
Session I, 9:00am-11:00am, 52B

Title: An Alternative Way of Living for Adults with Special Needs
Families with adults with special needs often face many obstacles. Where should they live? How do we know they're being cared for? Are they happy where they are? From personal experience, these questions can cause stress, anxiety, and worry about loved ones. In many instances, unfortunately, adults with special needs are neglected and taken advantage of. They often are living in unhealthy and isolated environments, stripped of their rights to independence and a good quality of life, simply because they're not 'normal' and do not function as highly as the general population. It is time awareness is raised, and we work together, as families and as communities, to help these individuals gain their independence and support them in a positive, healthy, and loving way. Studies have shown that individuals who suffer from intellectual disabilities actually function better when they are part of an inclusive community or environment, as opposed to institutions or facilities. These positive environments give them the opportunity to grow, learn general skills for living, and help socialize them with the general public. Facilities and institutions teach dependence and make them feel as though they're unwanted. My design is specifically for adults with intellectual disabilities, in the beautiful setting of Flagstaff, Arizona. Implementing alternative types of therapies including, animal, yoga, and art will not only give residents a variety of activities, but these treatments have been shown to improve behavioral problems, verbal communication, socialization, and motor skills including, but not limited to, balance and posture. Open, symmetrical, and simple layouts will help residents easily move around and find their way. Neutral and earth tones will be used throughout, and subtle pops of color will add fun and interest without overwhelming the individuals. The homey, organic, and contemporary elements used will help the residents and staff alike, feel comfortable and at home, rather than that they are in a healthcare facility.

Williams, Shaylee
Faculty mentor: Amber Nicole Pfannenstiel

Morning, 9:30am-10:30am, Skydome East Concourse - ADA section

Title: A Meme Discussion of Young Adult Literature Community
A Meme Discussion of Young Adult Literature Community will be focused on memes created for young adult books. I look for circulated memes that portray the views of the readers, and how they connected with the books. The memes may display quotes from books, powerful character moments, or well liked scenes.

Williams, Taric
Faculty mentor: Marie Baker-Ohler

Session I, 9:00am-11:00am, 85B

Title: Rhetorical Solutions to the Problem of Xenophobia
As the world marches toward globalization and inevitable intermingling, while at the same time dealing with mass displacements caused by global conflicts, developed populations in the west have become sharply, distinctly reactionary in a socially toxic manner. Between threatening rhetoric, advocacy for laws that disproportionately target marginalized communities, and blatant misrepresentations of foreigners and minorities in media, now is the ideal time to utilize
communication research that accurately describes--and solves--these problems. By reviewing dozens of case studies regarding how outgroups are constructed, this research accurately describes how xenophobia is fomented. Negative constructions of outsiders include manufactured economic concerns, as well as restriction of spaces newcomers in communities can safely gather. Problems are also found through discourse analysis, measuring the frequency of negative language and other aggression in mass and technical communication. Solutions are rooted in theories such as Sonja Foss' Invitational Rhetoric, which creates a space for equity and dialogue between communities. Other methods are interpretive, utilizing the findings of polls throughout the social sciences to put into practice the types of dialogue that reduce prejudice and inspire communities to unify.

Wilson, Catlyn  
Faculty mentor: Scot Raab, Glenn Edgerton

Session I, 9:00am-11:00am, 121D  
Title: Flat Foot Deformity: A Case Study  
The treatment of flat foot deformity in a high school aged male. Comparing his treatment to studies on similar conditions. The purpose was to determine if the athlete received the best possible treatment for his flat foot deformity.

Wilson, Cheyenne  
Faculty mentor: Christopher Lanterman

Session I, 9:00am-11:00am, 46C  
Title: The Importance of Person-First Language in the Classroom  
This poster will illustrate how and why teachers should implement person-first language in their classroom. Dr. Joan Blaska's work, 'The Power of Language: Speak and Write Using 'Person First',' will lay the foundation of how words directly impact the learning environment. Through study of other such sources, including the Spread the Word to End the Word campaign and the instructional tools created by the Texas Council for Developmental Disabilities, teachers can start to understand how person-first language is more than just political correctness. Person-first language is about communicating in a way that places humanity at the forefront. This mode of communication is largely preferred by people with disabilities and promotes respect in the classroom. While establishing an atmosphere of trust and comfort, person-first language also aids in collaborative learning and encourages engagement. Understanding how to properly introduce person-first language into the classroom can assist teachers in creating an inclusive space that helps every student learn.

