2014

# 2014 Abstracts Student Research Conference

Student Research Conference
*Western Kentucky University*

# Abstracts of the 44th Annual Student Research Conference

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**Gary A. Ransdell Hall**
**Western Kentucky University**
**Bowling Green, Kentucky**

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**Adams, Shelby** "Risky Business? Risk Taking Personality Traits And Their Effect On Error Processing" (Brandy Tiernan)
Personality traits affect the way in which we cognitively process information and perform tasks. Risk taking, a trait marked by impulsive decision making, has been linked to poor error processing and attentional control. We examined conditions under which these processes might be improved. Subjects completed measures examining personality and emotion regulation before completing a variation of the Stroop task. The task included four conditions to assess the effects of incentives and feedback on error processing: (1) punishment for errors w/ feedback, (2) reward for correct answers w/ feedback, (3) feedback w/ no incentive, and (4) no feedback or incentives. We expect to find differences between each of the four conditions and plan to determine if task performance correlates with risk taking and similar traits.

**Adu, Bright** "Advancing the Processes of Cost Control for Construction Projects" (Ahmed Khalafallah)
Controlling the cost of a project is essential to its success, and accordingly the purpose of cost control is to limit expenditure to the agreed budget of the project. The design of an effective cost control system helps the contractor manage the budget allocated to the project and meet its predetermined set of objectives. This research aims at exploring the processes used in controlling cost in construction projects. The objectives of the research include highlighting the importance of cost control to the success of projects, identifying the key attributes of an effective cost control system, implementing cost management systems, and establishing performance measurement procedures for the system. Existing literature on cost control processes will be analyzed in order to identify and select the systems with the highest impact on performance. The expected outcome of this research is the development of a model that could be used to advance cost control processes for major projects.

**Aghenta, Ese; Macy, Gretchen; Shearer, Darlene; Lartey, Grace;** "Using The Theory Of Planned Behavior To Explain Physical Activity Among College Students" (Gretchen Macy)
The health benefits of physical activity include improved cardiovascular health, reduced rates of metabolic diseases and weight maintenance (United States Department Health & Human Services, 2008). According to American College Health Association National College Health Assessment (2012), only 19.5% of college students in the United States meet recommended levels of physical activity. This study seeks to understand the behavior and intentions of Western Kentucky University students towards physical activity using the Theory of Planned Behavior as a guiding framework. The study is a cross-sectional survey administered to students in Personal Health courses. Information will be collected on demographic variables and other factors influencing physical activity behavior among PH-100 students.

**Al Hussein, Zaid** "Best Practices For Managing Multiple Construction Projects" (Ahmed Khalafallah)
In today's world, construction managers are often required to handle multiple simultaneous projects, which poses significant challenges to the objectives and outcomes of these projects. This research focuses on identifying the factors that impact managing multiple projects, including the constraints and challenges in handling these projects. The study also investigates the best practices for managing multiple projects in an attempt to provide practitioners with the necessary tools to control project objectives. The methodology of this study relies on data collection through the administration of survey questionnaires to professional construction managers and reviewing case studies to verify and validate the findings. The outcomes of this research include a list of proposed best practices and techniques to handle multiple construction projects.

**Allender, Corbin** "Implementating A Matching Algorithm For Roommate Pairing" (Uta Ziegler)
Matching algorithms can be found in use all over today: from Facebook apps that help you find "the one" to matching medical school students with residency programs. This project applies the "blossom"

algorithm from graph theory to create the “best” roommate pairing among a group of individuals. Every person in the group has have exactly one roommate – nobody may be left out. Given survey data about each individual, their numerical similarity, or “distance”, to another person may be calculated. An overall matching can then be found such that the sum of roommates’ “distances” is minimized and the matching is relatively stable under minute changes. This presentation describes work in progress and includes a discussion of the approaches used for creating the roommate pairing and for investigating the quality of the resulting pairing.

**Althauser, Meghan** "Wku Student Teaching Abroad Program- Professional, Cultural, And Character Impacts On Elementary, Middle, And High School In-service And Preservice Teachers" (Fred Carter)
This project focuses on researching the effects of participation in WKU’s International Student Teaching Program on in-service teachers and current preservice teachers The program’s effect on teachers’ professional decisions made in the classroom and attitudes toward diversity in the classroom will be the focus of research. A mixed method approach of in-service teacher questionnaires and interviews, preservice teachers interviews, analysis of post-teaching abroad interviews by in-service teachers, and analysis of blogs/journals from the in-service teachers while they were abroad will be used in this project. The expected results of the project will be to discover the benefits of participating in the International Student Program for in-service and preservice teachers, and encourage more participation in the program.

**Amonge, Augustine** "Managing Ethical Hot Spots in Aviation Project Management" (ahmed khalafallah)
The main objective of this paper is to identify the core ethical issues in aviation project management, with the intent of raising awareness on how project managers can tackle these issues. The paper also emphasizes the importance of having a set of guidelines in an organization to help eradicate ethical issues which would help improve efficiency. Specifically, the main aim of this study is to compare among ethical practices from around the world in the aviation domain. The results emphasize the need for further training on the ethics of project management and also indicate that organizations lose financial and personnel resources, if ethical issues are not resolved.

**Anderson, Denise; Turner, Leah;** "Comparison Of Objective And Subjective Evaluation Of Equine Stress Levels In The Therapeutic Riding Environment" (Petra Collyer)
The benefits of equine-related therapies are widely acknowledged, but few studies have addressed possible stress levels in therapeutic riding horses. This has a direct impact on handler and rider safety, horse welfare and overall success of therapy programs. Welfare assessment of horses usually includes neuroendocrine and autonomic nervous system evaluation, and behavioral description. We will elucidate whether instructors and staff at a therapeutic riding facility accurately identify emotionality and stress in the horses and whether existing assessment procedures can be improved. Personnel evaluate horses using a questionnaire, to which we correlate the horses’ salivary cortisol levels, heart rate variability, and ethogram-based reactivity and behavior ratings measured during controlled tests and normal riding lessons.

**Anderson, Noelle** "Better Emergency Care For The Deaf Population Through Improved Communication" (Ashley Fox)
There is a great need in the Bowling Green, KY area for better emergency care for the Deaf through improved communication between the fire department, police department, medical center, and the Deaf community. Currently, training for emergency responders in American Sign Language (the language of the American Deaf) is not available. I have created a survey with which the Bowling Green Deaf community can identify the signs they consider most pertinent for these departments to learn. Posters,

pocket cards, and a training video are then being made with these specified ASL signs to be given to each of these three entities. This will better prepare emergency responders for communication with Deaf individuals, thereby enhancing the care provided.

**annarapu, shashidhar; nee, matthew;** "Thermal Analysis Of Binding Of Organic Pollutants To Titanium Dioxide" (matthew nee)
Photocatalytic degradation on titanium dioxide is an effective technique for removing stable organic compounds from waste water. Direct oxidation by electron holes requires the target compound to be adsorbed onto the photocatalyst. To study adsorption properties on titanium dioxide, we performed thermal analysis on four different classes of compounds: iodinated x-ray contrast agents (XRC, iohexol and diatrizoate), polycyclic aromatic hydrocarbons (PAH, perylene and pyrene), the antibacterial agent triclosan, and the pesticide atrazine. PAH and triclosan shows much less adsorption onto the surface of titanium dioxide. Oxidation by radicals is the most likely route of degradation for these classes of compounds. Triclosan and atrazine show higher adsorption on to TiO2. Direct oxidation by electron holes may be possible for these compounds.

**Archer, Rachel; Wichman, Aaron;** "Mood And Experience: Effects Of Ostracism On Diathesis Activation" (Aaron Wichman)
This study examined how ostracism as a temporary stressor can trigger existing diatheses and cause increases in depression symptoms among at-risk people. Theory suggests that ostracism is likely to trigger symptoms of depression in at-risk people. This study is an extension of a study conducted by Luxton, Ingram, & Wenzlaff (2006) in which people with naturally varying levels of diathesis factors were exposed to a self-esteem and future event likelihood threat, after which diathesis activation and depressive symptoms were assessed. Like Luxton et al, 2006, we exposed participants to a stressor (ostracism) and measure depression symptoms and measure depression symptoms and diathesis activation with different measures. We expected that for people who possessed diatheses, the ostracism threat would activate symptoms of depression.

**Armistead, Morgan** "The Architectural Development Of Young Minds" (Laura Leach)
A daycare facility should revolve around the educational and recreational activities of young children. Research included building typology, sustainability, daycare codes, and methods of play; finding what is necessary to facilitate the development of young minds. Uniting these pieces into the design of a building that includes the necessary amenities that accommodates the children in situations they might encounter each day, was the purpose of this research. Creating a space that invites children to grow into their personalities involves the understanding of psychology and scale of smaller humans. The design's purpose is to accommodate Logan Aluminum's staff and employee's children. The outcome becomes place for children come learn and have fun in a safe and contained environment during their parents working hours.

**Armstrong, Aaron** "A Zinc Finger Protein Array For The Visual Detection Of Pathogen-specific Dna Sequences" (Moon Soo Kim)
Zinc finger proteins (ZFPs) provide a modular DNA binding structure that can arranged in tandem to recognize specific sequences. Sequence-enabled reassembly of β-lactamase (SEER-LAC) is the recombining of the two inactive fragments based on proximity to one another, achieved by being sequentially attached to the ZFPs. Using SEER-LAC, the ZFP binding domains have exhibited quantitative assays with a detection limit of 50 fmol of target DNA. We have also attached full length alkaline phosphatase to the ZFPs to combine the ZFP array with electrochemical redox reactions, aiming to improve the sensitivity. Electrochemical detection is being compared to the SEER-LAC method of detection to provide a direction for future experiments.

**Atherton, Ethan; Leach, Laura;** "Networking Alumni With Current Students To Create Unique Internship Opportunities" (Laura Leach)
Research evaluates the feasibility of creating a program that will partner current undergraduate students with alumni to assist with homestay and internship opportunities across the country. Research conducted by Sarah Hall at the University of Nottingham, shows the importance of alumni networks when "first entering the work force following graduation" as well as after "their careers progress" (Hall, 2011). This program would provide the necessary resources for opportunistic students to gain their first field-related job experience, and lead them to becoming prominent professionals in their field. This networking program could be applied to academic, professional, and social science programs through innovative relationship between knowledge-based practices and social interactions.

**Atherton, Ethan** "Improving Acoustical Interior Environments Of Sustainable Design" (Laura Leach)
Research evaluates the solutions to acoustical problems created by sustainable design. According to "post-occupancy evaluations conducted by the Center for the Built Environment (CBE) at the University of California, Berkeley… green building acoustics are typically worse than their traditional counterparts"(LogiSon). Typical acoustical problems created by sustainable design pertain to: reflective surfaces, open ceilings, narrow spaces, demountable wall systems, open plans, and high-efficiency HVAC systems (LogiSon). Proposed acoustical solutions being researched are hoistable acoustical panel dining tables, cork surfaces, floating floors, and noise reduction by vegetation. This research can be applied to concert halls, restaurants, and offices for a more comfortable acoustical environment.

**Austin, Andrew; Arbuckle, Greg;** "Improving Process Capability In A Computer Integrated Manufacturing (cim) Cell" (Greg Arbuckle)
With the rise of automation in traditional manufacturing processes more companies are beginning to integrate CIM cells on their production floors. Through CIM cell integration, companies have the ability to reduce process time and increase production. One of the problems created with CIM cell automation is caused by the dependency the sequential steps have on one another. Dependency created by the previous step increases the probability that a process error could occur due to previous variation. One way to eliminate this dependency is through the use of an in process measuring device such as a Renishaw spindle probe used in conjunction with a CNC milling machine.

**Austin, Porshia; Austin, Porshia; Reed, Whitney; Savage, Jalyn;** "The Effects of Using Teacher Praise" (Wanda Chandler)
As educators, one goal is to provide all students with the opportunity to succeed in a positive classroom environment. In order for educators to establish such an environment, praise statements should be implemented. There are many ways in which praise statements can be varied to create a positive classroom environment. The research conducted in this study provides teachers with recommendations of how to effectively incorporate the use of praise statements in their classrooms.

**Bagshaw, Jarad** "Kentucky Blue: A Living History Of The Blues In South Central Kentucky" (Erika Brady)
I will be performing excerpts of songs from Robert Johnson, John Lee Hooker, Jimi Hendrix, Stevie Ray Vaughan, and Gary Clark Jr. I will highlight the differences and explain how each one has influenced the blues. I will then explain my thesis project by stating that I am just one of many blues musicians in our area that has been influenced by this music. I will explain how I have interviewed or am in the process of interviewing many great musicians and recording with them to create a living history of the blues in our area. This will also go along with a written history of the blues that begins in the early 20th century in Kentucky. I will conclude my performance with an original blues piece that I will play on guitar and sing.

**Bailey, Harrison** "Social Media And Self Advertising" (Matthew Tullis)
Social Media and Self-Advertising Harrison Bailey "How do I impact the digital world?". The answer to this question is simple: it is what we do that directly influences how we are seen in an ever expanding media-based world. Through the use of creative self-advertising, I propose that a well-placed image in context to key buzzwords will gain attention through the use of various social media websites (e.g., twitter, blogspot, or Instagram). I will be presenting the raw materials used such as stencils, air brush kits, spray paint and other physical media along with the digitally manipulated final poster for the advertisement. Upon completion of this poster it will be uploaded to various Social Media sights with the intent of gaining attention of as many people as possible. This process will show the advertisement as a serious piece in art culture as well as a way to generate a reputation for myself as a designer.

**Banchy, Anton** "The Trial Of Carmello Musso In 1914 Milwaukee" (Michael Ann Williams)
Journalistic accounts of cases tell us much about social conditions of the era in which they were written. This study uses the pages of the Milwaukee Journal to illustrate the treatment of Italian immigrants in early twentieth century Milwaukee, by examining Carmello Musso's murder trial. This case study also looks at elements of how society viewed women in the early twentieth century. Special attention is paid to how this case differed from various cases of women murdering their husbands in Chicago during the same time period. Special attention will be paid to defendant's age and race. In examining how District Attorney Yockey manipulates his key witness, Carmello Musso's niece, Rosa De Gratione, this case illustrates how legal proceedings from one hundred years ago differ from those of today.

**Bandegi, Mahdi; Khenner, Mikhail;** "A Coupled Pde Model For Morphological Instability Of A Multi-component Thin Film During Surface Electromigration" (Mikhail Khenner)
In this study we investigate, through an elaborate mathematical model, the effects of electromigration and wetting on morphological stability and dynamics of a multi-component, solid thin film in a high-temperature environment typical to a manufacturing process. We assume anisotropies of the diffusional mobilities for two atomic species on an isotropic surface (thus constant surface energies) and negligible stresses in the film. The goal of the modeling is to describe and understand the time-evolution of the shape of film surface. The two-variable height function of film surface,h(x,t), will be computed from an initial-boundary value problem for a nonlinear parabolic PDE. To this end, we will present the results of Linear Stability Analysis.

**Barnes, Lorena; Schroeder, Amber; Bourland, Austin; Morrison, Alesha;** "Can Facebook Be Faked?" (Amber Schroeder)
The purpose of this study is to examine the extent that Facebook profiles can be faked in hiring situations. To study this, we have created a sample Facebook profile, and will ask participants to distort the profile to create the impression of a desirable (or undesirable) job candidate. We will also give participants individual difference measures such as personality, attention to detail, and technology skills. Each distorted page will be rated by independent raters on likelihood to hire. We expect to find that participants will be able to fake, but individual differences will impact the extent this is possible. If our findings show that profiles can be significantly distorted, this will be important information for companies using social media in hiring decisions, as profiles may not be an accurate depiction of job candidates.

**Bartee, Marrquon; Bartee, Marrquon;** "Evolution Of The Critique: An Examination Of Modern Hollywood Cinema Through Modern Ediums." (Jerod Hollyfield)
Marrquon Bartee Hollywood has seen many faces and changes. Film itself exist as a medium for storytelling as well a collimation of various art forms. Film much like theatre often reflects the morals and values of our world. This can especially be seen on the sociopolitical level. In the modern era film

has reached new extremes, which lead to many controversies and criticisms. As film evolves so do the mediums of criticism for it. A medium that is equally controversial as it is critical is the video game industry. One video game in particular that has captured the torture porn, remaking and digital age of film is the Grand Theft Auto series. The most recent Grand Theft Auto game GTA V has captured the current state of film in a comical and incredibly controversial way. Through careful analysis I will explore GTA V's portrayal of Hollywood.

**Baugh, Kimberly; King, Rodeny;** "Isolation and characterization of mutant bacteriophages that grow on an antitermination defective E. coli host" (Rodney King)
Mutations in the highly conserved zinc binding domain of the beta prime subunit of E. coli RNA polymerase blocks the growth of phages that use a unique RNA-based mechanism of transcription antitermination. Here we describe the isolation and characterization of phage mutants that overcome this block. To identify the mutation(s) that allow phage growth, the sequence of the wild type and mutant phage genomes was determined. Surprisingly, the genomes differed by only 2 nucleotides. Close inspection of the nucleotide changes suggested the mutations created a new promoter. This prediction was confirmed by cloning the respective regions from the wild type and mutant phages into a promoter probe expression vector. We hypothesize the new promoter allows the expression of phage genes that are critical for growth on the mutant bacterial host.

**Beasmore, Nicholas; Hankins, Dalton; Annam, Ramyasree;** "Mortar Cube Studies Using Type Iii Portland Cement With And Without Microfibers" (Shane Palmquist)
Mortar is a quasi-brittle, compressive material. Cubes may be cast in order to compare strengths. The focus of this paper is to present the results of mortar cubes tested in compression, with and without microfibers. Results show that the cubes with microfibers behave in a more ductile manner than cubes not containing microfibers.

**Benson, Nicholas** "A Lack Of An Era For Woman Filmmakers" (Jerod Hollyfield)
There are films that will never be forgotten, and constantly praised throughout time. When taking a look at who has made the majority of these movies there is a general theme, and knowledge, that they are mostly made up of socially and financially privileged white males. There is an era of great movie makers in history, and many of them continuing to make history today. There is generally not one woman even thought about when thinking of great eras of filmmaking. The industry is still dominated by the men, making it harder for women to find a voice. My research will show how in our current modern day world of filmmaking women are starting to be recognized and have a voice. There are more opportunities for women in this business, but it is not made easy by production companies, and the continued power of the business going to the men.

**Bertram, Linn, Peach, Jakob, Allison, Ryan** "Scada Test Bed" (Stacy Wilson)
A SCADA, or Supervisory Control And Data Acquisition, system is a computer-controlled system that monitors and controls industrial processes remotely. Electric grids, water supplies, and pipelines are all significant SCADA systems. These systems can be controlled and monitored remotely. They are typically composed of multiple programmable logic controllers (PLCs). The goal for this project is to be able to remotely access PLCs that operate systems that simulate a traffic intersection, a water tank, and a power grid. The SCADA system should be created with one PLC and one computer interface for each testbed, and it must be able to monitor the state of each system over a LAN connection and send commands for control at a distance. Attacks on the systems can also be introduced into the systems to demonstrate vulnerability to cyber attacks.

**Binkley, Tyler** "Quasi-linear Convective System Climatology For Kentucky And Tennessee" (Gregory Goodrich)
Quasi-Linear Convective Systems (QLCS) are linear storms that form along a cold front. Operationally, QLCS tornadoes are difficult to forecast due to their small size, brief lifespan, and unclear radar signal which leads to minimal forecast lead times compared to longer-lasting Super Cell (SC) tornadoes. An analysis of 777 tornadic storms was conducted for Tennessee and Kentucky for the years 2000-2012. Each storm was categorized as a SC or QLCS. Analysis was done using Level 2 NEXRAD radar data from the National Climate and Data Center, GRLevel2 Analyst, and archived data from the Storm Prediction Center. The following research questions were addressed. Of the tornadoes that strike Tennessee and Kentucky, what percentage are QLCS? How does this percentage vary by time of day and season? What are the fatality rates for QLCS and SC tornadoes? Analysis showed that super cell tornadoes caused the most damage while QLCS tornadoes were more likely to occur at night.