Wilson, Michael  
Faculty mentor: Britton Shepardson

Session I, 9:00am-11:00am, 66A  
Title: Domestication of Animals  
Man's best friend is a phrase that is heard an endless amount of times. However, many have not put much thought into this. The domestication of dogs and other animals dates back to around 10,000 years ago. If it wasn't for this vital innovation this would be a completely different world.
Wimbrough, Katie  
**Faculty mentor:** Stefanie Funze

**Session I, 9:00am-11:00am, 90A**

**Title:** Western Impact on The Makah Tribe  
I will be researching the topic of how western way of life has impacted the culture and lifestyle of the Makah Tribe in Washington. Such as whaling rights and/or lack of.

Wojdyla, Gabriella  
Shayla Butcher-Sliffe, Sara Dresler, Karla Witte  
**Faculty mentor:** Ted Martinez

**Session II, 2:00pm-4:00pm, 105D**

**Title:** America's Sweetheart  
This presentation examines the effects of the importation of sugar by the United States of America on the current Standard American Diet (SAD), as well as the economic and political environment it creates. Through looking at the facts presented by our research, we hope to expose the excessive quantity at which Americans consume sugar, and in turn, the effect it has on overall national health.

When compared to the standard of health present in the rest of the global community, the United States falls far below an acceptable standard of nutrition. This American way of life has expanded beyond the consumption of sugar by penetrating the economic community and impacting the political landscape of not only the United States but also the nations with which the United States trades and conducts affairs.

Wolf, Atticus  
**Faculty mentor:** Neil Cobb, Lindsie Mccabe

**Session II, 2:00pm-4:00pm, 30B**

**Title:** Local Adaption of Megachilidae bees along and elevation gradient  
Bees are a very diverse group of insects, that can occupy a variety of different habitats and environments, which can range from dry arid habitats to cool and wet habitats. Bees have a wide range of sizes and colors depending on where they live and what they make their nest in. Within a local group of bees there are variations in the types of bees present. We determined if these local groups of bees vary at all by color and by size based off of their location along an elevation gradient. We took a sample of the Megachilidae family and compared their body color and volume. We took images of the bees in order to measure the qualities we looked for. We conducted this project to determine the differences in bee's adaptations to their various environments along an elevation gradient. It is important to know this information so we can further categorize and study these bees. We found a correlation to body color and volume in the bees. Bees that live higher in elevation tend to be larger and darker than those that live at lower elevations.

Woods, William  
**Faculty mentor:** Abe Springer, Frances O'Donnell

**Session I, 9:00am-11:00am, 16B**
Title: Soil Moisture Retention Comparison in Gradational Burn Severity of the Slide Fire Area: Thinned vs. Unthinned Ponderosa Pine Forests on the Southern

The ponderosa pine forests of the Southern Colorado Plateau stretch across a 6,000,000 acre region of northern New Mexico and Arizona. Ponderosa pine is the dominant variety of tree in the region, and is a crucial part of the habitat. The purpose of this study is to attempt to provide quantifiable data that reflects the idea that forest-thinning treatments can reduce the risk of high intensity wildfire, which will help to secure the safety of the soil and its moisture retaining properties. Using time domain reflectometry, the percent soil water content across areas of low to high burn intensity will be measured in thinned and unthinned areas of the recent Slide Fire in the Coconino National Forest. These sites will be compared with proximal control and treated sites in an unburned area that is part of a concurrent study on soil moisture retention in thinned and unthinned, unburned ponderosa forests in the Coconino National Forest. I expect to prove that forest restoration treatments reduce high intensity wildfire that can cause hydrophobicity that hinders the ability of the soil to retain moisture.