**Bishop, Timothy** "Digital Self Promotion" (Matthew Tullis)
Digital Self Promotion Timmy Bishop This project is a balance between contemporary digital art techniques and a mix of traditional print methods with more modern graffiti stencil aesthetics. Historical hand lettering references are made with the Blacklettering. The intent of this work is to create a successful graphic while building a mystique and allure to fellow designers as to how the image was constructed. Social media has become a format in which a digital image can reach millions in moments. The raw materials and finished poster will be on display as well as a social media strategy. I plan to present the following graphic materials at the 44th WKU S.R.C.: the raw materials used to build the graphic, final printed promotional image and a flow chart of prediction and final results of online reaction to my design.

**Blackburn, Nathaniel; Gani, Nahid;** "Ethiopian Plateau Cenozoic Incision Phases: Thermal Modeling" (Nahid Gani)
Situated along the East African Rift, the Ethiopian Plateau has undergone multiple events of uplift, and incision by the Blue Nile. Tectonic activity and unroofing of the plateau have affected the thermal history of the region. While lithospheric activity initiates increase in elevation, erosion by river downcutting expedites the process. To understand the cooling history of the plateau we have applied AHe (Apatite Helium) dating to samples collected from a vertical profile of the Blue Nile canyon. Our data provided dates much older than previous nearby studies. To better explain the correlation between our dates and radiogenic materials eU (Effective Uranium) we employed radiation damage accumulation and annealing thermal model. This work will allow us to identify timeline and mode of Cenozoic incision phases and calculate long-term incision rates of the Ethiopian Plateau.

**Blaetz, Taylor; Walters, Will; Hahn, Lance;** "Is Lol Really A Word?" (Lance Hahn)
The Spreading Activation Theory of Semantic Processing suggests that a mental representation will activate semantically related representations (Collins & Loftus, 1975). We hypothesized that new words (e.g., LOL) found in informal communication will integrate into existing networks. To test for this integration of new words into existing mental lexicons, we used semantic priming to probe links between informal and formal words. Each participant completed a lexical decision task in which an informal target word or non-word was preceded by a formal prime word that was either semantically related or unrelated. Participants indicated whether the target was a word or not. Real targets were recognized faster following a related prime than an unrelated prime, $t(28) = 4.92$, $p < .001$, $d = 1.85$. Thus, formal words can prime informal target words.

**Blauw, Jessica** "Reframing Psychological Pathology Through Existential Themes" (Grace Hunt)
Certain psychological and physiological behavioral patterns can limit a person's ability to actualize their

identity in healthy ways. There are theories within the fields of cognitive psychology and feminist philosophy which describe examples of these patterns. The examples presented by each of these theories appear to have similarities in their causes and manifestation. By focusing upon the descriptive components of the related theories, one can establish a specific pattern of behavior which suppresses personal growth and development. The form of personal development which is directly affected can be understood through a framework of individual existence established by existential philosophy. These themes in cognitive psychology, existentialism, and feminist philosophy can be used to recognize and diagnose inhibitors to one's well-being.

**Blythe, Emily; Blythe, Emily; Dennison, Amanda;** "Behavioral Contracting for K-12 Students" (Wanda Chandler)
This poster provides examples to implement behavior contracting strategies in K-12 classrooms. These behavior contracting strategies will facilitate improved student behavior. Behavioral contracting refers to a written contract that describes a child's behavioral obligations. In addition, reinforcers (teachers' or parents' obligations) are outlined for when the child has met the contract's conditions. In research conducted by Cutrell (2010), middle-school students with emotional/behavior disorders (EBD) were examined. The research demonstrated that behavioral contracts decreased the participants' targeted, inappropriate behavior. The following details are outlined: For whom and why behavioral contracts are used; how to implement behavioral contracting in the classroom; examples of rewards for compliance with behavioral contracts; and example of contracts.

**Bolton, Charles** "Adjusting Multiple Correlations For Regression Overfitting And Indirect Range Restriction" (Reagan Brown)
Studies of the relationship between scores on predictor tests and measures of job performance quantify the relations between them with a correlation coefficient. This correlation is adversely affected by a variety of influences including range restriction and, in the case of multiple predictors, regression overfitting. Equations are available that correct for the effects of these influences; however, the combined use of these correction equations has not been investigated. The efficacy of and proper procedures for adjusting correlations for the combined effects of regression overfitting and indirect range restriction are the focus of this research. The present study uses Monte Carlo analyses to investigate the joint implementation of these two adjustment procedures. Results show that the use of the two equations does not increase error.

**Boothe, Mary** "Rebranding The Wku Office Of Sustainability" (Kelley Coppinger)
Over the past few years, the WKU Office of Sustainability has struggled with general program and initiative awareness as well as student engagement in university sponsored sustainability activities. Attempts to target and capture an audience have been inconsistent due to lack of budget and staff, resulting in varying levels of success. The purpose of this project is to identify, through a population survey, a student market that is interested but unaware of the information, services, and initiatives provided by the WKU Office of Sustainability. Once identified, the market will be assessed using statistical data and focus groups to determine the most effective messaging options available based on the office's current budget and implementation power.

**Bouchard, Emily; Hoover, Don; Arnett, Scott;** "Integrating Guided Motor Imagery And Cross Education Into Rehabilitation: Scientific Review And Clinical Application" (Don Hoover)
Background: Guided motor imagery (GMI) and cross education (CE) are concepts based on motor programs (MP) and used in physical therapy (PT). GMI works by imagining a given action, thus activating the respective MP without actual motion. CE uses contralateral training to activate the MP within a resting limb. Both methods yield neurological actions and improve performance outcomes into

PT. Purpose: This project investigated GMI and CE within the scientific literature, identifying evident themes and providing suggestions for use within PT. Methods: An electronic search of peer-reviewed articles was done on GMI, CE, and PT. Discussion: Despite few studies, evidence exists for the effectiveness of these methods and provides insights on how these methods may be successfully used in PT. A summary of evidence and suggestions are provided.

**Bowlds, Michael; Coppinger, Kelley;** "Kentucky Radio 2020" (Dick Taylor)
Radio is approaching its one-hundredth birthday in the year 2020. What does exactly that mean for the industry? How will Radio continue to grow in the future? Using an online survey program, I created thirty questions covering past, present, and future operations of radio stations in Kentucky. I sent the survey to the upper management of various music and talk stations and the answers were eye-opening. The extreme importance of stations using social media to connect with listeners and immense expected job growth in the area of online operations are just a couple of revelations from the results. My findings are intended to help current broadcasters compare and improve their operations, show broadcasting students what jobs will be in demand and give listeners a better understanding of their beloved medium as it celebrates a century of existence.

**Bratcher, Nicholas** "The Use Of Prophecy In The Pauline Epistles" (Joseph Trafton)
The use of spiritual gifts such as tongues and prophecy has been a major source of controversy within Christianity over the past century. As its use flourishes in Africa, Asia and South America, many in the Western Church remain skeptical of its use, some even questioning the true conversion of these "charismatic" Christians. Though it doesn't seek to answer questions of cessation, this thesis does seek to establish a foundation for such a discussion by outlining what Paul envisioned as the role of prophecy and prophets in the early Church through an examination of the apostle's epistles in the New Testament. Other scholarship that seeks to examine the Biblical use of such gifts in modern churches may thus build upon these findings.

**Brent, Kyle** "The Importance Of Preventative Care And Oral Health" (Jeffrey Rice)
The importance of oral health's effect on overall health is poorly understood by the public; at the same time, the importance of preventative dental care in ensuring good oral health is understated. The "Importance of Preventative Care and Oral Health" uses a broad spectrum of scientific research studies to establish the importance of preventative care in achieving good oral health. Building on this, the paper explains the connection between good oral health and good overall health. Preventative dental care results in good oral health which is directly related to good physical, emotional, and mental health, all of which lead to longevity. For Americas' oral health and overall health to improve, all healthcare professionals must work together to educate the public about the importance of oral health.

**Brindley, Charlotte** "Dragons Of East And West: The Savior And Enemy Of Mankind" (Ingrid Cartwright)
The dragon is a mythical creature depicted in the art of cultures worldwide, and its symbolism in Western and Eastern cultures varies greatly. This paper analyses how the dragon portrays the cultures' beliefs, respectfully. In the West, the dragon's roots in antiquity was mankind's fear of nature. With the rise of Christianity, Christians used the dragon of folklore to evoke their triumph over paganism and Satan, thus the dragon became an evil entity in Western culture. In the East, the dragon was a divine creature of the elements, and prayed to as gods. In Imperial China, the emperor embodied the dragon and was the protector of the country. Because of its positive nature, the dragon was often rendered in art. Though different, the dragon in the respective cultures was symbolic of nature and molded to the belief systems.

**Briscoe, Richard** "Museum Of Romani Culture: An Ethnographic Study Of Museum Impact" (Darlene Applegage)
The Museum of Romani Culture in Brno, Czech Republic documents the history and culture of the Roma people, pejoratively known as gypsies, and promotes Roma social empowerment and cultural awareness. Using interviewing, participant observation, thematic analysis, and secondary data analysis, I examined the effects of assimilation on Czech Roma traditional lifeways, and the overall impact of the museum on its visitors and the local Roma. My paper documents the political, social, and cultural challenges of an institution governed and operated by cultural outsiders. I conclude that the museum has not yet fulfilled its mission. This is largely due to limitations imposed by the Ministry of Culture, and the ever-growing intolerance towards the Roma.

**Broadrick, Amy** "Hookah: A Fun Fad Or Harmful Habit?" (Lynn Austin)
Hookah smoking has been a well-known activity in the Middle East for hundreds of years. More recently, hookah has become a worldwide phenomenon, especially in the United States of America. It is important to know why people choose this habit, and specifically why teenagers and young adults are becoming the main frequent users. An interview session consisting of a questionnaire is currently taking place. This session involves a total of twenty individuals. Ten of these individuals will be people who actively participate in smoking hookah. The other ten interviewees will be individuals who have never smoked hookah. The researcher will discuss the effects that hookah has on the overall health of the individual. Last, the data will be analyzed to determine if there are significant differences among those who smoke hookah and those who do not.

**Brown, Erika** "Reexamining The Equipollence Of " (Audrey Anton)
Alberto Giacometti's sculpture, Suspended Ball compels art theorists such as Rosalind Krauss to explore the relationship between concepts such as love, violence, and the profane. Theodor Adorno, who introduced the concepts of dialectic relationships in order to provide characteristics that aided in the definition of art, also explored this field. I will expand upon Krauss's interpretation of Suspended Ball and bridge a relationship with her analyis and Adorno's dialectics of art. Also, I will manifest a new perception of the unity between, in my terms, "pornographic" and "intellectually stimulating" art. These two ideas have been divided into distinct categories. Therefore, I will provide an account of the ways in which Suspended Ball re-establish the equipollence of the "pornographic" and "intellectually stimulating" artworks.

**Broyles, Courtney; Vice, Ellen; McKeith, Russell; McKeith, Amanda; Shen, Cangliang;** "Thermal Inactivation Of Escherichia Coli O157:h7 In Moisture Enhanced Non-intact Beefs As Affected By Internal Temperature, Moisture Enhancing Rate, And Resting Time By Double Pan-broiling" (Cangliang Shen)
Escherichia coli O157:H7 may translocate from the meat surface to internal tissue during non-intact beef moisture enhancement process. This study evaluated the effect of ME rate, resting time on the inactivation of ECOH in reconstructed non-intact beefs cooked to various internal temperatures.Fresh 1kg coarse-ground beef knuckles, inoculated with ECOH were mixed with NaCl+Na-tripolyphosphate solutions to reach a10 or 18%ME rate. Semi-frozen beefs were cut 2.54-cm thick, vacuum-packaged, frozen, and tempered before double pan-broiling to internal temperatures of 55, 60, 65 and 71.1°C with 0.5 or 3.5-min rest. Temperatures of the grill and beef were monitored with thermocouples. Internal temperature of 65 and 71.1°C achieved higher reductions compared to those of 55 and 60°C. 3.5 min rest time or 18%ME acheived additional reduction.

**Brusendorff, Anne Sofie** "A Case Study On Carlsberg's Csr Strategy And Its Effect On The Company's Current Position And Competitive Advantage In The Brewing Industry" (Patricia Todd)

Corporate social responsibility (CSR) and sustainability are extremely important for a firm to be competitive in today's business environment. An extensive literature review will provide examples of the positive and negative impacts CSR can have on business success. The paper explores the evolution of CSR and gives an overview of the effects CSR can have on a company's reputation. How companies can use CSR as a competitive advantage and scholarly views both for and against CSR are also highlighted. Furthermore, an in depth analysis on the Danish Brewery Carlsberg will be provided by answering the following question: "Does the CSR strategy contribute to Carlsberg's success and does it provide long term competitive advantages for the company?" The paper will conclude by illustrating how Carlsberg benefits from their current CSR and if the company could make their CSR more successful.

**Bryant, Benjamin** "Architecture And Music" (Laura Leach)
Architecture is music; the way the building flows is its harmony. Phi Mu Alpha, a music fraternity, has been on campus for 52 years and has never had a fraternity house. I am designing one for them. The research included music halls, music practice rooms, fraternity houses, green sustainability, and building codes for assembly and residential buildings. The research gave me different floor plans from different type of fraternity houses, I found ways to make my house green and sustainable and I found the codes I have to follow for an assembly hall and residential buildings such as apartments. I applied my research to the house and the results designed a fraternity house that is sustainable, up to code and would be a great place for Phi Mu Alpha to gather in harmony, spend time together and play music.

**Bucklew, Timothy** "Learning Project Management Techniques Through Multiple Entrepreneurial Experiences" (Stacy Wilson)
Student workers for the Engineering Manufacturing Commercialization Center have opportunities to work on projects in all fields. Due to the nature of the Center, most students have multiple projects in progress at any given time. These projects all have different deadlines and needs based upon the requirements. A project is defined by its requirements. With a good understanding of the requirements, a project can move through the various phases of its life cycle. Each phase of a life cycle is crucial to reach the next. Project management is recognizing when a phase of a project can be postponed without compromising the integrity of the phase, and then prioritizing projects based on the deadlines of the their current phase.

**Buckley, Tori; Ison, Gabrielly; Swisher, Merritt;** "Expression And Purification Of Human Fibroblast Growth Factor-1 And Its In Vitro Interaction Studies With Aminoglycoside" (Rajalingam Dakshinamurthy)
Fibroblast growth factors (FGF's), work as modulators of different cell activities like mitosis, differentiation, survival etc. Among FGF's, Human FGF-1(hFGF-1) is the potent angiogenic factor, involved in the formation of new blood vessels in tissues. In this project we have tried to study the possible interaction of kanamycin, another aminoglycoside, with hFGF-1. Expression and purification of FGF-1 in recombinant E.Coli was carried out and monitored through SDS-PAGE analysis. Conformational stability of protein was assessed through steady state fluorescence.

**Buechler, Jacob** "Haunted Here; All With Me: Pareidolic Realities And The Spaces Where The Darkness Peers Back" (Ann Ferrell)
Drawn from my master's thesis, this presentation explores a concept that I am calling pareidolic realities. Pareidolia is defined as a psychological phenomenon involving a vague and random stimulus - examples include seeing a face on Mars or the Virgin Mary in a piece of toast – which is perceived as significant. Culturally, hauntings are significant because they are an amalgamation of random elements that are imbued with supernatural expectation, which in the end form pareidolic realities. This talk will attempt

to establish how we as humans cognitively frame in the theatre of our minds, haunted spaces such as, closets, backseats, and graveyards as significant haunted environments. Pareidolic realities hold cultural influence, for others and ourselves as we continue to share and experience supernatural landscapes.

**Bunch, Justin; King, Rodney; Rinehart, Claire;** "Discovery And Genomic Comparison of Bacteriophages Bustinjunch And Kimya" (Rodney King)
There are approximately 10^31 phages in the biosphere, making them most abundant biological entities known to science. They are genetically diverse and play a primary role in bacterial evolution. The purpose of this project was to gain insight into the diversity of the bacteriophage population by isolating and characterizing new bacteriophages from the environment. To complete this task we isolated phages from different environmental samples using Mycobacterium smegmatis as the host. The purified phages were observed using electron microscopy, and their genomes were analyzed by DNA restriction analysis. Although the phages, named BustinJunch and Kimya, have similar morphologies, the restriction analysis suggests they are unrelated. Our results provide supporting evidence that the global phage population is diverse.

**Burke, Lindsey; Snyder, Kaitlyn; Chambers, Nicole; Mienaltowski, Andrew; Lemerise, Elizabeth;** "Do Older Adults Really Decline In Their Emotion Perception Ability? New Results From An Emotion Matching Task" (Elizabeth Lemerise)
Previous literature suggests that older adults are less accurate than younger adults at recognizing emotion in others' faces, but it is unclear whether these age differences are due to increased cognitive demands or due to age-related changes associated with detecting the appropriate emotional cues needed to accurately apply a label. In the current experiment, we sought to reduce the cognitive load by asking younger and older adults to complete an emotion matching task that involves a comparison of facial features between simultaneously presented stimuli. Overall, younger and older adults did not differ in emotion matching performance, although there were some age interactions with emotion and intensity. This suggests that younger and older adults are more similar in their ability to detect emotional cues than was thought.

**Bush, Neal; Kline, Matthew; King, Caleb;** "Press Fit Engineering" (Joel Lenoir)
Each WKU mechanical engineering student is required to complete a senior design project in a capstone class which spans both semesters of their final year. Each project is associated with an external industrial partner who provides the task to be completed. Our partner is DSSA in Beaver Dam, KY. DSSA supplies tens of thousands of airbag inflation devices each day to the country and the world. The inflators are assembled automatically for production and manually for prototyping. Our task is to design a more automatic press to alleviate worker strain in the manual assembly process. Utilizing our improved design, DSSA's overall productivity and accuracy in the testing process will be improved. The project incorporates many facets of our engineering education to include CNC machining, 3D modeling, and systems and controls design.

**Butler, Kaitlin** "Extreme Skin Friction" (Chris Byrne)
This research developed a technique to measure the extremes of friction between a finger and touchscreen glass. In order to increase test repeatability, skin conditioning protocols were created using skin hydration measurements. This approach allowed testing of fully hydrated or dehydrated skin. Using a custom friction test device, we then tested various types of glass under different hydration conditions. The results show that friction coefficients as low as 0.3 are likely with a dehydrated finger. However, a hydrated finger generated coefficients as high as 2.1. Also, different glass coatings and sliding speeds yielded diverse results. The protocols developed provided substantially reduced deviations in the data. This effort helps engineers quantify the difference in touchscreen qualities, particularly the distinctions in favorability.

**Butler, Kort; May, Michael;** "Diagenetic Compartmentalization of a Late Mississippian Reservoir in Warren and Butler Counties, KY" (Michael May)
Bitumen and heavy oil deposits in south central Kentucky are present within several Carboniferous siliciclastic strata distributed along the margin of the Pennyrile Plateau and associated with the Pennyrile Fault System. The Big Clifty Sandstone Member of the Golconda Formation hosts both conventional and unconventional oil in a variety of traps. Diagenetic alteration resulting from redox reactions at the basin margin formed an intrastratal seal with secondary calcite and pyrite precipitation (i.e. replacement) destroying and overprinting primary framework grains and cement. Diagenetic calcite precipitation and hydrocarbon saturation predominantly follow internal rock fabric in studied cores but in some cases replacement is so extensive calcite has precipitated as masses of poikilotopic cement discordant to primary sedimentary structures.

**Camfield, Elizabeth** "Increasing Flexible Thinking: Mindfulness, Working Memory, And Insight Problem Solving" (Jenni Redifer)
Problem solving tasks can be approached with complex solutions that require focused attention, or may benefit from more creative approaches that rely on diffuse attention (e.g., insight problem solving). Individual differences in working memory capacity (WMC) have been shown to influence insight problem solving, such that those with higher WMC perform more poorly on insight problem solving tasks than those lower in WMC. Mindfulness meditation (MM) has been shown to increase performance on these tasks, even though MM has been shown to facilitate higher WMC. The present study explores this contradiction by examining the effect of MM on insight problem solving performance, while also measuring individual differences in WMC. Preliminary results indicate that MM aided insight problem solving in low- as well as high-WMC participants.