Worrell, Brayden

Brayden Worrell, Zachary Sabol, Korey Holaas, Jess Robinson, Michael Evans, Scott Muente

Faculty mentor: David Willy, Karin Wadsack

Session I, 9:00am-11:00am, 2A

Title: NAU Collegiate Wind Competition 2016 Tunnel Team B

Northern Arizona University has participated in the Collegiate Wind Competition (CWC) every year since 2014, building a wind turbine to test with the assistance of the US Department of Energy and the National Renewable Energy Laboratory. Tunnel Team B makes up one third of the Engineering portion of the team, and focuses on the electrical components of the turbine, including the power electronics, battery, software, and controls. The turbine will be brought to New Orleans with selected team members, and subjected to a number of tests to gauge how well-designed the turbine is.

Worrell, Brayden

Brayden Worrell, Zachary Sabol, Korey Holaas, Jess Robinson, Michael Evans, Scott Muente

Faculty mentor: David Willy, Karin Wadsack

Afternoon, 2:05pm-2:30pm, duBois Fremont Room

Title: NAU Collegiate Wind Competition 2016 Tunnel, Electrical

Northern Arizona University has participated in the Collegiate Wind Competition (CWC) every year since 2014, building a wind turbine to test with the assistance of the US Department of Energy and the National Renewable Energy Laboratory. Tunnel Team B makes up one third of the Engineering portion of the team, and focuses on the electrical components of the turbine, including the power electronics, battery, software, and controls. The turbine will be brought to New Orleans with selected team members, and subjected to a number of tests to gauge how well-designed the turbine is.

Wright, Aaron

Faculty mentor: Marie Baker-Ohler

Session II, 2:00pm-4:00pm, 82D

Title: Bringing Together the Police and Public Through Communication
The purpose of this project is to highlight a growing problem in effort to bring together two different groups. The current interpersonal relationship between the police and the public is rapidly deteriorating. Through a communicative standpoint, this project explores the important issues regarding this divide including: How our actions transcend generations, the interpersonal communication held between the police and public, and what role stereotypes play in this divide. With using communication theory CMM (Coordinated management of meaning) as its foundation, this paper seeks to change worlds of meaning. The result of this change concludes in a brighter future for all involved.

Wristen, Zoe  
**Faculty mentor:** Melissa Santana, Glenn Wristen

**Session II, 2:00pm-4:00pm, 52C**  
**Title:** Planning for the Future

For this project I have designed a new structure for Passion Church, located in Tucson, Arizona. This church is rapidly out growing their current facilities and will soon need a new campus that will better accommodate their needs. These needs include a larger sanctuary to accommodate more people, a safer children's area, an administrative space with offices, plenty of storage and classrooms, a bright and active youth space, and many more. I have approached this project using research related to creating a sense of place and fellowship as well as technical aspects that will create a functional space.

Wyman, Kyle  
**Faculty mentor:** Taylor Joyal

**Session II, 2:00pm-4:00pm, 16A**  
**Title:** Debris Flow Potential in Slide Fire Area

Every year the southwestern United States struggles with preventing and combating forest fires during the dry seasons. The risks associated with the wild fire unfortunately do not stop following a fire; effects can persist for years and can threaten nearby communities, including public and private assets. Of these post fire threats for the southwest, debris flows can occur in association with summer monsoon rains that can bring high intensity rains. Debris flows are a mixture of water and debris, flowing down a slope, with 50% of the material being larger than sand. When combined with hydrophobic soils, decreased vegetation, steep slopes, and overall decreased cohesion of the soil, high rainfall intensity can trigger debris flows. This project was designed to create a debris flow risk map of the Slide Rock burn area by combining existing spatial data from the burn area into Geographic Information System (GIS). Additional field reconnaissance was used to establish a sense of the topographic diversity and burn intensities within the area affected by the Slide Rock Fire. The focus of the project was to evaluate the debris flow risk by generating a GIS model based on individual mapped characteristics relevant to factors contributing to debris flows such as slope angle, aspect, burn severity, flow direction, and flow accumulation. These layers were reclassified to represent low to high contributing risk and then combined to create a debris flow risk map. Subsequently, field visits to areas representing different degrees of risk were conducted to assess the model.