**Carey, Kevin** "The Impact Of The Shortage Of Safe Assets On The Global Economy" (David Beckworth)
Over the past two decades, the rising of global imbalances in the world economy led to many fears that eventually the world would satiate their demand for safe assets, and that the continuously rising U.S. trade deficit would create a lack of confidence in the United States' safe assets. As a result, the dollar would depreciate wildly, the U.S. would lose its financing for its deficit, and a crisis would ensue. Several years following the emergence of these theories the world did experience a Great Recession, but global current account imbalances were not the primary culprit as predicted; instead, the unfettered housing boom, poor regulation of financial institutions, and illogical monetary policy decisions created a scenario in which a recession was unavoidable. However, the dollar remained the largest reserve currency in the world, while the U.S. Treasury bills are still the world's safest assets.

**Carpenter, Cameron** "Cinema Is Good Television: How Marvel Studios Changed Our Perception Of Blockbusters Forever" (Jerod Hollyfield)
Film studios are set with a dilemma when it comes to summer movie hits: all want franchises that could potentially run forever and simultaneously bring in tons of revenue. Marvel Studios, with their new take on multi-property collaboration between blockbuster movies, has ultimately changed the way audiences and studios perceive big-budget film. The goal of my paper is to identify the means in which Marvel Studios has found success, while also highlighting the negative effect and burden it has placed on competitive studios in an already superbly competitive market. This, of course, is done through a series of trend and marketing studies up to this point, as well as an analysis of what makes Marvel so fundamentally successful in regards to characters, brand name, and genre expansion.

**Carpenter, George** "Playing With Reality: An Aesthetic And Thematic Exploration Of How Scott Pilgrim Vs. The World Interprets Reality" (Jerod Hollyfield)
In a world dominated by electronic communication, virtual representation, and constant technological development the definition of reality is ever changing. Nowhere is this existential crisis seen more clearly than in the world of cinema. Fantastic worlds are brought to vibrant life as CGI effects and motion capture technology becomes more and more advance. As film critic James Hoberman argues in his book Film After Film even real events, such as the Opening Ceremony of Beijing Olympics, bring images typically trapped in the on-screen world into reality. Edgar Wright's film Scott Pilgrim vs. The World surges into this discussion by meshing the video game world with actuality. Through an episodic narrative, vibrant special effects, comic-book style dialogue, and a digitized soundtrack Wright's Scott Pilgrim effectively blurs the line between what is real and what is invented.

**Carpenter, George** "Where's Jonesville? How The Destruction Of Jonesville Left A Legacy Of Housing Discrimination In Bowling Green, Kentucky" (Patricia Minter)
Jonesville, a small African-American community that existed in Bowling Green, KY, was a tight knit community with a unique cultural identity. Family-oriented and extremely self-sufficient, Jonesville thrived as a prime example of southern black culture in the mid 20th century. However, Jonesville did not stand a chance placed against a powerful local institution. In the late 1950s and early 1960s the Jonesville community was destroyed to compensate for an expanding Western Kentucky University. Targeted by the entirely unjust Kentucky Project R-31, a piece of Urban Renewal legislation, Jonesville was wiped from the Bowling Green map. Because of this locally sanctioned discriminatory action, the displaced citizens of Jonesville were forced into certain areas of town, including Shake Rag, prolonging the problem of residential discrimination past its legal lifespan.

**Carter, Shayla; Neal, Sarah; Pippin, Morgan; Hill, Taylor; Carter, Shayla;** "Effects of Token Economies for Children with Special Needs" (Wanda Chandler)
This literature review explored the components of a token economy system and the benefits it may hold for children with special needs. The instructor can modify a token economy system according to a child's academic or behavioral targets. Tangible or edible reinforcers should be varied and chosen based on consideration of the student's needs and preferences.

**Carver, aaron; Zhang, Rui; Chen, Tse-Hong;** "Synthesis And Catalytic Studies Of Iron(iii) Corrole Towards Selective Oxidation Of Organic Sulfides" (Rui Zhang)
The selective oxidation of sulfides to sulfoxides (sulfoxidation) is of great importance in organic synthesis. Organic sulfoxides are valuable synthetic reagents for the production of a variety of chemically and biologically significant molecules. According to known literature methods, the 5,10,15-tris(pentafluorophenyl) corrole and its iron (III) complex have been successfully synthesized and spectroscopically characterized. In this work, the potential of iron (III) corroles as oxidation catalyst toward selective sulfoxidation reactions has been explored with iodobenzene diacetate, i.e. [PhI(OAc)2], as oxygen source. Under optimized conditions, the iron (III) corrole complex catalyzes the oxidations of sulfides to sulfoxides with high efficiency. A significant water effect on catalytic sulfoxidations was also observed.

**Cave, Justin; Pope, Mollie; Celestian, Aaron; Cole, Jennifer;** "Mineralogy Of Terrigenous Marine Sediment From Cores Off Nw Africa Using Quantitative X-ray Diffraction Methods" (Aaron Celestian)
We quantitatively determined the mineralogy of clay-sized (< 2 μm) terrigenous marine sediments from coretops from the R / V Oceanus OC437-7 cruise along Northwest Africa. A variety of quantification techniques were evaluated, and the LeBail and Rietveld non-linear least square refinement provided the most precise estimation. Samples were chemically treated to eliminate carbonate and Fe-Mn oxide

phases and then prepared for XRD analysis as oriented peel mounts on glass slides to maximize preferred orientation of the clay crystallites. The mineral abundances in the terrigenous clay-sized fraction coupled with geochemical and isotopic measurements will help in further studying modern and paleo-climate conditions in the Saharan region.

**Chavda, Fenil** "A Single Step Synthesis And Characterization Of Nanowires & Nanospheres For Catalytic Applications" (Dr.Rajalingam Dakshinamurthy)
Nanoparticles have gained an immense interest due to its potency for a wide range of applications. Metals have been extensively used for catalytic reduction of p-nitrophenol in presence of NaBH4. p-Nitrophenol is an environmental and biological toxic agent which is widely used in industries for a variety of purposes. Here, we report a single step, biofriendly synthesis of gold nanoparticles (AuNPs) with the help of a fluorescent dye called rhodamine-6G. The synthesized gold nanostructures were characterized using transmission electron microscope (TEM), scanning electron microscope (SEM) and UV-Vis spectroscopy which proved the formation of rhodamine-6G containing gold nanostructures. Catalytic activity in reducing p-nitrophenol to p-aminophenol was assessed and compared for similar concentration of rhodamine-6G gold nanowires and nanospheres using UV-Vis spectroscopy. Finally, using the spectroscopic data, rate constant (k) was calculated and compared for individual nanostructure.

**Cheeseman, Jacob; Pyles, Jessica; Baxter, Michael W.; Thomason, Kelsey E.; Calloway, Autum B.;** "The Effect Of Age Upon The Perception Of 3-d Shape From Motion" (J. Farley Norman)
Our previous research has demonstrated a negative effect of age upon the ability to discriminate the 3-D shape of curved surfaces defined by optical motion. Compared to younger adults, older adults required a much higher degree of temporal correspondence to reliably perform the task. In the current experiment, our previous results were replicated; however, we also assessed speed and grating orientation discrimination. Edden et al. (2009) demonstrated that grating orientation discrimination correlates with GABA concentration in visual cortex. Our current results demonstrate that the negative effect of age upon 3-D shape perception from motion is not caused by impairments in perceiving motion per se, but does correlate with grating orientation discrimination, suggesting that the effect is related to decline in GABA cortical concentration.

**Chityala, Pavan Kumar; Khouryieh, Hanna; Williams, Kevin;** "Effect Of Xanthan-Guar Synergism On The Stability Of Oil-In-Water Emulsions" (Hanna Khouryieh)
The purpose of this study was to investigate the effects of xanthan(XG)/guar (GG)gum mixtures on the stability of 2% WPI stabilized oil-in-water emulsions containing 20% (v/v) fish oil. Emulsions were prepared with 0, 0.05, 0.1, 0.15, 0.2 and 0.3wt % of xanthan and guar gums and the creaming index and viscosity were measured. The apparent viscosity of the emulsions containing XG/GG mixtures was significantly higher than the emulsions containing either XG or GG alone. Guar gum showed the greatest phase separation, followed by XG. The results revealed that emulsions containing XG/GG mixtures had better creaming stability than emulsions containing either XG or GG alone.

**Chrysler, Joshua** "'Pass the Word': Utilizing Kentucky's Oral History Archives" (Michael Ann Williams)
In our 2013 Cultural Conservation course we created NPR style radio pieces by selecting and editing oral history interviews relevant to central Kentucky. We utilized Pass the Word, a searchable oral history database and an offshoot of the Kentucky Oral History Commission, to locate these interviews and wrote supplemental scripts for the broadcast pieces. Our radio pieces center on the contributions of two women to the social fabric of the Commonwealth of Kentucky: Deedy Hall, who was instrumental in establishing the South Union Shaker Museum, and Allie Corbin Hixson, the first women to earn a PhD in English from the University of Louisville and an integral leader in Kentucky's women's rights

movement. Our project showcases the ways in which oral history can be implemented as an educational tool, demonstrating the capacity of public and applied folklore to engage the community.

**Cieszko, Alena** "“look With Your Eyes, Not With Your Hands”: Why The Old Adage Is True, And Why You Should Care." (Michael Ann Williams)
Whenever you visited a museum as a child you might have been scolded to “look, don't touch” by a docent. This was neither over-reaction, nor a fear of breakage. This presentation aims to explain the effect that skin contact can have on certain types of objects, both once or over a long term. There will be examples from all over the world, in cloth, bronze, silver, glass, and more. The aim is to explain what happens to a museum object, physically and chemically, and the challenges faced in reversing the damage. There will also be a short introduction into the field of Museum Conservation, and the steps museums are taking to satisfy the tactile urge without harming their art. Information will be sourced from museum websites, forensics books, and conservation reports.

**CINAR, SELAHITTIN; KHENNER, MIKHAIL;** "Analysis Of A Solid Film Stability In The Horizontal Electric Field" (MIKHAIL KHENNER)
A PDE-based model combining surface electromigration and wetting is developed for the analysis of the morphological instability of a single-component, mono-crystalline solid films in a high-temperature environment typical to a manufacturing process. The adatom mobility and surface energy of such films are anisotropic, and the model accounts for these material properties. The goal of modeling is to describe and understand the time-evolution of the shape of film surface. I will present the formulation of a nonlinear parabolic PDE problem for the height function h(x,t) of the film in the horizontal electric field, followed by the results of the linear stability analyses and omputations of fully nonlinear evolution equation.

**Clark, Caitlyn** "Infrared Platform For Visualization Of Air Flow" (Robert Choate)
Because air is transparent in the IR spectrum, it cannot be imaged directly. This being the case, an intermediate system must be created in order to capture air flow. For this project, Halton Company requested, while working with the Mechanical Engineering Department, for the designing, building, and testing of a simple and easy to use IR platform. The platform will be used to create an image of the air flow produced while operating their ventilation systems. The platform must include a target, which will have a high emissivity and a low thermal inertia, in which the air flow will strike. As a way of testing the system, an air flow bench will be made which will allow for a controlled volume flow rate and a temperature difference to be obtained. Air velocity and pressure will be calculated and correspond with each thermal image obtained.

**Clause, Nate; Schugart, Richard;** "A Numerical Solution Of An Application Of A Linear Optimal Control Problem To A Bacteria Infection In A Wound Using Oxygen Therapy" (Richard Schugart)
The goal of this research is to optimize treatment strategies of chronic wounds using oxygen therapy. We use a differential equation model relating the levels of oxygen, neutrophils, and bacteria in the wound, which are our state equations. We use optimal control theory by minimizing an objective functional containing the bacteria levels and the application of topical therapy oxygen, which is our control. Mathematically, this creates a linear control which provides a bang-bang solution, that can be a discontinuous function. We approximate this with a continuous function and apply the steepest descent algorithm to numerically solve the problem. Convergence was met by setting consecutive changes in the objective functional to be less than a certain tolerance.

**Coates, Samantha** "White Space: An Overlooked Element Of Design" (Kelley Coppinger)
There are many different elements used to enhance visual appeal in Advertising and Graphic design. The

use of space may be thought of as the singular, most important element of design because without it, none but the exception of color can occur. In other words, how things are arranged contributes to how effective an advertisement is to its audience. However, while space is important, it is also vastly taken for granted, specifically in the form of "white space." White space has numerous names and definitions, and can be applied as a design tool in many ways adding function as well as elegance to an advertisement. By analyzing current and past ads that use ample amounts of white space, as well as creating my own ads and putting them to the test, my intended outcome will be to prove white space as an essential tool to advertising design.

**Coffey, Brandon; Kerr, Leigh; Pitts, Courtney; Deng, Jason; Murray, Marion; Mienaltowski, Andrew;** "The Impact Of Speeded Preconscious Emotion Processing On Spatiotemporal Vision" (Andrew Mienaltowski)
When a threat is detected, our focus shifts to locate it. The amygdala drives this shift in focus, which then impacts spatiotemporal vision. Specifically, fearful stimuli improve fast temporal vision at the expense of fine-grained spatial vision. We presented participants with fearful and neutral faces milliseconds before a gap detection task. Participants indicated when they noticed either a spatial or a temporal gap on a given trial. The faces were meant to enhance or disrupt gap detection and were presented so fast that they were not consciously registered in time for the gap judgment. Participants demonstrated a differential response in their gap judgments given the emotion on the preceding facial cues, as the amygdala's response to fearful faces caused people to miss spatial gaps based but notice timing-based gaps.

**Conger, Christopher** "Temporal Or Atemporal Eternity: Two Parts Of The Eternal Trinity" (Alison Langdon)
In The Consolation of Philosophy, Boethius describes eternity as "the complete, simultaneous and perfect possession of everlasting life" (132). As several modern day scholars have noted, this statement is contradictory to religious interpretations of what it means to be eternal. To be everlasting, God may only exist in the atemporal plane, which has no time constraints. Any interaction by God in the temporal plane would negate his everlasting existence by implementing beginning and ending points. This paper presents examples of atemporal and temporal eternity and how they impact God's ability to be omniscient and omnipotent. It also argues for a quasi-temporal eternity (QTE), which Boethius' writings necessitate. The opposing definitions of eternity indicate that God can only exist eternally, and act, if there is a third component available. Only within a QTE is God able to act inside the confines of time while being present everywhere and all at once.

**Conner, Hannah; Applegate, Darlene;** "Bioarchaeological Analysis of Human Skeletal Remains from Sites 15Wa399 And 15Wa916, Warren County, Kentucky" (Darlene Applegate)
Site 15Wa399 is a rockshelter near Shanty Hollow Lake and Site 15Wa916 is an open habitation on Barren River near Bowling Green. Burial 1 at Site 15Wa399 contained at least three individuals: an adult male, an adult of indeterminate sex, and a subadult male. Burial 1 at 15Wa916, an Early Woodland site with an uncalibrated date of 910 BC, contained two adults of indeterminate sex; a 10-month infant was interred in Burial 2. The overall health of the burial populations was good, though the adult male from 15Wa399 exhibited osteoarthritis and the infant from 15Wa916 exhibited extreme periostitis. The robust nature of the adult remains at both sites suggests rigorous physical activity, perhaps associated with food collecting. Taphonomic alterations indicate the mortuary program at both sites involved primary interment.

**Cook, Christopher; Wichman, Aaron; Hippler, Jenny; McFarland, Sam;** "Ease Of Retrieval Does Not Explain The Relationship Between Identification With All Humanity And Human Rights Choices" (Aaron Wichman)

Identification with all humanity (IWAH; McFarland, Webb, & Brown, 2012) is a measure of personality that assesses the extent to which people see all of humanity as their ingroup. Our goals were to test the extent to which guided recall of IWAH experiences, in an ease of retrieval experimental paradigm, might predict scores on the IWAH. We further examined whether recall amount and difficulty could explain the effects of IWAH on a measure of human rights valuing. Results show that although recall and recall difficulty do predict IWAH, they do not account for the relationship between IWAH and human rights choices. This indicates that the underlying nature of the IWAH construct is stable against certain temporary influences on IWAH scale scores, and is consistent with the notion of IWAH as a chronic social identity.

**Cook, Rachel; King, Rodney; Rinehart, Claire;** "Discovery And Analysis Of Mycobacteriophages Cookland And Enyo" (Rodney King)
Bacteriophages are an incredibly abundant group of viruses that exclusively infect bacteria. With over 10^31 phages in existence, they are the most prevalent biological entities on the planet. The Genome Discovery and Exploration Program contributes to the collective knowledge on bacteriophage diversity by characterizing new phages that may have potential bio-medical applications. We isolated and characterized bacteriophages from soil samples obtained in Perryville and London, KY using Mycobacterium smegmatis, a close relative of the bacterium responsible for tuberculosis, as a host. We performed restriction analysis and gel electrophoresis to determine genomic relatedness and we used electron microscopy to visualize the morphology of individual phage particles. Our results suggest that our phages, named Cookland and Enyo, are unique.

**Cooper, Cory; Cooper, Cory; Carroll, Hannah; Roberts, Janina; , Dylan Sherman;** "Behavioral Contracts" (Wanda Chandler)
A literature review was conducted to explore how behavioral contracts work and to study their effectiveness. A behavioral contract is a mutual contract between a student, his/her guardians, and/or school staff. The purpose of this poster was to outline the components of a behavior contract, and to explain how to create one that is effective.

**Corum, John** "Expanding The Critical Space: Emerging Works As Postcolonial Literature" (Jerod Hollyfield)
Implementation of postcolonial criticism is limited to literary works written during the colonial period, but the attention of literary critics overlooks colonial literature composed in the modern era. This paper seeks to devote further analysis to the potential for using postcolonial criticism on these modern works by comparing traditional notions of the period of colonialism to the modern era. By establishing the viability of Postcolonialism's application to the modern work Mornings in Jenin, this paper hopes to affirm the continued value of the critical theory to works of all time periods. The conclusion of this paper suggests that colonization still occurs in the modern era and within the modern era's texts, and thus, Postcolonialism's applicability remains open to these modern works, indicating an expanded utility of the criticism.

**Cotton, Daniel** "Engineering A Frame" (Ron Rizzo)
Construction of a Research Test Frame The Engineering-Manufacturing-Commercialization Center (EMCC) staff and students supported a research project being conducted by faculty and students in the Architectural Program in the WKU AMS Department. The center project was defined as designing and constructing a frame that required a 56in cube construction from 2 in angle iron. This frame was filled with 6 inches of foam on all sides to create a somewhat isolated environment, as well as a potential 500 lbs load on one side of the cube. The frame was constructed using welding techniques. The design of this frame is an important component in the support of a new research initiative.

**Daugherty, Martin; Mullinax, Clint;** "Real Time Speed Sensorless Estimation Of Induction Motor Drives" (Farhad Ashrafzadeh)
The purpose of the project is to eliminate the physical speed sensor through the development of a speed estimator for induction motor drives. Physical sensors are costly and they have reliability issues and are susceptible to environmental variations such as temperature, humidity, and vibration. The speed estimator estimates motor speed through solving a set of differential equations governing the dynamics of the motor in real time. The estimator inputs are normally motor terminal variables such as voltages and currents whose measurements are really inexpensive and highly reliable. The plan is to extend the development of the speed estimator from DC motors to AC motors using a simulation environment called Simulink. The targeted tolerance for the estimator is 10% under various conditions.

**Dawood, Abdulhameed; Jahan, Muhammad; Arbuckle, Greg;** "A Comparative Study Of Conventional And Sustainable Machining Of Titanium Alloy" (Muhammad Jahan)
Titanium and its alloys (Ti-6Al-4V) are widely used in aerospace industries due to their lightweight, high specific strength, and corrosion resistance. This study aims to conduct a comparative experimental analysis of the machinability of Ti-6Al-4V for conventional flood coolant machining and sustainable dry machining. The effect of cutting speed, feed rate and depth of cut on machining performance has been evaluated for both conditions. The machining time and surface roughness were found to be lower in dry machining compared to flood coolant machining. The tool wear was found to be unpredictable, and no significant difference was observed for dry and coolant machining. Comparing all the parameters, sustainable dry machining was found to provide better performance in machining Ti-6Al-4V.

**Dawood, Abdulhameed** "Using Cloud Computing to Reduce the Cost and Improve the Service in Project Management" (Dr. Ahmed Khalafallah)
Cloud Computing defines the pathways ahead in computer science world. Being built on years of research, it utilizes all recent achievements in virtualization, computing design, computing service, and networking. It suggests a service-oriented building through present software and platforms as services, reduces information technology overhead for the costumer, offers more flexibility, facilitates on-demand services, reduces the total cost of ownership, among other benefits. This study investigates developing new servers with cloud technology, and using the cloud storage not only to store information, but also to install the operation system in the cloud. The study also presents the challenges ahead and the possible applications of the new cloud computing technology.

**Day, Robert; Seidler, Tessa; Lile, Cameron; Schroeder, Amber;** "The Writing On The Wall: Facebook Content Predicts Job Performance" (Amber Schroeder)
Whereas nearly one seventh of the people on the planet have a Facebook account (Facebook Inc, 2013), research on the use of social media sites in employment settings is lacking. The current study is one of the first studies examining the link between social media page content and employee job performance. Participants completed a self-report performance appraisal and provided the research team with access to their Facebook profile. Supervisor-provided performance appraisal ratings were also collected. Results indicated that social media profile content such as number of Facebook friends, wall posts, and content present in photos was predictive of job performance. These findings suggest that organizations may benefit from integrating social media as part of current selection systems.

**de Sousa, Bruno Jonatan; Nascimento, Louise Caroline Fernandes Maia;** "Analysis Of The Chemical Composition And Photographic Record Of Typical Food Of Natal-rn" (Karen Mason)
One of the difficulties encountered by food professionals is a lack of data regarding the composition of regional foods. The aim of this research was to conduct chemical analysis and create a photographic record of the following typical foods from Natal, RN, Brazil: wet tapioca crepe with coconut milk (WTCM); filled tapioca crepe with coconut milk (FTCM); filled tapioca crepe with grated coconut

(FTGC); and stuffed pie with dried meat and cassava root (SMC). These foods were prepared and analyzed for moisture, minerals, and macronutrients. The energy value for 100g of WTCM was the lowest (168 kcal), while FTCM (229 kcal) and FTGC (249 kcal) were higher due to their fillings. The results for the SMC revealed a total of 170 kcal/100g. These findings are important for food security, and the data are useful to support nutritional counseling.

**Deacon, Forrest** "The Third Sex: The Objectification And Mythification Of The Gender-nonconformist" (Grace Hunt)
In Existentialist Philosophy, two modalities of human consciousness exist: facticity (sex, past, race, et cetera) and transcendence (the freedom to shape existence). Certain individuals, though, are denied their transcendence and are trapped in rigid gender-roles. In this essay, I will argue that Gender-nonconformists, individuals who refuse to accept social gender-roles, are defined only by their facticity. First, I will utilize Simone de Beauvoir's The Second Sex to argue that the Feminine Existence is limited to its socially-prescribed gender-role and denied transcendence. Secondly, I will utilize The Second Sex to demonstrate that the Masculine and Feminine Existence are not fixed natures, but are socially-imposed gender-scripts. Thirdly, I plan to demonstrate that the Gender-nonconformist is limited only to its expected gender-role. Using these arguments, I seek to prove that the objectification of the Gender-nonconformist violates the double-modality of existence.

**Deckard, Lucas; Hoover, Don; Arnett, Scott; Esslinger, Keri;** "Motor Behavior For The Youth Basketball Coach: Scientific Review And Practical Application" (Don Hoover)
Background: Motor control, learning, and development are important topics for coaches working with youth athletes. When coaches do not integrate these areas of study, they may be more apt to create practice plans that fail to consider the innate physiological and psychological differences between youth and adult participants and lessen the development of sport-specific skills. Purpose: The aims of this literature review and synthesis were to explore recent scientific literature for articles linking motor behavior to application in youth basketball. Methods: A search of electronic databases was conducted for peer-reviewed articles on motor behavior and youth sports. Discussion: Major themes were identified in motor behavior literature and summarized in a manner that might be of use to coaches working with youth basketball teams.

**Delk, Jacob** "A Red Shadow Around Every Corner: Reflections Of Cultural Paranoia In 1950s Science Fiction Films" (Jennifer Hanley)
Science fiction films became popular in the United States in the 1950s. Underlying the idyllic perception of an affluent America, was a public afraid of Soviet expansion and new advances in nuclear technology. Using a variety of sources, including six popular films from the era, this essay analyzes how popular science fiction movies capitalized on public fears of Communism to infuse their tales with spine-tingling psychological terror. Ultimately, these movies provide an important commentary on cultural anxieties about the looming red menace hanging over Cold War America. Because of the societal preoccupation with all things technological and "alien," science fiction films became popular. For historians these films help illustrate that the idyllic picture of the 1950s was, in reality, science fiction.

**Derham, Kelly; Henley, Michelle; Schulte, Bruce;** "African Elephant (loxodonta Africana) Impact To Marula (sclerocarya Birrea), Knobthorn (acacia Nigrescens), And False Marula (lannea Schweinfurti) In The Associated Private Nature Reserves, South Africa." (Bruce Schulte)
In confined areas, high elephant densities are known to have potentially negative impacts on large trees. Because of this, recent increases of elephants in the Associated Private Nature Reserves (APNR) have caused concern. Our objective was to assess elephant impact on three species of trees in the APNR. In addition, we implemented a strategy to reduce elephant impact to trees by wrapping protective wire

netting around the trunk. 2,677 marula, knobthorn, and false marula were assessed for elephant impact in the APNR, 1389 of which had previously been wrapped in wire netting. Wire netting reduced the number of trees that were bark stripped, specifically for marula and knobthorn species. As habitat overlap between elephants and humans continues to increase, wire netting is a means to alleviate elephant bark stripping.

**Deshpande, Ajit** "Comparison Of Antibacterial Effects Between Biologically And Chemically Synthesized Silver Nanoparticles" (Shivendra Sahi)
While the chemical synthesis of nanoparticles is standard, biological synthesis offers a more environmentally friendly alternative. This experiment analyzed the inhibition of bacterial growth when cultures were treated with biologically-synthesized silver nanoparticles (AgNPs) that were created using yucca extract as a reducing agent compared to chemically-synthesized AgNPs that were purchased commercially. The antibacterial effects were analyzed by treating Staphylococcus aureus and Escherichia coli with varying concentrations of AgNPs. The inhibition of growth was tested with disk diffusion method, then by analyzing the growth curve analysis of the microbes treated with AgNPs. The results showed that the biologically synthesized AgNPs had a significantly more potent antibacterial effect than their chemically synthesized counterparts.

**Devine, Steven** "Petrographic Controls on Cavernous Porosity in the Haney Limestone" (Michael May)
South-central Kentucky is a classic example of a mature karst terrain. This region possesses large cave systems due to dissolution within thick beds of host Mississippian limestone. There are several variables that control the development of caves (e.g., chemical, hydrologic, climatological, and petrographic, etc.). In karst systems study of all of these variables is crucial in understanding karst topography and also in understanding cave systems as a special type of secondary porosity generated in carbonate rocks. This research focuses on identifying petrographic variables that influence or control cave-passage development. After identifying macroscopic features (e.g., gross lithology, jointing, etc.) and mesoscopic features (visible in hand sample), it is evident that study of microscopic features (visible in petrographic thin-section or with lab analysis) is a requisite. Study of the microscopic features provides a rarely studied perspective of the details of cave development.

**Dierken, Maxwell** "Development Of Geant4 Model For Rotating Modulating Collimator Based Imaging" (Ivan Novikov)
Wilson's disease is a condition in which copper builds up in the liver, causing malfunction and various neurological disorders. The goal of the project is to design a system to obtain a spatial distribution of elements of interest in vivo. The Rotating Modulating Collimator technique is a well-established method of obtaining a spatial distribution of X-ray and gamma ray sources. We propose to use a similar approach to identify element concentrations in vivo. To design the system and to optimize its performance, a "Monte-Carlo" nuclear simulation should be conducted. The Geant4 software allows researchers to perform simulations with a variety of configurations. The software has been installed and tested for functionality at the API computational facility. Here we discuss the current status of the project and its future development.

**Difani, Ryan** "Real-time Field Analysis Of The 28 May 2013 Mile Wide Ef-3 Tornado Near Bennington, KS" (Joshua Durkee)
On 28 May 2013, an hour-long quasi-stationary EF-3 tornado touched down near Bennington, KS. The WKU Field Methods in Weather Analysis and Forecasting class set out to forecast and document the event as it unfolded. The data used in this real-time forecast analysis included high-resolution mesoscale atmospheric models,automated surface observation network, visible satellite imagery, and level II radar data. These data, along with photography and North American Regional Reanalysis data were used in

this study. Overall, this event was derived from a balance of favorable upper-atmospheric winds and strong atmospheric instability conducive to organized rotating thunderstorms. However, the key initiator stemmed from the intersection of leftover cool air from early morning thunderstorms along a stalled surface warm frontal boundary.

**Doctrow, Jamie** "Community Based Research In Bowling Green" (Elizabeth Gish)
What is the state of the city of Bowling Green and how can we build on our strengths and address our challenges? This presentation discusses presenters' community-based research in Bowling Green together with literature and research about what makes communities strong and democracies thrive. Careful listening and participant observation in Bowling Green reveals a strong network of resources, citizens, and organizations that are working to build on Bowling Green's strengths and address the city's challenges so that citizens can have more of a say about their own lives and community. Yet, at the same time, there remain important areas where citizens, institutions, and government can better collaborate. Through research on promising democratic and community practices in other communities, we are able to offer some suggestions and reflections

**Doostmehraban, Zahra** "Selecting Effective Project Delivery Systems for Successful Project Management" (ahmed khalafallah)
Successful project management involves a number of phases, including getting a lead, turning the lead into a prospect, working towards the sale, closing the sale, and then making the magic happen - delivering. In order to successfully deliver new services/products, developing enterprises need to anticipate market demands, hire skilled staff, and plan well for delivery production problems. Even those initiatives with strict project management and onsite discipline can be negatively affected by project delivery problems. The main goal of this study is to study and evaluate the effectiveness of various strategies, including contractual arrangements and compensation methods, on Design-Build, Design-Bid-Build, and Construction Management at Risk delivery systems. This should prove useful to project managers as they strive to deliver each project, satisfying the constraints of cost, time, and quality.

**Doss, Holly; Tabor, Becky;** "Factors Involved In Optimal Oral Health In A Non-fluoridated Community" (Lynn Austin)
Factors Involved in Optimal Oral Health in a Non-Fluoridated Community Holly Doss Abstract According to the Centers for Disease Control, dental caries is a communicable, multifactorial disease affecting most people in industrialized areas as well as some developing countries (2001). Dental caries remains the most common chronic disease in children ages 6 to 11 and adolescents ages 12 to 19 (2009). Fluoride, a compound supplemented in drinking water and many dental products, reduces the occurrence of dental caries and slows or reverses the progression of existing lesions. Considering the proven benefits of fluoride, it is imperative that communities, especially non-fluoridated areas, and their leaders are thoroughly educated on this issue. An interview session will take place with ten parents of six to eight years olds to gather demographic and background data. The researcher will determine if there are correlations between specific demographic factors.

**Dotson, Katelyn; Ashley, Noah;** "The Effect Of Coragyps Atratus And Cathartes Aura Regurgitation On Escheichia Coli Bacteria" (Noah Ashley)
Vultures eat many different types of carrion, including infected carcasses; yet rarely do vultures ever contract disease. This study investigated the acidity level and antimicrobial properties of the regurgitation of the Black Vulture (Coragyps atratus) and Turkey Vulture (C. aura). We hypothesized that the regurgitation samples would have a low pH and capacity to kill bacteria. Samples were collected from both species of vultures from Liberty Nature Center (Somerset, Ky) and American Eagle

Foundation.(Pigeon Forge, TN), pH was measured and a bacterial killing assay was conducted. As predicted, regurgitations were highly acidic (1.4-1.8) and significantly decreased growth of E. coli colonies. Understanding how vultures alter their digestive secretions will provide insight into their ability to withstand disease.

**Douglas, Breion; Michimi, Akihiko;** "It Must Stop: Dental Cavities Among Young Children" (Gregory Ellis-Griffith)
Dental caries, also known as tooth decay, is the most common oral hygiene disease present in children ages 6-19. Dental caries occur when bacteria from salivary glands produce an acid to breakdown food, and if this acid is not cleaned off teeth it destroys the tooth enamel. The children who reside in the Commonwealth of Kentucky have one of the highest levels of dental caries in the nation. With the use of the Institute for Rural Health data from 2006- 2011,this study examines the data from children (6 to 15 years of age) who sought care through the mobile dental unit. This study will focus on the possible relationship of socioeconomic status (i.e. average income level in household income, insurance status) and access (number of dental providers in a service area) on dental caries status of children.

**Du, Qinchuan** "Employing Project Management Best Practices in Automotive Industry" (Ahmed Khalafallah)
This study aims at identifying best project management practices in order to improve productivity in automotive industry. The study focuses on some critical methods, including Total Quality Management, Business Process Re-engineering, and Six Sigma in order to improve operations and production. In addition, some of the explored concepts include reducing energy consumption, handling work from the beginning, and focusing on the source of the chain of supply. The paper also investigates the value and implementation of lean methods in managing manufacturing of automotives.

**Duck, Kerry** "Effect Of Problem-based Learning On Interest In Mathematics Across Time For High Achieving Students" (Steven Wininger)
This study examined the impact of problem-based learning (PBL) on interest in mathematics across time. Differences between three treatment conditions (two, one, or zero PBL units per semester) were examined across three cohorts (one 5 year and two 4 year). Participants were second through sixth grade students from six elementary schools. Interest in mathematics was measured each spring with a 17-item measure consisting of four-factors. Preliminary results for the five-year data indicated some group differences; however, a general negative trend was observed for three subtypes of interest: emotion, knowledge, and engagement. There was a nonlinear trend for the value subtype. The results suggest interest levels may decline earlier than previously thought. Discussion of group differences and potential moderator variables will be presented.

**Dye, Josh** "Artificial Swim Bladder" (Stacy Wilson)
The focus of this project is to create a product that a scuba diver can use to manually increase their volume of displacement. Doing this will cause a change in the divers density and allow them to bring themselves very close to the same density as the water around them. This state is known as being, “neutrally buoyant.” Once a diver reaches this equilibrium point, they will remain neutrally buoyant at all ranges of depths between 0 and 100 ft. without having to readjust anything. Basically, this device will act as a, “artificial swim bladder” inspired by the air bladder that a fish uses to maintain their level of stability at different depths. A Fuse Grant has been the main source of funding for this project.

**Edge, Adam; Schulte, Bruce; Henley, Michelle; Daday, Jerry;** "Examining Human Perception Of African Elephants (loxodonta Africana) And Large Trees For Insights Into Conservation Of An African Savanna Ecosystem" (Bruce Schulte)

In savanna ecosystems, large trees and elephants have ecological and human value; however, elephants impact large trees, motivating the need for balanced conservation strategies. This study examined the perceptions of tourists and residents towards elephants and large trees. In the APNR, South Africa, a survey was distributed to tourists and residents to determine the perception of humans toward elephants of different age, sex and size, and toward trees impacted to varying degrees by elephants. Both interest groups had similar attractiveness rankings: all elephants and undamaged tree types received high ranks, while damaged trees received average ranks, revealing a conflict of interests. Residents supported more intrusive elephant management methods than tourists. This study reveals the difficulties facing managers in this system.

**Edwards, Jeffry** "Concept Of Space" (Laura Leach)
This research is to increase understanding of space in relation to scale. Space is the three-dimensional realm or expanse in which all material objects are located and our concept of where they are located. Scale (transitive verb definition) is to pattern, make, regulate, or estimate according to some rate of standard. The question raised is how do we understand space though human scale, how we measure things against ourselves, and how can it be applied to architectural design. The product of these studies are through the renovation of the historic MCAS Tustin Hanger. This 300,000 square foot facility has a volume of approximately 15.9 million cubic yards. One does not understand the sheer size in relation to ourselves without a rate of standard. How do we know how immense something is and what significance does that play in architecture.

**Edwards-page, Justin** "3d Pourbaix Diagram" (Gregory Arbuckle)
Our presentation will introduce 2D Pourbaix diagrams by describing their construction and use. We will then outline the challenges of developing the 3D Pourbaix diagram models for magnesium, aluminum and iron. Our goal of developing 3D Pourbaix diagram models was to allow for a better understanding of element stability. Through the application of simulations and animations pertaining to model design and the use of 3D modeling and printing, we fabricated a model that we were able to manipulate.

**Elmore, Whitney; Austin, Lynn; Hulsey, Wendi;** "“ensuring A Healthier Future: Raising Awareness Of Sealants Among Minority Families”" (Lynn Austin)
In today’s society, early childhood caries (ECC) is increasing among traditionally low-risk groups. Furthermore, the prevalence of ECC is greatest among the most disadvantaged groups in society—specifically, racial or ethnic minorities and the poor (American Dental Association). Access to care plays an integral role in that minority groups from a lower socioeconomic status are often less educated and do not have the understanding that non-ethnic people have. Untreated caries can make it difficult for children to speak, eat and sleep; this generally results in a decreased ability to learn and poorer overall quality of life. To complete this project, data are being collected from the Mobile Dental Unit (MDU) of Western Kentucky University. The MDU offers a sealant program to second graders in surrounding counties in the region. Each child completes a background and demographic form with information regarding ethnicity and family history.

**Eovino, Juliana; Morris, Brittany; King, Stephen; Kirsch-Hiltz White, Colleen; West, Havyn; Acree, Jennifer; Simpson, Sarah;** "The Self-defense Law Does Not Apply: Collective Punishment in Sport" (Frederick Grieve)
Collective punishment occurs when one group member is punished for transgressions of another group member. Cushman et al. (2012) found that fans attending baseball games considered retaliatory beaning to be moral. The study used a 2 (situation) x 2 (opponent) x 2 (fandom) between-subjects design. Identification with the Cincinnati Reds baseball team was measured with the Sports Spectator Identification Scale (SSIS); high and low groups were created via median split. Vignettes described a

situation in which a Reds pitcher beaned a player from another team. The situation was manipulated for collective punishment versus spite and rival versus nonrival team. Results of an ANOVA indicated participants in the rival group rated the spite condition as more acceptable than the collective punishment condition and participants in the high identification group reported a higher level of acceptance for behaviors performed against nonrival compared to rival condition.

**Esch, Clarice** "A Native Cyanobacteria, Nostoc, As A Biofertilizer" (Martin Stone)
The native cyanobacteria, Nostoc, is found as free-living colonies on the surface of the ground and fixes atmospheric nitrogen into ammonia, which may be suitable for plant growth. We applied Nostoc and/or a nitrogen-only fertilizer in all combinations (full strength, half strength, control) to the tops of the pots growing corn. After eight weeks both leaf number and leaf height were significantly ($p>0.01$) in the presence of Nostoc alone compared to the control. These data indicate that Nostoc has potential as a sustainable biofertilizer.

**Estes, Lauren; Wininger, Steven; Duck, Kerry; Neblett, Charvinia; O'Grady, Emma; Higginson, Mary Katherine;** "Music As A Performance Enhancer: Does It Work?" (Steven Wininger)
Some races have banned the use of music, classifying it as a performance enhancer. The purpose of the study was to determine whether music can be considered an advantage for exercise performance. This was examined via four experimental conditions: motivational music, enjoyable music, verbal instruction to run faster, and a control. This was a two-part study. In both parts, participants completed a 3-minute step test and a 10-minute bout of exercise on the treadmill at a self-selected pace. During part one all participants exercised without music. Instructions or musical stimuli specific to the assigned experimental condition were used in part two. Distance completed was compared between conditions. Results from two semesters indicate there were no differences in performance across conditions even when controlling for physical fitness.