Yates, Caitlin  
Julie Moreau
Faculty mentor: Julie Moreau

Session I, 9:00am-11:00am, 70B

Title: Representations of Sexual Minorities in South African Media: Does Same-Sex Marriage Matter?

In 2006, South Africa became the first African nation to pass national same-sex marriage legislation. Since that time, domestic and international media has presented South Africa as nation simultaneously 'ahead' of its African counterparts in terms of Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, and Plus rights, yet stricken with ongoing gender and sexual violence. Using English print articles from 1977 through 2015, this research examines the effect of media representation of LGBTQIA+ individuals and communities on the cultural, political, and social acceptance of sexual minorities in South Africa, and how these media influenced changes lead to South Africa's legalization of same-sex marriage, as well as how the passage of same-sex marriage legislation affected these media representations. Upon the qualitative examination of print articles for similar themes and coding using MXQDA Miner, this research attempts to answer the question of if South Africa's drive to legalize same-sex marriage was a result of widespread LGBTQIA+ acceptance due to media representation, or a reaction to the lifted oppression of apartheid. Same-sex marriage has been a major social and cultural topic for the past decade, with a major drive in Western countries to legalize marriage as a human right for LGBTQIA+ peoples. Examining South Africa's post-apartheid drive for equality for all minorities groups via mass cultural incentive, this research broaches the tentative topic of colonial and native dissonance in regards to LGBTQIA+ acceptance in Africa.

Yellowhair, Jonathan

Faculty mentor: Alisse Ali-Joseph

Session II, 2:00pm-4:00pm, 69D

Title: New Life, New Purpose.

New Life, New Purpose is a program that will instate day cares into nursing homes on the Navajo reservation. Our Navajo elders in nursing homes have a vast amount of knowledge and nearly all of them can speak Navajo fluently. With our culture and way of life quickly fading, we can utilize this valuable center of knowledge that already exists while also ensuring that our elders are not lonely and isolated in the last years of their lives.

Yox, Brittany

Faculty mentor: Becky Butcher

Session II, 2:00pm-4:00pm, 127B

Title: Women in Art

In this research project, I will be examining the relationship between women in art history and how they are represented through the classroom environment. Why are women not as involved in the education curriculum such as men are? This will take us through the achievements of women artists and what they bring to the art world today.

Zimmerer, Noah

Erich Kroneberger, Chris Wieduwilt, Zach Olson, Keifer Dunham
Faculty mentor: Julie Heynssens, S.D. Holland

Morning, 9:45am-10:10am, duBois Southwest Room

Title: NASA Orion Spectrometer

NASA's next generation manned spacecraft must undergo intense, atmospheric reentry that places the craft and crew in danger. This project designed and tested a spectral data acquisition system to work towards a safer reentry of the NASA Orion Spacecraft. The spectrometer will measure the light intensity and distribution of radiation on the heat shield of the spacecraft upon atmospheric reentry. This data will then be used for further research by NASA to craft a more resilient and safe heat shield. The team has researched and chosen several components that will be used for the final design, including two spectrometers. Several commands have been programmed for the spectrometer itself, including retrieving the spectral data. These parts have tight specifications on wavelength, power, radiation-hardness, and data rate that required verification in the lab. The team has chosen and tested hardware and developed software requested by NASA in order to implement this spectral data acquisition system.

Ziskovsky, Jolana
Faculty mentor: Christine Lemley

Session II, 2:00pm-4:00pm, 46D

Title: Cultural Dance

Drawing on culturally relevant pedagogy, I will present a lesson that answers the question, How do we teach culture in P.E? That is the question I am going to answer with my research proposal. I am going to answer this question by showing a unit plan about different cultural dances and how to get students to explore culture while still following the state standards for physical education.

Zupin, Thomas
Faculty mentor: Britton Shepardson

Session II, 2:00pm-4:00pm, 66A

Title: The Tools and Weapons of the Stone Age

My project is going to consist of three parts, Who, Where, and When. I will go in depth with each part and correlate all information back to my main topic of weapons and tools of the Stone Age.