**Farrar, Mackenzie; Nee, Matthew;** "Quantitative Analysis Of Hormone Concentrations Using An Internal Standard In Surface Enhanced Raman Spectroscopy (sers)" (Matthew Nee)
Surface Enhanced Raman Spectroscopy (SERS) is a powerful analytical tool that measures the vibrational energy levels of molecules in a sample. SERS can be used to identify potentially harmful compounds found in the water supply, such as estrogens, through the use of silver colloid. Varying concentrations of estrogen were adhered to the silver colloid substrate producing a strong Raman signal. However, in order to improve the consistency and accuracy of the results different concentrations of an internal standard, carbon disulfide, are added and tested. Through the use of the internal standard, the concentration of estrogen in a dilute solution can be determined. Ultimately, other potentially harmfully compounds found in the water supply will be able to be studied using SERS, and the concentration of these compounds in solution can be determined through the use of an internal standard.

**Faulk, Heath; Tinker, Darren;** "Redesign And Reliability Testing Of Windage Assembly For Rifle Testing System" (Joel Lenoir)
Reliability in a mechanical system is a primary design characteristic. Design decisions are always made with a view towards improving or maintaining the overall reliability of the final product. The WKU Mechanical Engineering program designed and built a rifle testing system for Remington last year. One subassembly was highly praised for its superior operation relative to the system currently in use. Unfortunately, the subassembly failed after only a short time. This poster documents the forensic review from the mechanical dissection of the subassembly, the design changes made, and the development of a cycling test stand to measure the useful life of the device. This new design will be incorporated into a revised test stand to be delivered to Remington this May.

**Ferguson, John; Lan, Xu; Manda, Venkata Ramana;** "Silsesquioxane Nanostructures For Photovoltaic Devices" (Hemali Rathnayake)
Perylenediimide is an inexpensive organic compound that may be used as an electron acceptor in photovoltaic devices with an electron donor such as poly(3-hexylthiophene). Although the power conversion efficiency of this donor-acceptor system is very low, it can be greatly improved by morphology control. The incorporation of nanostructures into the active layer improves device efficiency by increased surface area between the donor and acceptor and between them and their respective electrodes. Our group has synthesized perylenediimide silsesquioxane nanoparticles, nanorods, nanosheets and nanoribbons to improve the efficiency of this system to potentially become economically viable. Power conversion efficiencies of 2.6% have already be achieved by functionalized nanoparticles in our research group.

**Fields, Christopher** "Functional And Expression Analysis Of A Novel Basement Membrane Degrader In Drosophila Melanogaster" (Ajay Srivastava)
We have been interested in identifying potential genes that promote the process of basement membrane degradation. In this study we present preliminary data with respect to characterization of one such candidate gene. This is a protein coding gene that has several domains associated with zinc ion binding. In an effort to improve our understanding of this gene we have attempted to study the consequence of overexpressing this gene and also inhibiting its function using the UAS-Gal4 system. Overexpression of this gene results in phenotypes at both 18°C and 25°C. Data from selective inhibition of this gene using RNA interference will be presented as well. We have constructed a clone to utilize RNA in-situ hybridization to show expression levels at various stages in the developing Drosophila melanogaster lifecycle.

**Fiorella, Laura** "Time-out Procedures with an Emphasis on Sensory Rooms" (Wanda Chandler)
Multi-sensory Environments (MSEs) are designated areas in a school where students can go to fulfill sensory needs. There are a variety of sensory stimulation techniques within these environments such as visual, auditory, textural, and aromatherapy stimulation. The purpose of this presentation is to inform educators of the benefits of multi-sensory environments (commonly referred to as sensory rooms) in the school setting. Research of the literature included in-depth interviews with teachers who integrated MSEs into their classrooms. Some of the benefits included calming effects, reduced distractibility, behavior state transfer, relaxation, motivation, passive leisure, building trust and relationships, and choice and control. Overall multi-sensory environments are easy to implement, affordable, and beneficial to the success of all students in K-12 school settings.

**Fleischmann, Paul; Shukla, Devesh; Bhaskaran, Sinilal; Krishnamurthy, Sneha; Sahi, Shivendra;** "Study Of Morphophysiological Adaptations In Alfalfa Under High Phosphate Regime." (Shivendra Sahi)
The accumulation of phosphorus in soil due to poor livestock management and prolonged application of chemical fertilizer and animal manures in areas of intensive crop production can cause serious environmental problems. Medicago sativa could potentially be used to accumulate phosphorus to remediate soil, but little information is available in regards to its morphophysiological adaptations in the presence of high phosphorus. The present study provides insight into high phosphorus toxicity in terms of morphophysiological traits of plants. Analyses of different growth parameters and nutrient ionic profiling were completed. At increasing concentrations, root system architecture changed, root to shoot ratio decreased, and iron and zinc uptake decreased. Further investigation of biochemical parameters will be completed as a part of this study.

**Foley, Michelle** "Using Raman Microscopy To Identify Plagioclase Zoning In Chilean Lava Flows" (Andrew Wulff)
Lava flows were collected from the steeply incised walls of the Casitas shield region of the Descabezado Grande-Cerro Azul volcanic complex in the Chilean Andes. Major and trace element geochemistry, mineral compositions and textures were analyzed to determine petrogenetic processes responsible for the range in erupted products. Electron Microprobe (EPM) analyses were collected from feldspars of two samples, and plagioclase compositional ranges include An65-85 in CDCN-8M and An66-89 in CSN-33. Analyses were also collected using the Raman microscope. In this study, the same (EMP) points on the feldspars were analyzed using the Raman microscope. EMP compositional data and Raman spectral data were used to construct a calibration curve that can be used to provide more accurate results on the Raman microscope for plagioclase feldspars.

**Ford, Anthony** "Sustained Energy Reductions In Buildings Through Informed Consumer Decision Making" (Keith Sylvester)
Consumer energy use is directly related to awareness of daily electric energy consumption. The goal of this research is to improve home energy reduction by informing occupants of the effects their habits have on energy usage. This research purports that the hourly and daily modification of occupant behavior leads to effective and viable energy sustaining practices. A method for monitoring electric energy via a device installed at the meter and hard wired to an interior panel display is discussed. The display communicates instant, hourly, and daily energy usage. This interactive link between consumers and their energy consumption will lead to fundamental changes in their behaviors, creating a more sustainable, energy-conscious society.

**Fortney, Casey; Redifer, Jenni;** "Self-explanation And Retrieval Practice Improve Recall And Inference Test Performance" (Jenni Redifer)
Students who use practice retrieval as a study strategy perform better on recall tests than students who only reread their subject materials (Roediger & Karpicke, 2006). The literature is inconclusive on the effectiveness of the self-explanation study method, in which students explain to themselves the concepts contained in course materials (Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013). This study compared these three study methods (rereading, retrieval practice, and self-explanation), making use of materials and methods from Roediger and Karpicke. Preliminary results suggest that participants who used self-explanation performed better on recall tests than participants who used practice retrieval and those who reread the material. The results of this study may have implications for both students and instructors in the classroom.

**Fox, Sarah** "Dare To Care: A Study In Socially Active Leadership" (Tracy Inman)
This thesis details the creation and execution of the class “Dare to Care: A Study in Socially Active Leadership” which was offered through a Saturday enrichment program to gifted middle school students. The class combined the study of leadership skills with the idea of being a change agent—a leader who uses his or her abilities to make a positive difference. Results of a pre- and post- assessment using The Everyday Leadership Skills & Attitude Inventory, as well as a survey, show that leadership studies improve student’s self-awareness of leadership potential, increase student understanding of effective leadership methods, and encourage students to pursue meaningful leadership roles in their fields of interest. Both qualitative and quantitative results are highlighted and student responses to class content are discussed.

**Franks, Callie; Kingery, Thomas;** "Students In Ansc 140 Perceptions On Value, Purpose, And Animal Welfare Of The Modern Rodeo" (Thomas Kingery)
The modern rodeo serves a part in the entertainment industry. The rodeo world has grown larger in

audience appeal. With this comes plenty of misunderstanding and controversy with the perceptions of the value, the purpose, and the animal welfare of the modern rodeo. This survey was developed to analyze the perceptions of modern day rodeo through the Fall 2013 Animal Science 140 class at Western Kentucky University. The four sections of this survey included demographics, value, purpose, and animal welfare. These four sections were selected so we could find uniformity within the Animal Science class.

**Fulkerson, Laura** "My Experience in Kentucky Clinics and Gale's Point Clinic" (Jeanette Gullett)
In January 2014, 25 WKU faculty and students participated in the Impact Belize program that involved providing medical and health-related services in a community center at Gales Point, Belize. Gales Point is a small village of 500 people located on a peninsula and known for its West Indian Manatees. This presentation compares my experiences shadowing physicians at Gale's Point, Belize compared to previous observations with physicians in Kentucky. While in Kentucky, I had observed many cases of hypertension, asthma and other health conditions. Similar and other cases were observed at Gale's Point, except that these patients received limited or one time medication supply. Notable obstacles to healthcare delivery at Gales Point included poverty, lack of public transportation, and government funding. There is urgent need to provide adequate transportation to Belize City and funding for primary healthcare with a view to improving the health outcomes of the Gales Point community.

**Gallion, Amanda; Wulff, Andrew;** "Karst Landscape: The Relationship Between Social Work Education And Environmental Sustainability" (Simon Funge)
The purpose of this research project was to examine the educational practices of Kentucky-based public school science teachers (grades 4th-8th) regarding how they incorporate education about karst topography and environmental sustainability into their teaching. Data was gathered using interviews. This presentation will highlight the range of strategies science teachers use as well as the factors that may be inhibiting or facilitating this incorporation.

**Garber, Ashton** "The Effects Of Magical Realism" (Sonia Lenk)
Ashton Garber, ashton.garber270@topper.wku.edu Title: The Effects of Magical Realism Subject Area: Social Science and Services Equipment: None Professor: Sonia Lenk, Sonia.lenk@wku.edu This study is an in depth look at how magical realism, a literary genre which reached its peak in Latin America, impacts not only the culture of this region but also the literature in the United States as well as in Europe. The novel, One Hundred Years of Solitude by Gabriel Garcia Marquez, is the main example threaded throughout the essay. By using literary reviews and interviews from other Latin American authors it can be seen how magical realism has evolved over the years to create an impactful form of literature that has spread Latin American culture throughout the world.

**Garmon, William; Wulff, Andrew; Higgins, Barry;** "Fluid Inclusion Investigations Of Burkesville, Ky Ore Deposits" (Andrew Wulff)
The Burkesville deposits are carbonate-hosted sulfide ores within the Knox Dolomite in south-central KY. Observed minerals include dolomite, calcite, sphalerite, pyrite, and quartz. LA-ICP-MS analyses of sphalerite matrix material from Burkesville cores revealed notably different chemistries across visibly zoned crystal regions. The majority of analyzed sphalerite crystals were of a dark orange coloration, containing trace amounts of Cd, Cu, Fe, Pd, Ag, Pb, Al, Mg, Sb, Ge, and Sn. Yellow intergrowth bands revealed elevated levels of Al (~20x), Sn (~100x), Ge (~40x), and Ga (~50x), and the presence of In, while relative Cu levels were depressed. These chemical zones represent distinct primary fluid compositions, mineral growth stages, and specific paragenetic conditions such as fluid chemistry and temperature during ore formation.

**Gatti, Ariele; Schroeder, Amber;** "Incivility Perpetrators ‘r Us: Examining How Personality Predicts Workplace Incivility" (Amber Schroeder)
A collaborative and productive work environment is a major goal that every organization strives to achieve. As such, understanding the antecedents of negative workplace behaviors such as incivility (face-to-face and online) is of interest. The focus of this study was to examine personality as a predictor of incivility perpetration. Employees completed established personality scales and measures of incivility perp. Results indicated that antecedents of incivility may differ across settings, however individuals who engaged in both forms of incivility reported higher levels of CSE, self-esteem, and emotional stability than non-perpetrators. Narcissism was also a strong indicator of both forms of incivility perp. Findings from this study are important and demonstrate that personality can be a strong predictor of incivility.

**Glass, Rachel; Kingery, Thomas;** "Agriculture And Spanish" (Thomas Kingery)
Agriculture in the United States is becoming a diverse field with the incorporation of Hispanic employees. The purpose of this naturalistic qualitative study is to identify agriculture students’ perceptions and knowledge of the Spanish language and Hispanic cultures. The population of Spanish-speaking workers in agriculture is steadily increasing throughout the United States; furthermore, this population brings cultural and language differences that can create barriers among coworkers (Justen, Haynes & VanDerZanden, 2009). Colleges and Universities are determining ways to better prepare agriculture students for the cultural and languages challenges they may face when working with Spanish-speaking coworkers (Boyrs, Ingram, 2008). The researcher will conduct a naturalistic inquiry that would provide qualitative data about agriculture students’ knowledge and perception of the Spanish language and culture.

**Goodman, Brian** "Amounts Of The Blue-light Photoreceptor Plant Cryptochrome In Chlamydomonas Strains That Differ In Their Blue-light Sensitivity" (Sigrid Jacobshagen)
The purpose of this study is to determine the amount of the photoreceptor plant cryptochrome in three different strains of Chlamydomonas that show different sensitivities to blue light when resetting their circadian clocks. The hypothesis is that there is an inverse relationship between cryptochrome amounts and blue light sensitivity in these strains, because cryptochrome is thought to be a photoreceptor that inhibits resetting of the circadian clock upon blue light. Therefore, strains with higher blue light sensitivities are expected to contain lower cryptochrome amounts. The procedure involves growing algae cultures of Chlamydomonas, harvesting them, and extracting all soluble proteins. The amount of cryptochrome will then be analyzed through the technique of western blot analysis. The experiments are still in progress.

**Green, Darin** "Evaluation Of Carbonatites From Gunnison, Co And Magnet Cove, Ar" (Andrew Wulff)
Carbonatites are rare igneous rocks that contain greater than 50 percent primary carbonate minerals, such as calcite, dolomite, and Fe-rich carbonates, and are usually associated with strongly alkalic igneous rocks. Recent investigations of carbonatites have identified them as potential sources of REE. Carbonatite samples were collected from the Iron Hill Complex outside of Gunnison, Colorado and the Magnet Cove, Arkansas area. Samples were crushed, powdered in agate mortar and pestle, and analyzed using XRF, XRD, and ICP-MS to characterize the geochemistry and mineralogy, and to evaluate their potential as REE ores. Iron Hill samples are dolomitic with Nb-Ti accessory minerals, while Magnet Cove samples have more calcite with minor dolomite and Fe oxides. This suggests that Iron Hill represents the best potential for REE exploration.

**Greenwell, Victoria; Lickenbrock, Diane;** "Examining Associations Between Infant Temperament, Parental Competence, And Family Resources And Their Effects On Parental Sensitivity" (Diane Lickenbrock)
A sensitive parent-child relationship is essential in ensuring the healthy mental and physical development of an individual. There are many factors that have an effect on parental sensitivity, such as aspects within the parent (resources, parental competence; Paulesson-Hoogeboom et al., 2007; Jones & Prinz, 2005) as well as aspects within the child (temperament; Rothbart & Bates, 1998). The combination of how these parent and infant factors predict parental sensitivity has not been examined with both mothers and fathers. The current study involves families (mothers, fathers, 4-month infants). Parents completed questionnaires (infant temperament, parental competence; Garstein & Rothbart, 2002; Johnston & Mash, 1989), participated in a demographic interview (resources), as well as a dyadic play task (parental sensitivity; Tronick et al., 1978) with his/her infant. Preliminary results will be reported using the portion of the sample that has participated (n=8).

**Gregory, Adrian; Duck, Kerry;** "Examination Of The Effects Of Previous Competitive Experiences On Task Performance Across Contexts" (Steven Wininger)
Whether or not competition should be used in classrooms is a much debated topic in education. While competition is an inherent part of athletics, the structure and intensity of competition is often debated. The purpose of this study was to examine differences in task performance across contexts between persons with different competitive backgrounds across those contexts. Participants completed self-report measures about their previous experiences in competitive academic and athletic contexts. Next, participants completed performance tasks for mathematical problem solving, verbal reasoning, and handgrip endurance. Incentives were provided via gift cards for top performers and chances to be entered into gift card drawings for reaching set performance criteria. Data collection is on-going. Results and discussion will be presented.

**Grillon, Dustin** "By The Rivers Of Babylon: Diaspora And The Origin Of The Jewish Presence In Rome" (Eric Kondratieff)
This paper explores the fragmentary evidence for the establishment of a Jewish diaspora community in Rome by the early 1st c. BCE. It considers such evidence as: the developing concept of diaspora within Jewish culture itself; the evidence of Hellenistic, Roman and Jewish authors (e.g. Cicero, Valerius Maximus, and the author(s) of Maccabees); and the work of historian Erich Gruen and archaeologist Filippo Coarelli. In sum, this paper aims to establish that Jews had already made a permanent home in Rome well before Pompey the Great brought captive Jews to Rome subsequent to his conquest of Judaea in 63 BCE (the traditional date ascribed to their arrival).

**Gross, Loren; Kingery, Thomas;** "Post-secondary Students Perception Of College Readiness Skills Developed During Secondary Education Careers" (Thomas Kingery)
This study is designed to collect information from participants in the AGRI 175 University Experience Agriculture. The data collected will be focused on the college readiness and career preparedness of students coming from a secondary school system by being broken into the subcategories of: FFA/ 4-H/ Extracurricular, Classroom, Outside of Classroom Educational Obligations, and Miscellaneous. The study will use these four sections as primers for responses for the participants. The four areas will utilize questions to attain attributes in knowledge, skill, and abilities from the subjects with their experiences in secondary education. The Goal of this study is to determine whether one area of secondary education has more effect than others on students post-secondary success or if it is an equal blend of two or more of the subcategories discussed.

**Gruner, Morgan; Williams, Kevin;** "The Reaction Of A Platinum Triamine Complex With Different Dna Protein Complexes" (Kevin Williams)
The platinum compound Et_2 dien [Chloro[N,N-diethyldiethylenetriamine] Platinum (II) Chloride] was synthesized and reacted with N-acetylmethionine (N-AcMet) and guanosine 5'-monophosphate (5'-GMP). Previous data shows that N-AcMet reacts faster with the central platinum atom, while 5'-GMP bonds slower. When Et_2 dien was reacted with N-AcMet the N-AcMet displaced the chloride ion. When 5'-GMP was added the N-AcMet was not displaced as predicted. Through ¬1¬H NMR Spectroscopy and Mass Spectrometry we observed that the 5'-GMP also bonds to the central platinum ion displacing one of the nitrogen atoms of the Et_2 dien chelate. Platinum compounds similar to Et_2 dien, but with varying degrees of bulk surrounding the central molecule, have been reacted with N-AcMet and 5'-GMP yet the formation of an analogous product was not observed.

**Guthrie, Benjamin; Hubbard, Cameron; Harmon, Mitchell; Brown, Andrew; Andrew, Keith; Steinfelds, Eric;** "Representation Of The Stau – Neutralino Feynman Diagram Epsilon Integral As An Analytic Function" (Keith Andrew)
The neutralino is a dark matter candidate arising in the super symmetric extension of the standard model. For the Minimal Supersymmetric Standard Model, MSSM, extension the lightest non-decaying neutral particle is the neutralino. As a relic particle from cosmic production in the early big bang it should be abundant in galactic halos giving rise to anomalous rotation curves. A fraction of the interactions of the neutralinos should annihilate or co-annihilate producing gamma rays that are observable on Earth. The calculation of this branching fraction produces a series of Feynman diagrams that give the cross section and probability for the gamma ray event to occur. Here we look at the diagram given by the Stau slepton interacting with a neutralino in terms of the Feynman integral with a neutral Z boson propagator. We find an analytic expression for one of the cross section terms.

**Hagan, Stephanie; , Dr. Cathleen Webb;** "Paleontological Study Of The Mercury Levels In Bats" (Cathleen Webb)
The first human to enter Mammoth Cave passed under its arch about 4,000 years ago, but bats have been calling it home long before humans discovered it. Due to environmental exposure to mercury, these bats potentially show substantial mercury bioaccumulation. Bats now come into contact with mercury through atmospheric deposition from industrial sources. It is expected that the modern bats residing in Mammoth Cave should have measurable levels of mercury in their system which has been determined by guano analysis. Over fifty current samples of bat guano have been analyzed and exhibit mercury levels at the part per billion level. These results are compared to samples collected from historical guano deposits in Mammoth Cave National Park, which show substantially lower levels. Historical samples have been dated in earlier studies.

**Hall, Jessica** "Analysis Of No And Noy In The Low Atmosphere Of Mammoth Cave National Park" (Matthew Nee)
To better understand nitric oxide (NO) and reactive oxides of nitrogen (NOy) trends in the atmosphere, data from Mammoth Cave National Park (MCNP) are analyzed. NO and NOy are pollutants produced by automobiles and formed naturally from nitrate ions (NO3-). We are interested in the natural processes that produce NO and NOy, not those from anthropogenic sources. The rural location of MCNP allows the natural sources of NO to be studied without anthropogenic sources significantly contributing to the overall levels. NO is correlated with factors such as solar radiance and precipitation. There appears to be a correlation between NO and solar radiance, and nearby cities were not found to be point sources. The concentration of NO3- in wet deposition is compared with NO and NOy to determine the extent nitrate ions enter the atmosphere.

**Hall, Lydia; Sartin, Ashley; Schulte, Bruce;** "Elephant Behavior and Grouping at the Nashville Zoo" (Bruce Schulte)
Elephants in captivity often do not live in family units but rather they are housed with unrelated individuals with which they create family-like bonds over time. At the Nashville Zoo, there are two pairs of elephants; two elephants are long-term residents while the other two were introduced together several years ago. There is indication that the two pairs still act as separate pairs living together and not one social unit. The objective of this study was to examine the social nature of this group of elephants. Through collecting data using focal animal and scan sampling, we have observed limited progress to the elephants functioning as a single social unit. Understanding the behavioral dynamics of the four elephants at the Nashville Zoo could help zoo personnel integrate these pairs into a cohesive social unit.

**Hall, Veronica; Ouellette, Gilman;** "Addressing Water Resource Issues In Barbados From An Isotopic And Atmospheric Characterization Of Precipitation Variability" (Jason Polk)
Climate change induced flooding and drought will alter how humans use water resources in the future. Tropical islands, such as Barbados, are vulnerable to changes in storm frequency and intensity, which effect karst aquifer storage. This study presents an isotopic analysis of Barbados' rainfall and groundwater in relation to atmospheric characteristics to understand how storm systems affect groundwater resources. Over 1.5 years, weekly subsurface and rainfall samples were collected from Harrison's Cave for isotope analysis (O and H). TRMM satellite data was used to identify atmospheric characteristics of classified storms; then related to the isotopic variability of storm events. The data indicates the amount effect dominates the isotope signal of rainfall, and that seasonal variations may play a large role in Caribbean water resources.

**Hamilton, William** "Designing A Unique Therapeutic Agent Involving Gold Nanoparticles Capped With Ceftazidime For Potent Antibacterial Applications" (Rajalingam Dakshinamurthy)
There is a desperate need for making new antibiotics in response to the soaring increase in cases of multi-drug resistant (MDR) bacteria which are prevalently known as "Superbugs". We designed an effective antibacterial agent involving gold nanoparticles (AuNPs) capped with an antibiotic.By keeping twelve principles of 'green chemistry' in mind, an unique, single step process, unlike conventional methods was fabricated for making AuNPs using the combine reducing and capping ability of ceftazidime to yield ceftazidime capped gold nanoparticles which were then characterized using TEM, SEM and UV-Vis spectroscopy to determine its morphology. Efficiency of Cef-AuNPs was assessed using several antibacterial assays such as bacterial growth assay, spread plate method and XTT assay. The MIC of Cef-AuNPs was compared with pure ceftazidime drug.

**Hampton, Victoria; Mahmood, Rezaul;** "An Analysis Of The Temperature Differences Between Metcalfe And Cumberland County Mesonet Observations" (Rezaul Mahmood)
Metcalfe and Cumberland Counties are located next to each other in the south-central Kentucky region. Both counties are home of Kentucky Mesonet weather and climate observing stations. They are located approximately 28 miles apart and over slightly different topographic locations. A study was conducted on maximum and minimum temperature observations to determine if there were differences in observed data, and if so, what caused these differences. The temperatures were also analyzed to see how the drought of 2012 potentially impacted the observations. In addition, diurnal temperature ranges, precipitation, and solar radiation, for the two summers of 2012 and 2013 from these two counties were compared to identify causes of temperature differences.

**Hancock, Stacy; Carini, Dr Michael;** "The Mass Of The Central Supermassive Black Hole In The Seyfert Galaxy Ngc 5548" (Michael Carini)
The Seyfert 1 galaxy NGC 5548 is being targeted by an international group of astronomers and

instruments for observations that will enable the determination of the mass of its central supermassive black hole via a technique called reverberation mapping. I will describe this technique and discuss the contributions to this international effort that I am making using the three telescopes that comprise WKU's optical telescope network: the Robotically Controlled Telescope (RCT), the Bell Observatory and the Crimean Astrophysical Observatory.

**Harris, Benjamin** "Catholicism, Aufklärung And The Rise Of Nationalist Sentiment In The Germanies: An Examination Of Maximilian Iii Joseph And Frederick Ii" (Beth Plummer)
This paper offers a case study of the German states of Bavaria and Prussia during the separate reign of two 18th century rulers, Maximilian III Joseph and Frederick II. It examines various policies in regards to foreign policy, the arts, academics and legal reform, showing the similar "enlightened" nature of the two monarchs. However, German national history idolizes one while ignores the other. My paper examines the nature of these reforms and the various factors that cause the glorification of Frederick II on a national scale, while Maximilian III Joseph remains relatively obscure.

**Harris, Douglas; Stuckwisch, Curtis; Nicks, Jacob; Jones, Jordan;** "Creation Of Environmentally Safe Quality Control Device" (Stacy Wilson)
Daicel Safety Systems (DSSA) is a manufacturing facility that produces airbag inflators in Beaver Dam, KY. During the production process, a small number of inflators do not meet the quality control standards and must be disposed of in an environmentally friendly and economically safe manner. Currently, non-standard inflators are disposed of with a heating method. An alternative method is desired because DSSA is constantly improving their entire manufacturing process including quality control and safety. The design team is tasked with researching and prototyping a safe and effective method of triggering non-standard inflators. This new method will help the company continue to satisfy government regulations regarding the safe disposal of the non-standard inflators.

**Harris, Jasmon; Holmes, Samantha; Davis, Trevor;** "Academic Strength of Thematically-Designed International Programs: Phase III of KIIS Tanzania Program" (William Mkanta)
With a vision for international reach, one of the WKU's aspirations is the strengthening of its international programs. Study abroad programs provide a platform for student learning with global perspective; these programs can enrich student learning with carefully designed themes that carry specific meaning tying student's academic needs and personal goals as a global citizen. KIIS Tanzania Program has a focus on public health, in the past three years it has enabled nearly 60 students to experience real life health situations faced by Tanzanian communities based on specific program themes including "AIDS Management" and "Learn and Serve Abroad." In 2014, the theme is "Learn and Research Abroad," where students in the program will participate in pediatric HIV research. The purpose of this study is to demonstrate the impact of thematically-designed programs on enhancing student global learning experiences.

**Harris, Lauren; Kingery, Thomas;** "Post-secondary Agriculture Students Perception Of Chemistry Use" (Thomas Kingery)
Agriculture is a science most people forget about, even the students studying it. Agriculture relies heavily on chemical sciences. Such as, nutrients different plants use to grow the best or how to feed a cow to produce more milk. Both use chemistry. Many agriculture students are not knowledgeable or prepared for their careers due to lack of retention of chemistry concepts & knowledge. A survey was conducted with the research focus being, "Post-Secondary Agriculture Students Perception of the Use of Chemistry in their Careers". This survey was distributed to recent graduates, current seniors, and juniors at Western Kentucky University.

**Hasanovic, Muhamed** "Growing Diversity At Wku" (Leyla Zhuhadar)
Gather Time Series data of International Students at WKU from 2003 to present 2013. This research included: Analysis, interpretation, patterns discovery and chart present the growth and declines of the international interest in studying at WKU. Evident increase of international students coming from China and Saudi Arabia. One of the interesting patterns discovered in this data that we found that the increase of male Saudi Arabia students correlates with the increase of the female Chinese students.

**Hastings, Austin** "A Foundation Built On Brotherhood" (Laura Leach)
The goal in designing a fraternity house for Delta Tau Delta was to create a house that would become a place where members would spend four of the most important years of their lives. It is important to create a space where brothers can come together, united for a common cause; a feature of paramount importance for any fraternity.My research revealed the different styles of fraternity houses and what sustainable aspects go into their design. My research also states that the design of a fraternity house must be flexible enough to accommodate multiple types of functions without interrupting its primary role as a residence. The result of this research led to the development of a fraternity house that leaves a minimal carbon footprint while simultaneously creating a living space.

**Heinstein, Raven** "Visual Tension In Graphic Design" (Kelley Coppinger)
My thesis explores the use of visual tension in various graphic design areas and works. It delves into the purposes of creating visual tension and in which instances it can be most effective, as well as most ineffective. It discusses the use and creation of visual tension with composition and negative and positive space, color, typography, symmetry, and emphasis and dynamics. I have organized it into three main sections: defining visual tension, discussing it's relevance and significance, and showing informative examples. I'm using a combination of primary and secondary research, such as books and interviews or surveys respectively, as well as constructing a few design pieces myself. I hope to show exactly how important visual tension is to good design work when used properly and explain, as well as show, how to best create it.

**Heintzman, Eli** "Raman Scattering And Raman Mapping Of 2d Van Der Waals Solids For Potential Technologies: Going Beyond Graphene" (Sanju Gupta)
Strong in-plane bonding (covalent) and weak van der Waals interplanar interactions characterize a large number of layered solids, as epitomized by graphite. The advent of graphene (Gr), individual atomic 2D layers isolated from mineral graphite using micro-mechanically exfoliation has enabled the ability to pick, place, and stack of arbitrary compositions, which would otherwise be impossible to synthesize using other known techniques. Moreover, this discovery implicated an access to a vast range of materials of all other dimensionalities beyond graphene towards 2D van der Waals solids and artificially stacking atomic layers forming hybrids / superlattices. Here we present Raman spectroscopy and mapping of graphenes, transition metal dichalcogenides (MoS2, WS2), and h-BN systems revealing collective and localized molecular vibrations.

**Helton, Anna** "Exotic Women, Conflicting Allegories: La Paillardise And Savage Identities In The Early Modern French Imagination, 1500-1700" (Beth Plummer)
This paper examines the often contradictory modes in which the early French colonial discourse both allegorized native women in the New World as models of motherhood to be envied by European women, while demonizing them as licentious and sexually perilous sauvages. The role that these contradictory models played in supporting the early French colonizing ideal, constructing gendered boundaries of civility and sauvagerie, and reconciling early modern French national identity to its own “barbaric” past will also be at issue, to determine how Europeans in general used female sexuality to construct a gendered discourse of difference before the development of race theory in the later eighteenth century.

**Hill, Kaycee** "Settling The Score: The Other “other” And Hybridity In The Fugees’ Lyrics" (Jerod Hollyfield)
Blending street consciousness, Haitian sensibilities, and intelligent counter-discursive strategies, The Fugees created one of the most successful rap albums of the 1990s, The Score. Examining the lyrics of this album using both African-American and Postcolonial literary theories in the spirit of Paul Gilroy’s Black Atlantic illuminates differences that led to The Fugees’ success and their influence on American pop culture. A close reading of The Fugees’ songs as poetry exposes their repudiation of violent messages in popular rap music. Juxtaposing The Fugees’ marginal social status with trends in American politics and hip-hop highlights the group’s effort to reshape the Black Aesthetic into a more inclusive ideology.

**Hogg, Karen** "How Many Guitarists Does It Take To Screw In A Lightbulb? - The Folklore Of Musician Jokes" (Michael Ann Williams)
This paper explores musician jokes as a thriving genre of folklore within the musician community. I have collected samples of jokes from a population of approximately 500 musicians. From these samples, I discuss the various categories of jokes, including jokes about specific instruments, jokes about specific instrumentalists, knock-knock jokes, and light bulb jokes. While I examine how jokes can serve as a way to bond members of a folk group together, they can also reinforce hierarchies and attitudes about race and gender within a community. For example, jokes about singers are often directed towards female vocalists and their perceived lack of musical ability. In this respect, jokes function as a window into darker aspects of culture.

**Holgate, Hannah** "Organic Influence" (Laurin Notheisen)
My creative ideas are expressed through the spontaneous use of materials and the resulting organic shapes. Experiments with the natural reactions of solvents with ink in printmaking help to establish the canvas for my intentional mark making. The unexpected results keep me continuously eager to repeat this process. I work to balance color and maintain a strong composition with what might be a difficult or awkward start. Additional colors and lines create directional movements for the viewer. Forms and textures found in nature are inspirations for abstract manipulations. The resulting prints are a communication between the materials, myself and the viewer, who may not be able to separate the spontaneous from the intentional.

**Hollis, Jay** "Perceived Engagement Of In-service Teachers During Traditional And Inquiry-based Lessons" (Lee Ann Smith)
The KY Department of Education is implementing a new system to evaluate the effectiveness of teachers. “Engaging students in learning” is one of the components. This study examines the perceived engagement of teachers during a photosynthesis lesson using traditional and inquiry approaches. The participants, 67 science teachers, completed surveys after each lesson using a Likert-scale to rate engagement. A paired-samples t-test was conducted to compare the engagement of teachers in a traditional and inquiry lesson. There was a significant difference in the survey scores for the inquiry lesson ($M=6.58$, $SD=1.22$) and traditional lesson ($M=2.70$, $SD=1.04$) conditions; $t(9)= 13.57$, $p < 0.00001$. The result is significant at $p \leq 0.05$. One practical implication might be that teachers who practice inquiry-based lessons might score higher in the "engaging students in learning" category.

**Holmes, Chris** "Stalker: Politics And Religion In The Soviet Union" (Jerod Hollyfield)
Film can be used as an outlet for the oppressed to voice their opinion against their oppressor in a very sublime fashion. This notion is very prevalent in the lofty ideas that are at the core of Andrei Tarkovsky’s art film Stalker (1979). Stalker is a prime example of post modernism because it refuses to adhere to traditional film conventions; instead, it denies its audience a complete resolution and it leaves

many questions unanswered, and open to interpretation. Underneath the film's narrative however is a voice that shows disdain for the oppressive Soviet rule. This film is an allegory for the unhappiness of the common citizen living under Soviet rule, and how they long for life outside of the Soviet Union. Using a history of the Soviet Union as a starting point, I'm going to examine how the narrative of Stalker is essentially one director's view on oppression through the use of both political and religious allegories.

**Horan, Kimberly; Desrosiers, Patricia;** "Educational Motivation For Students In Gales Point, Belize" (Patricia Desrosiers)
The purpose of this qualitative research was to evaluate the gender differences and or similarities in student's motivation to attend and attitudes towards school in Gales Point, Belize. When conducting the research, the researchers used convenience sampling of parents in Gales Point, Belize. The participants were asked to fill out an informed consent and then an interview was conducted. Previous research has shown that there is data that suggests the subjective motivation in girls' secondary schooling is due to gender bias (Fye, 2010). The research allowed the investigators to have a closer look into the educational and culture of Gales Point, Belize and the children attending and participating in school. Anderson-Fye, E. (2010). The role of subjective motivation in the girls' secondary schooling: The case of avoidance of abuse in Belize. Harvard Educational Review, 80(2), 174-202.

**Howard, Leslie; Childress, Morgan; Smith, Matthew;** "Visual Prompting for Students with Disabilities" (Wanda Chandler)
This poster describes the results of implementing visual prompting using tangible reinforcements to promote active student engagement in an early elementary classroom setting. Visual prompting can be administered through the use of visual displays to increase the probability that students will give correct responses. This form of prompting can be supported through the use of positive, tangible reinforcements. This research has been compiled to determine the outcomes of application of visual prompting using tangible reinforcements to benefit student participation, comprehension and communication in the classroom. The information was gathered through a literature review using scholarly journals, academic and peer reviewed articles. The results are clarified through evidence-based practices and data collection. Results of the literature review determined that visual supports supplemented verbal instruction by clarifying the information for increased comprehension.

**Hubbard, Cameron; Guthrie, Benjamin; Harmon, Mitchell; Brown, Andrew; Andrew, Keith; Carini, Michael;** "Criticality Point For AGN Jet Structure From Poincare Maps" (Keith Andrew)
Active Galactic Nuclei often give rise to extreme particle jets that are highly energetic and many light years in length. When the jets are from a Quasar and are directed along the line of sight to the observer the resulting object is known as a Blazar. Here we model the Blazar jet as a cylindrical beam of particles extending from the outer black hole region of the Blazar to the decelerating terminal jet plasma. We use the Krivosheyev Blazar Jet Equations that couple the charged particles of the jet to the axial magnetic field of the Blazar to examine the variations in light intensity and total jet stability. We find that the resulting equations exhibit an extreme sensitivity to initial conditions based on the magnetic field strength as seen in Poincare plots. For weak fields the jet is stable and displays a period doubling interaction and for strong fields the jet motions are chaotic resulting in the fracture and decay of the jet.

**Hughes, Bonnie** "Women In Country Music, 1970-2014: An Analysis Of Billboard Trends And Census Data" (Michael Ann Williams)
Music Industry statistics provide a window into the lives of consumers. These statistics can provide valuable insight into communities which select specific narratives at specific times. Narrative selection data is publicly available through the Billboard Magazine website. By analyzing Billboard trends in

Country Music from 1970-2014, it will be possible to see patterns of narrative that show social changes in folk groups of Country Music Consumers, and for the focus of this paper, specifically to women and their relationships to males/authority/self/females/group. Data from the United Nations Reports on Women (1970-1990, 2010) and the United States Census will also be referenced.

**Hughes, Jacob; Wulff, Andrew; Higgins, Barry;** "Analysis Of Fluid-inclusions In Sphalerite From Columbia, Ky" (Andrew Wulff)
The compositions of Mississippi Valley Type (MVT) deposits in the Kentucky-Illinois Fluorspar District have been well-established through numerous regional studies. The purpose of this research is to augment what is known about these deposits by analyzing fluid-inclusions within samples taken from the Andrew Jackson mine in Columbia, KY. Samples were prepared for use on a Linkam heating and cooling stage to examine inclusions as well as determine the temperature of formation. Analysis of samples conducted at the University of Missouri, Columbia revealed the majority of fluid inclusions to be secondary or pseudo-secondary, with a lesser percentage of primary inclusions forming at temperatures less than 150°C. Additional analyses of matrix material conducted using LA-ICP-MS revealed dominant elements including: Pd, Ag, Cd, Ga, and Ge.

**Hughes, James; Gibson, Steven;** "An Automated Algorithm For Identifying Dark H2 Regions" (Steven Gibson)
Star formation, a critical process within galaxies, occurs in the coldest, densest interstellar clouds, whose gas and dust content are observed primarily at radio and infrared wavelengths. The formation of molecular hydrogen is an essential early step in the condensation of these clouds from the ambient interstellar medium. We are designing an algorithm to automate the detection of candidate H2 forming regions from their cold atomic hydrogen content, via narrow hydrogen 21-cm emission lines. We subsequently characterize their temperatures and compositions in terms of atomic gas, molecular gas, and dust using the Arecibo radio telescope, the Infrared Astronomical Satellite, and the Planck cosmological survey mission. We are exploring trends in the fraction of hidden, or "dark", gas that may impact evolutionary development of these clouds.

**Hussung, James** "Faith And Physical Healings In Luke-acts" (Joseph Trafton)
Physical healings are crucial to Luke's narrative of both Jesus' and the apostles' ministry in Luke-Acts. In many of these events, the person healed exhibits faith or belief in the healer's authority or ability. Is there an intricate relationship between faith and physical healing in Luke-Acts? Do stories like the healing of the leper or the healing of the centurion's servant have a deeper meaning than simply Jesus can heal you if you believe he can? This presentation seeks to explore a number of these stories and understand more fully how faith and physical healing interact within the lives of those characters healed in these stories and the role of this relationship in the greater context of the Luke-Acts narrative.

**Huzyak, Paige** "Poly Oligomeric Silsesquioxane Anthracene Dendrimers And Potential Thermoelectric Generation Devices" (Hemali Rathnayake)
Thermoelectric generation devices using inorganic compounds are limited in use because of the expense of creating these materials and their brittle nature. Organic compounds for use in these devices could lead to wider use through inexpensive material generation and the more flexible property of the materials. Poly oligomeric silsesquioxane (POSS) anthracene dendrimer has been synthesized through the carbon-carbon bonding method of Heck coupling for exploration as an appropriate material for organic thermoelectric generation devices. Material and electric characterization has been performed on the compound, and this information will be presented along with an overview of the synthesis.

**Igwe, Igwe** "Assessment Of Indoor Air Quality Monitoring At The Housing Authority Of Bowling Green's Fort Webb Manor" (Iyiegbuniwe Emmanuel)
In August 2012, a group of public health students and faculty conducted a comprehensive indoor air

quality (IAQ) assessment of selected homes at the Housing Authority of Bowling Green's Fort Webb Manor. The purpose of the study was to collect samples for IAQ parameters (temperature, relative humidity, dew point, carbon dioxide, and carbon monoxide) and to educate participants on the potential public health implication of asthma and indoor air pollution. Results showed the following levels (temperature= 67.7-91.1 degree F, relative humidity= 35.0-67.9%, CO2= 444-2,955 ppm and CO= 0-8 ppm). Preventive measures and control strategies are recommended for reducing exposures to environmental triggers of asthma. This pilot study demonstrated the need for a culturally sensitive intervention designed to promote healthier breathing environments in low income and/or high risk populations.

**Irihamye, Aline`; M. Van Meveren, Mayme;** "From Graphite Platelets To Graphene: Direct Liquid-phase Exfoliation Producing Mono- And Oligo- Layered Graphene" (Sanju Gupta)
Graphene, one atom-thick carbon hexagonal sheet, holds promise as 21st century revolutionary materials. Development of methods for producing higher-quality graphene in larger quantities is essential for realizing their applications. Current research on liquid-phase exfoliation (LPE), chemically separating graphite into graphene, has increased to develop graphene paper and nanocomposites. This study has examined the efficiency of LPE with three surfactants, 1-Pyrenesulfonic acid sodium salt, 1-Pyrene methylamine, and Pluronic P-123. After continual centrifugation / ultrasonication, the graphene filtrates are investigated with Raman spectroscopy and atomic force microscopy to determine the quality and thickness. These findings lead to developing more defined procedures for higher yields of single, bi-, and oligo-layered graphene(s).

**Jameson, Sarah** "The Bombing Of Japan" (Beth Plummer)
This paper seeks to explain the enormous toll taken by the fire bombings of Japan during World War II. The bombs dropped by the American XXth Bomber Group inflicted more casualties and more damage than the atomic bombs at Hiroshima and Nagasaki, but were unable to force Japanese capitulation. The campaign is, therefore, not as well-known as others.

**Javangula, Harika; Lineberry, Quentin;** "Comparative Studies On Standard And Fire-rated Gypsum Wallboards" (Quentin Lineberry)
Gypsum, calcium sulfate dihydrate, is a very soft sulfate mineral, with a chemical composition of CaSO4•2H2O that has a broad range of applications in construction, soil conditioners, ceramics, odontology, and paints. Gypsum is commonly used in the wallboards of buildings, where it not only separates spaces, but also serves to slow the spread of fire. This fire resistance property is mainly attributed to the absorption of energy related with the loss of hydrate water as the dihydrate form goes to the hemihydrate (CaSO4 •½H2O) and on to the anhydrous form (CaSO4) in a second dehydration. Various thermal analysis techniques as well as scanning electron microscopy and powder X-ray diffraction were used to characterize the materials. The aim of this current research is to establish a baseline of properties for commercially available products and to compare standard and fire-rated gypsum wallboards. The long-term goal is to develop a wallboard with enhanced fire resistance.

**Jean, Luke** "Mexico's Dark Knights: Autodefensas Role In The Mexican Drug War" (Timothy Rich)
When former Mexican President Felipe Calderón was elected to presidency in 2006, he declared war on the growing corruption machine of drug cartels. With the pressure placed by the president to curb drug traffic and violence associated with the business, an increased amount of violence and illegal actions have proliferated. Citizens in many states of Mexico are frustrated with the assumed lack of action from the Mexican government and international community leading to a reliance on self-defense groups or collections of common people taking up arms against the corrupt cartels. Throughout this research, the power of self-defense groups will be examined in comparison to other nation's successes and failures,

the research also hopes to find a correlation between cartel territory and the concentration of self-defense groups.

**Johnson, Caleb; Johnson, Caleb; Cribbs, Jennifer;** "Technology And Literacy Synergy: A Case Study" (Jennifer Cribbs)
Technology provides a powerful vehicle for creating relevance for our students, but many educators have been slow to integrate tools such as cell phones and iPads because adaptation deviates too much from their preferred methodology and can produce distractions for students. These two factors strongly limit the use of technology especially during literacy components, which require the instructor to have full control of the text and his students' behavior during the critical meaning-making moments. As a practitioner, I have adopted the use of an iPad/Android app called NearPod, which alleviates these problems by allowing me to control and monitor digital behavior. Here I describe how I used NearPod during a lesson on ionic and covalent compound nomenclature in a high school chemistry class in order to enhance my students' literacy levels.

**Johnson, Christopher; Mahmood, Rezaul; Groves, Chris; Polk, Jason; Yan, Jun;** "Influence Of Karst Landscapes On Weather Systems: A Wrf Modeling Study On Responses For Different Land And Soil Types" (Xingang Fan)
The objective of this research was to study the sensitivity of weather events to different vegetation and soil types over a karst terrain. By considering different land surface types over karst terrain, for instance, forest coverage, barren ground (areas of bedrock, desert pavement, gravel, etc.), and sandy soil, the potential impacts for weather development (showers and storms) are to be investigated through model simulations. Limited research has been completed with regards of coupling karst terrain and weather for potential impact study. With vast improvements in technology over the years and advancement in computing power, the ability to better understand these processes, along with karst features (underground caves, sinkholes, etc.) have become increasingly important.

**Jonchhe, Palpasha; Bignell, Elessia; Shearer, Darlene; Aki, Michimi; Gregory, Ellis-Griffith; Matthew, Hunt;** "Bone Density Screening Results In South Central Kentucky, 2006-2011" (Darlene Shearer)
Bone Mass Density(BMD) is the best measure to determine bone health and thus helps to monitor osteoporosis. BMD varies in people based on age and gender. This study examined the relationship between BMD and demographic variables using data from the Institute of Rural Health at WKU that conducted BMD screenings from 2006 to 2011 via free mobile health clinic service. Descriptive statistics were used in finding the various relationships between BMD and demographic variables. T-scores used in BMD between -1 to -2.5 indicated the beginning of bone loss (osteopenia) and below -2.5 indicated osteoporosis. BMD decreased as age increased and it was lower among females compared to males. In conclusion, females are more vulnerable to bone related disease (osteoporosis) and the risk increase as they age.

**Jones, Natalie; Conte, Dr. Eric; Loughrin, Dr. John; Cook, Dr. Kim; Bryant, Mike;** "Tetracyclines In Swine Waste" (Dr. Eric Conte)
Title: Tetracyclines in Swine Waste Authors: Natalie Jones, Dr. Eric Conte, Dr. John Loughrin, Dr. Kim Cook, Mike Bryant Key Words: LCMS, Antibiotics, Swine, Waste Abstract: Antibiotics are added to animal feeds as prophylactic agents and to encourage weight gain in livestock. However, there is concern that the widespread use of antibiotics in animal agriculture encourages for the selection of resistance genes and has contributed to the rise of multiply antibiotic resistant strains of pathogenic bacteria. For this reason, there is interest in quantifying antibiotics in environmental samples. We present the determination of three antibiotics, namely Chlorotetracyline, Tetracycline and Oxytetracycline using LC-MS with electrospray ionization in swine waste.

**Kadric, Dzenana; Beckner, Chasity; Leigh, Tanner; Owens, Shelley;** "The Iraqi Community In Bowling Green" (Alex Olson)
During the course of this report, we aimed to assess the needs of both Iraqi immigrants, and more specifically in Bowling Green, Iraqi refugees. It is our hope that this report will educate readers about some of the many ways that Iraqis are contributing to the community of Bowling Green, as well as ways that Bowling Green can become a more welcoming place. From our interviews with community members we found that Bowling Green has established many programs, from employment services to language programs, to ease the transition of Iraqi refugees into the community. We found practices from other refugee-welcoming communities that show the potential to be effective if implemented in Bowling Green. We have determined that the most promising direction for the community is to close the gap between non-Iraqi community members and Iraqi refugees.

**Kahindi, Bright** "ENHANCING PROJECT MANAGEMENT PROCESSES FOR NEW PRODUCT DEVELOPMENT" (Ahmed Khalafallah)
New products initially suffer from low demand, which results in significant uncertainties in their supply chain management. This is mainly due to the difficulty in changing customer habits, and the typical product the customer is used to purchase. In order to address this challenge, companies strive to implement various to encourage customers to buy new products and as such improve the efficiency of new product development. This study focuses on (1) identifying the factors that impact the initial offering of new products; and (2) providing insight on how project management can deal with these factors in order to improve their supply chain management. The study will use questionnaires to pool experts and customers opinion on the factors that impact the demand of new products. This should prove useful to project managers and researchers in the domain of supply chain management.

**Kakavand, Pegah** "Integrating Earned Value Analysis and Risk Management Techniques to Improve Cost and Time Estimation" (Ahmad Khalafallah)
Fundamental questions for construction managers include “how much” and “how long” will it take to complete a project. Earned Value Management (EVM) is a robust method for forecasting these aspects. Earned Value Management predicts the project future performance based on previous and on-going trends. Despite the robustness of EVM, it does not account for the risks involved in the project, environmental condition changes and materials availability. On the other hand, some risk management techniques are effective in addressing these issues. This paper presents a study that combines EVM with effective risk management methodologies in order to improve the accuracy of cost and schedule estimation. The research adopts a quantitative methodology that includes data collection, statistical and numerical analysis in order to facilitate the integration of risk management techniques into the practices of Earned Value Management.

**Karim, Ali; Jennings, Kane;** "Ph Switchable Surfaces For The Trapping And Release Of Trapped Substances" (Eric Conte)
Hydrophobic substance can stick efficiently to a hydrophobic solid phase surface. The substance can be removed with an introduced response (i.e. pH change) allowing the surface of the solid phase to change from hydrophobic to hydrophilic, weakening the substance’s attraction to the solid phase and thus resulting in an easy removal. A unique surface has been prepared having a terminal anthranilic acid group. At low pHs this group is neutral and intra-hydrogen bonding keeps this group with the phenyl (hydrophobic) portion expose to the surface. At higher pHs the group’s carboxylic acid group becomes the charged carboxylate (hydrophilic). This will allow for an easier release of hydrophobic naphthalene compare to a hydrophobic surface. Substances can be trapped and released using this unique switching approach.

**Keen, Cortney; Tarter, Kirsten; Duffin, Ph. D., Lisa; Clayton, Ph. D., Krisstal; Attaway, Matthew; Doyle, Anastasia;** "Promoting Mental Health Awareness Among College Students" (Krisstal Clayton)
In the present study, the investigators are examining the various effects of adverse life events of Western Kentucky University students. Adverse life events were measured using the Traumatic Stress Schedule (Norris , 1990). Within the sample, 14.6% had a family history of mental illness, 9.8% had personally been diagnosed with a mental illness, and 12.2 % had sought mental health treatment. In the study, 44.7% had experienced at least 1 adverse life event. Adverse life events have been demonstrated to strongly predict psychological disorders (Mazure, Bruce, Maciejewski, & Jacobs, 2000). However, 32.5% of students that had experienced adverse life events did not seek seek mental health treatment. The current purpose is to highlight existing research to answer the questions of a) why college students may or may not choose to seek mental health counseling and b) what are the potential benefits of mental health counseling. We will also highlight the resources available to WKU students.

**Keith, Hannah; Inabnitt, Courtney;** "The Pursuit Of Effective Teaching" (Lisa Duffin)
Teaching, like acting, combines the creativity of art and the methodology of science. In this WKU "Feature" Event, we highlight one professor's pedagogical vision to make the learning science curriculum come alive for pre-service teachers. Knowing and Learning in Mathematics and Science is a required course in the SKyTeach series where students are introduced to the empirical foundation behind effective teaching. In this installment, pre-service teachers are charged with taking the given script and making it come alive (i.e., creating inquiry-based integrated science and math lessons) by applying newly constructed knowledge. In the final scene, the students' personal realizations that effective pedagogy stems from the critical application of the curriculum is Oscar-worthy.

**Kemp, Emily** "The Equal Rights Amendment" (Patricia Minter)
The Equal Rights Amendment faced many movements against its passing that continued from the 1920s to modern day; focusing specifically in the 1970s, it is apparent that the rise of the Republican Party and Conservative New Right ultimately destroyed passage for the ERA. The ERA came at the cusp of a societal wave that took traditional views of individual rights and applied them to women's rights. Man was no longer against women gaining equality, women were against women. The debate of the ERA was extremely widespread and a regularly discussed aspect of life in the 1970s. This led to the controversy of the amendment and its unfair portrayal by the media that eventually caused its ultimate defeat. The rise and fall of the women's rights movement in the United States is exemplified by the story of the ERA.

**Kherde, Yogesh** "Green Synthesis, Characterization Of Sugar Coated Gold Nanoparticles For Catalytic Applications" (Dr.Rajalingam Dakshinamurthy)
Gold nanoparticles (GNPs) have gained an immense interest due to their wide applications in the fields of biomedical and pharmaceutical. Here, we present a novel single step biofriendly process for synthesis of directly capped fructose (monosaccharide), sucrose (disaccharide) and raffinose (trisaccharide), starch (polysaccharide) GNPs. The study focussed on effect of various lengths of sugars in formation and catalytic reduction activity of sugar capped GNPs. Characterization of synthesized GNPs was done using TEM, SEM-EDS, FTIR, UV-Vis spectroscopy. P-nitrophenol assay was used to evaluate the catalytic reduction activity of sugar capped GNPs. Using the spectroscopic data, rate constant followed by its activation energy was determined. From the kinetic data, the catalytic reduction activity for three sugars was in the descending order of fructose, sucrose, raffinose and starch GNPs respectively. This difference in the catalytic activity is believed to be due to the size of ligand.

**King, Allyson; King, Rodney A.; Rinehart, Claire A.;** "Discovery And Characterization Of Bacteriophage Larenn" (Rodney King)
Bacteriophages are viruses that specifically infect bacterial hosts. During infection, they eventually lyse or destroy the host cell and release newly assembled progeny into the environment. Here we describe the isolation and characterization of a newly discovered mycobacteriophage named Larenn. This phage was recovered from an environmental sample taken from Western Kentucky University's campus. Agarose gel electrophoresis was used to analyze the pattern of DNA fragments that were generated after cutting genomic DNA with different endonucleases. Electron Microscopy revealed that Larenn's phage particles have 131 nm noncontractile tails and 42 nm icosahedral heads. The complete DNA sequence of Larenn's genome belongs to the A2 subcluster of mycobacteriophages.

**Kinnicutt, Sarah** "Les Villes Jumelées: Finding Bowling Green A French Speaking Sister City" (Eddy Cuisinier)
This project seeks to establish a new sister city relationship between Bowling Green and the French-speaking city of Porrentruy, Switzerland. WKU French students have paired with a French-speaking high school in Porrentruy, Switzerland. A class web page enables students to exchange letters and projects about life in their native countries. High school students in Bowling Green are also participating by putting together a box of items that represent Bowling Green and sending it overseas. These interactions will not only encourage cross-cultural relationships, but give students a new way to use their language skills. Hopefully, these experiences will encourage future language study. As WKU strives to become a university with international reach, it is important that the community develops and maintains international relationships as well.

**Kirk, Cody** "Achieving Competitive Advantage With A Designated Hitter" (Leyla Zhuhadar)
Our research topic was brought up by a discussion between the two of us one day while sitting in class, both Cody and I being huge baseball fans, we decided to do some research and make it our project for CIS 243. The question was, does the American League have competitive advantage with the Designated Hitter Rule? Which is rule 6.10, stating that a batter may be used in place of the starting pitcher, compared to the National League who does not use the rule. We compared stats such as Home Runs, Runs Batted In (RBI), and Batting Average between different teams, and the stats for the Designated Hitter position itself. The rule was implemented in 1973 so we researched through databases all the way through the 2013 season to find our stats. We found that, the DH is only a small part of a team's and a league's success. The other members of the team must contribute to hitting, defense, and other parts of the game in order to win games.

**Kleinhelter, Georgina** "Cunicular Domesticus" (Laurin Notheisen)
My prints feature small, semi-anthropomorphic rabbits, beginning with the depiction of a romantic date, which then leads into an unforgiving reality of adulthood, responsibility, and burden. Their bodies, like their story, are small in comparison with the lovely environment surrounding them. In this way, their joys and struggles are insignificant against the rest of the world. The compositions make allusions to both Eastern and Western styles. The rabbits themselves are cute, and their environments are lush and without blemish. But the narrative of their lives is not, and so the atmosphere of these pretty compositions is contradictory and subtle. In this way I am inviting my audience into the narrative, providing them with the materials to become story-tellers themselves.

**Kleinsmith, Elias** "Digital Avant-garde: Pushing Against The Digital Forecast" (Jerod Hollyfield)
The discourse of the digital forecast, as discussed in Philip Rosen's Change Mummified, "delineates characteristics of the digital as existing though pure ideals rather than impure actualities, things that will eventually be achieved" (Rosen 2001). In mainstream media, the digital forecast manifests itself as a

constantly changing “media translation” (Manovich 1999) that continually renders format after format obsolete. Some avant-garde artists like Vuk Cosic and JODI comment on the flaws in the digital, while at the same time using it as their medium. They seem to push against the digital forecast by anchoring their work within a specific moment of digital progression. In this paper, I will use a few examples of avant-garde video and web art to argue that these artists are attempting to expose a flaw in the digital forecast.

**Knowles, Bryan** "Clockwise Visualization Of Spatio-temporal Summary Data" (Stuart Foster)
We define and present a novel method of visualizing summary data distributed across both time and space, e.g., average temperatures of weather stations in Kentucky for each day in a given month. Our method arranges data points for a geographic location as wedges in a circle, starting at the twelve o' clock position and wrapping around clockwise as necessary. We posit that this approach allows the audience to visualize spatio-temporal trends quickly and without distraction. Simply plotting data points in a line might trick the user's eyes into reading the geographic data left-to-right, making accurate trends more cognitively expensive to detect. By using circular graphics, the eye is not drawn in any particular direction, reducing semantic noise. This approach is simple, static, and does not require complex, three-dimensional figures.

**Kolanka, Varun Kiran; Cao, Yan; Webb, Cathleen;** "The Thermal Analysis And Properties Of Ionic Liquids" (Yan Cao)
Ionic Liquids(ILs) are liquid organic salts at room temperature which are composed of only ions (cations and anions). ILs are regarded as "novel solvents"and has been gaining lots of attention as alternatives to volatile molecular organic solvents. ILs have outstanding properties such as negligible vapor pressure, Low melting point, thermal stability and ionic conductivity. They can be used in advanced, efficient and clean energy production and storage. ILs are used as thermal liquid storage mediums in solar thermal conversions and nuclear fuel, electron transportation mediums in batteries, super capacitors, fuel cells, CO2 capture process. The synthesis of the low cost and performance effective ionic liquids using inexpensive raw materials is experimented and characterization were done using TGA ,FTIR, SDT and NMR.

**Kratt, Adam; Peters, Victoria; Fulkerson, Laura;** "A Pilot Study Of Indoor Air Quality Assessment Of Selected Homes In Gales Point, Belize" (Emmanuel Iyiegbuniwe)
A pilot study was conducted in January 2014 at Gales Point, Belize, a rural village of 300 people located within a peninsula by the Caribbean Sea and home to the endangered West Indian Manatee. The purpose of this FUSE grant study was to enhance students’ research skills through integration of international academic and co-curricular experiences. Airborne concentrations of indoor air quality (IAQ) parameters (Temperature, Relative Humidity, Carbon dioxide, and Carbon monoxide) were measured at twenty homes. Samples were collected from the family room, bedroom, kitchen, and outdoor using direct-reading and data-logged instruments. Results showed high levels of measured IAQ parameters.

**Kresse, Isaac** "A Photocatalytic Reactor For Use With Raman Spectroscopy To Analyze Photocatalytic Degradation" (Matthew Nee)
Pharmaceuticals found in wastewater, including iodinated X-ray contrast media (ICM), are often not removed by current treatment methods. Photocatalytic degradation is a promising method of degrading ICM in water. Our group uses Raman spectroscopy to analyze the degradation of ICM. For this study, a photocatalytic reactor was designed for use with Raman spectroscopy. This reactor allowed spectra to be collected over the course of 5 hr, produced cleaner spectra, and improved time resolution. The photocatalytic degradation of diatrizoate was analyzed using this reactor and titanium dioxide as the photocatalyst. However, usable spectra were not able to be collected with the photocatalyst present. The

reactor will be adapted next to collect spectra with the photocatalyst, more ICM will be analyzed, and reaction pathways will be postulated.

**Krishna, Nitin** "A Mathematical Model for the Interaction of the Proteins MMP-1, TIMP-1, And ECM in a Wound" (Richard Schugart)
This study aims to formulate, quantify, and analyze a mathematical model describing interactions among matrix metalloproteinases (MMP-1), their inhibitors (TIMP-1), and extracellular matrix (ECM) in the healing of a diabetic foot ulcer. MATLAB, a technical computing environment, was used to estimate parameter values by minimizing the least-squares residual between model output and biological data from sixteen patients. A steady-state analysis identified which end-states the proteins tended to as time approached infinity. A classical sensitivity analysis followed by an SVD-QR subset selection numerically measured to what degree the model was affected by slight changes in one or several parameter values. The developed model has the potential for application in clinical studies, such as identifying treatment regimens for individual patients.

**Lancaster, Zach; Reesor, Jesse; Johnson, Will; Lenoir, Joel; Tinker, Darren;** "Making Quadrotor Research Affordable" (Joel Lenoir)
Despite a large growing interest in the field of UAS (unmanned aerial systems), there is only a limited selection of aircraft available for purchase. The goal of my research is to design an affordable quad-rotor –remote controlled helicopter– UAS platform that can be easily adapted and utilized in future research. To accomplish this I will be conducting tests on various engineering materials to use for the frame, specifically focusing on strength to weight ratios and the transmittance of vibrations. Research will also be conducted into designing a platform to easily allow additional sensors and payloads to be attached. Additional goals of this project are to build a medium size form factor to allow flight both in indoor and outdoor conditions, and to utilize easily replaceable parts in the event of a crash or part failure.

**Larkin, Clay** "Creating A Healthy Space For A Healthier Community" (Laura Leach)
Tending the less fortunate is a moral obligation of society and architecture alike. A lasting public servant is created for South Central Kentucky in the form of a community health center through the means of concrete, steel and space. Research has involved the utilization of sustainable materials to create a clean-healthy atmosphere, and blending theory with function behind the creation of clean spaces to promote well-being, both physically and socially. Additional research focused on highlighting natural daylight throughout the building, while also providing comfort and privacy to healthcare spaces. The scope of the project is a new building, providing a free health clinic along with a community educational center to the residents in and around the area.

**Lee, Sukyeon; Burris, Stuart; Conte, Eric;** "Electrically Controlled Formation And Release Of Admicelles For Solid Phase Extraction" (Eric Conte)
Solid phase extraction is one of the widely used methods to concentrate diluted compounds in a solution. In our approach substances can be extracted into admicelles and hemimicelles. We present investigations of the electrical control of surfactants for the purpose of analyte preconcentration prior to chromatographic analysis. The surfactant layer serves as the stationary phase in a solid phase extraction, and analytes are sorbed on this layer then are released from the solid phase via surfactant removal. The attachment and removal of the surfactant are controlled by means of an electric field. Compared to the conventional method this procedure is advantageous for method development and environmental concerns. We present the preconcentration of 2-naphthol using the electrical control of dodecylsulfate as the surfactant on gold.

**Leggas, Dimitri** "Counter-propagating Wave Methodologies For Stationary Scattering State Calculations" (Jeremy Maddox)
In this work we present a generalization of the bipolar counter-propagating wave methodology (CPWM) for calculating stationary scattering states of simple 1D quantum barrier problems. CPWM utilizes a so-called "bipolar decomposition" of the stationary state wave function in terms of counter-propagating wave components (i.e., $\Psi = \Psi+ + \Psi-$). Our generalized approach involves the selection of a pair of constraints, which we refer to as the phase and bipolar conditions. Together with the time-independent Schrödinger equation these conditions lead to a pair of coupled pseudo-time-dependent hydrodynamic equations for $\Psi+$ and $\Psi-$. In this study we explore the significance and computational advantages of different phase and bipolar conditions on the short-time relaxation dynamics for various 1D scattering problems.

**Lengeman, Kara; Schroeder, Amber;** "Can You Hear Me Now? Examining Student-faculty Communication Expectations And Perceptions" (Amber Schroeder)
Participants were students and faculty from psychology classes at Western Kentucky University. Students and faculty completed surveys at the beginning and end of the semester. The study looked at communication expectations, communication preferences, stress, goal orientation, personality, and performance outcomes. In a longitudinal study examining the interaction between students and faculty, results indicated that lower performing students tended to have higher faculty communication expectations. Additionally, student personality was linked to student performance, and faculty characteristics were associated with communication quality. These findings are important because they give faculty and students a better understanding of how communication expectations and professor and student characteristics play a role in classroom outcomes.

**LeRoy, Madison** "Choices Or Discrimination: Examining The Causes Of The Gender Pay Gap" (Kelly Reames)
The gender pay gap has been in existence since the 1800s when women began entering the labor force at the onset of the Industrial Revolution. From the 1820s to 1994, women's earnings increased from 30% of men's earnings to 74%. However, since the 1990s the ratio of women's pay to men's pay has remained stagnant at 77%. Despite much debate, researchers have yet to reach a consensus on the source of the pay gap. Some believe that the discrepancy between men's and women's pay is due to women's career choices alone, while others attribute it to workplace discrimination. My paper will examine the history of the gender pay gap to reveal what changes have been catalysts to narrowing the gap in the past, and building on the historical context, I will argue that the gender pay gap results from both women's choices and workplace discrimination.

**Lewis, Abigail; Schroeder, Amber;** "Social Networking Profile Assessment In Employee Evaluations: Should Organizations "like" This Practice?" (Amber Schroeder)
This study examined how various components of a social networking website (SNW) as well as rater characteristics can impact employee evaluations. Participants were presented with a job description, an applicant résumé, an applicant SNW profile, and a survey to measure rater characteristics. Professionally-oriented and high integrity Facebook profiles received higher ratings than their counterparts, evaluations differed based on rater characteristics (e.g., personality), and raters varied in their perceptions of the relative value of SNW profiles. As these findings demonstrate that SNW profiles influence employer judgments to varying degrees based on rater characteristics and perceptions, organizations should use caution when viewing SNW profiles until more research is available to demonstrate the reliability and validity of this practice.

**Lile, Cameron; Schroeder, Amber;** "Examining Legal Precedents For Organizational Social Media Use" (Amber Schroeder)
This study examined court cases related to the use of social media websites (e.g., Facebook, Twitter, Myspace, LinkedIn) in various employment practices (e.g., selection, promotion, employee monitoring, layoffs). Court cases were identified using various online databases in an attempt to create an exhaustive list to be used to better understand the role that social media has played in organizational settings and the legal implications of their use. The results of this study will provide organizations with a better understanding of how organizational social media use has been perceived in the court of law, thereby allowing employers to make better decisions regarding their use.

**Lindsey, Colton** "Comparative Analysis Of Two Supercell Thunderstorms From May 2013" (Joshua Durkee)
In May 2013 the Western Kentucky University Field Methods in Weather Analysis and Forecasting class set out to forecast and document the outcomes of two potentially dangerous supercell thunderstorms, capable of producing violent tornadoes. These events took place on 25 and 30 May 2013 near Bear Butte, SD and Chickasha, OK, respectively. For these events, surface observations, high-resolution mesoscale models, and remote sensing data from the GOES East geostationary satellite and local level 2 radar were utilized. The purpose of this study is to provide and investigative analysis on why these two similar thunderstorms developed in an environment conducive toward tornado formation and never produced a tornadic circulation.

**Lindsey, Jonathan; Khamvongsa, Kenny; Bratcher, Stephanie;** "Hygreen Handwash Redesign Project" (Stacy Wilson)
Abstract HyGreen Handwash Redesign Project Many deaths occur each year due to a healthcare professional who forgets to clean their hands before interacting with a patient. The lack of sanitation can cause fatalities by the spread of infections and diseases. HyGreen's Handwash Station can help keep health care professionals sanitized by providing them with an alert if they are about to interact with a patient before washing their hands. This hand wash system is also capable of logging a failure to comply so that healthcare professionals can be held accountable for their negligence. The design team is determining an alternative to using a vibration sensor to activate the signal to log that a hand wash has occurred. It is desired to lower or prevent a false activation due to closing doors or other possible actions.

**Liu, Xin; Yan, Bangbo;** "Synthesis, Properties And Mercury Adsorption Of Porous Metal-organic Frameworks" (Bangbo Yan)
MOFs (Metal Organic Framework) as a new class of porous material aroused great interested due to their potential applications such as absorption, catalytic, and ion exchange. Our research is dedicated to the study of MOFs with a relatively strong adsorption of mercury and high thermal stability properties. In this presentation, we report the study on two known metal-organic framework, [Cu3(trz)3(OH)3(H2O)4]•4.5 H2O (trz = 1,2,4-triazole) and Zn-HMeIM (HMeIM is 2-methylimidazole). These materials show three-dimensional channels and high thermal stability after the removal of the solvents in the channels. We will report the synthesis, thermal properties and mercury absorption studies for these materials.

**Logsdon, Holly** "zen Buddist Elements in Frost's 'mowing' and Emerson's 'brahma'" (Mary Ellen Miller)
Through original research and literary analysis, my paper seeks to make the connection between Zen Buddhism and two poems by Frost and Emerson. A thorough explication of Frost's "Mowing" and Emerson's "Brahma" leads to unmistakable correlations with Zen Buddhism. The mower seeks a spiritual awakening similar to that of Zen Buddhist trainees. He asks a series of questions, or koans, to puzzle out the meaning of life. Emerson's "Brahma" uses a different approach to express the same ideas.

The speaker represents the universal soul or Brahman, to which all living things are connected. Rather than asking questions, the speaker already possesses the answers. He reveals those secrets by dispelling a series of false conceptions in favor of ultimate truth. Reminiscent of Zen Buddhism, Frost and Emerson beckon the reader to a spiritual awakening, to oneness with the universe, to enlightenment.

**Lowry, Danielle** "The Neural Correlates Of Human Discrimination Learning" (Sharon Mutter)
Event–related potentials (ERPs) were recorded during two discrimination learning tasks. In the tasks, participants located a target after the appearance of a valid or invalid cue and reaction time was measured. The cue, a bi-color arrow, pointed to the target 100% (valid predictor) or 50% of the time (invalid predictor). Either the presence of a specific color in the cue (feature positive, FP) or the absence of a specific color (feature negative, FN) indicated a valid cue. Learning the FP or FN rule allowed participants to respond faster. It was hypothesized that the FP rule would be learned faster than the FN rule and that implicit rule learning would occur before explicit rule verbalization. ERP components recorded from brain activity were predicted to reflect achievement of explicit awareness of the rule.

**Luo, Wei Long** "Axial Ligand Effect On Catalytic Oxidation Of Sulfides By Manganese (iii) Porphyrin Complexes" (Rui Zhang)
Selective oxidation of sulfides to sulfoxides by metal catalysts is of great importance in organic synthesis and industry. In this study, a series of manganese (III) tetramesitypophyrin with different axial ligands, i.e. (TMP)MnIII-X (X=Cl,ClO4, ClO3, NO3 and NO2), have been prepared and spectroscopically characterized. Under optimal conditions, manganese (III) porphyrins catalyze the selective oxidation of sulfides to sulfoxides with PhI(OAc)2 as oxygen source. A significant axial ligand effect on the catalytic sulfoxidations was also observed.

**Lyle, William** "Herbal And Holistic Medicine In Mexico And Peru" (William Mkanta)
A variety of herbal and holistic remedies were used in pre-Columbian cultures, especially in Aztec and Incan cultures. Many different herbs were used to provide medical attention to patients directly, while other herbs were used to supplement shaman medicine, which was particularly common in Inca culture. While there is little scientific basis for shamanism, as a viable healing option in modern culture, most herbal remedies had active chemical ingredients that could be or are used today to treat similar symptoms, and, in some cases, are being applied in different scenarios as well. The methods of usage, active chemicals, and symptoms treated are discussed for each herb, with special attention paid to those that can be applied today, with a focus on the feasibility of herbal therapy today as an alternative to chemical medicine.

**Lynch, Kelly** "The Discovery And Analysis Of Athrobacter Phage Ezio" (Claire Rinehart)
There are more bacteriophages on the planet than any other biological entity. Accessing their commonalities and their diversity gives us a glimpse into the mechanisms of their success. Bacteriophages are extremely useful in nature and in commercial settings for their ability to kill bacteria. The goal of this study was to isolate and characterize a phage, from the environment, that was specific for Arthrobacter. The phage Ezio was collected from a soil sample taken outside Burkesville, KY near Dale Hollow Lake on August 31, 2013. Ezio was purified and amplified to the point where its DNA could be recovered. Ezio DNA was characterized by restriction digest analysis and was sequenced. Electron microscopy revealed Ezio morphology to be a circular head with a long, straight, non-contractile tail. Ezio produced minute lytic plaques.

**Maase, Jakob** "Being Human" (Michael Ann Williams)
The furry subculture is a modern culture that basis its social identity through anthropomorphism. Through play and creating art the individuals of the furry subculture take on an anthropomorphic

identity, while bridging local and global groups through technology. My ethnographic research amongst the Manhattan furry population, mainly the ASK group (Anthropomorphic Society of Kansas State), challenges how we define human identity psychologically while showing how that identity is created through agency and environment. This research was done through 64 hours of field work, interviews with 20+ individuals, the attendance of a furry convention, and analysis of digital and material culture. Overall this research shows anthropomorphism's role as a creator of new ideas while providing insight into how we view ourselves as humans.

**Mackin, Crystal** "Developing A Pet Mall" (Laura Leach)
This particular facility does not exist in the Union, Henderson, Webster, Crittenden counties in Kentucky, consisting over 50,000 people. Feasibility research shows that citizens in these areas would utilize a new pet care facility that can sustain/improve a large variety of pets well being, such as cats, dog, reptiles, exotic fish, and birds. The intent of this project is to bring pet care to a variety of pets in an area with limited resources, and for the pet owners to experience a pet store in a whole new perspective. Research was performed on pet care methods, products, housing, and foods. The research conducted on sustainability: new wall types and window types, hard wood flooring, ICF walls (Insulated Concrete Forms), and LED lighting.

**Mahmood, Muhammad** "The Reaction Rates Of Chemotherapy Drugs With Protein And Dna" (Kevin Williams)
Common chemotherapy drugs react with protein faster than with target DNA thus leading to cytotoxic side effects. The addition of heterocyclic ligands has been observed to add steric hindrance cis to the leaving ligand, and thus larger ligands will greatly diminish the rate of substitution. This steric hindrance retarded the methionine reactions to a degree that very much exceeded the adverse effects on the DNA reaction, as was observed through a proxy of the variant platinum drugs reacted with 5' GMP (DNA) and NAc-Met (protein). Nuclear magnetic resonance spectroscopy was significant in determining the reaction mechanisms. It was noted that neither the DNA nor the protein displaced one another when added to a reaction that had gone to completion. The ratio of reagents did not affect coordination sites of the platinum compound as it had in an earlier experiment. If more ligands can be found to retard the methionine reaction, chemotherapy effectiveness could be greatly increased.

**Malloy, Elizabeth; Grubbs, Scott; Meier, Albert;** "Trophic Dynamic Interactions In A Temperate River: A Comparison Between High And Lower Karst Flow Reaches" (Scott Grubbs)
Seasonal growth of filamentous algae is usually associated with nutrient-rich waters. Our research compared foodweb structure between river reaches with contrasting karst topography, nutrient levels, and filamentous algae cover during late spring. Primary consumers in the downstream reaches with high filamentous cover were expected to assimilate a higher proportion of filamentous algae compared to consumers in the upstream reaches with markedly-less filamentous cover. While primary consumer stable isotopes changed between upstream and downstream reaches, this may reflect isotopic changes in in-stream producer isotopes rather than changes in consumers' diets. Mixing models suggest that consumers assimilated low to moderate amounts of filamentous algae in all reaches, likely due to the low availability of filamentous algae in mid-spring.

**Mann, Shareen** "A Qualitative Examination Of Corruption In Indian Cricket" (Paula Upright)
In India the sport of Cricket is comparable to the NFL in the USA. It is a source of pride, economic benefit and political power for 1.27 billion people; however the sport is facing numerous corruption scandals. The purpose of this study is to examine the popularity of Cricket related to the corruption currently facing the administrators, coaches and players. This qualitative research will examine player attitudes regarding Cricket in India. Data collection will include document mining and interviewing

cricketers. The data collection is ongoing. Outcomes will provide an understanding of growth and development of Cricket in India, a description of the corruptions in the sport and an understanding of player perspectives regarding the aspects of the game and its problems. The data from this study can prove useful for sport managers.

**Manny, Gabrielle; Stinnett, Dr. Brad;** "Attitudes Toward Sustainable Practices In Recreational Sports Facilities" (Fred Gibson)
Sustainability is a hot topic in higher education. Collegiate recreational sports programs often include facilities that pose a challenge to the green movement, due to their size and operational requirements. The purpose of this study was to assess levels of personnel familiarity and institutional level of adoption related to sustainable initiatives at collegiate recreational sports facilities. This study attempted to create some benchmark data for the collegiate recreation industry within the National Intramural-Recreational Sports Association (NIRSA) via a collection of perceptions of the benefits and challenges of implementing such initiatives. Additionally, this study establishes a foundation for further research on sustainability efforts in collegiate recreational sports.

**Marsh, Whitney** "Gender And The Evolution Of The American Tattoo" (Kristi Branham)
Tattoo culture in modern American society has gone through four waves. The initial wave was wrought with exploitation of native people; the second wave saw tattoos adopted by American servicemen, and the third wave returned tattoos to its previous position as a stigmatized activity when various deviant sub-groups began participating in tattoo culture. Currently, the United States is in a fourth wave often referred to as “the tattoo renaissance.” Throughout the first three waves, tattooed females were considered in violation of social norms; tattooing was almost exclusively a male endeavor. I will map the ways female participation in tattoo culture re-situated tattoos from solely a consumable commodity to a respected form of art, allowing for more open acceptance in modern culture.

**McClanahan, Kegan; Osterhoudt, Laura; Groves, Chris;** "Utilizing δ13c To Track The Riverine Carbon Cycle In A Karstified Catchment" (Jason Polk)
An important line of research into global climate change is the response of the carbon cycle to increased atmospheric carbon dioxide (CO2) concentrations. Karst landscapes, like south-central Kentucky, are controlled by the dissolution of carbonate bedrock through the interaction of atmospheric CO2 and water to dissolve bedrock. Rivers represent the primary conduits of dissolved carbon from terrestrial ecosystems to ocean basins wherein internal and external cycles represent the concentrations and sources of carbon. This study aims to capture the seasonal carbon dynamics of the Green River by tracking the sources and fluxes of the carbon cycle with stable carbon isotope (13C) samples, along with geochemical and biological data. Together these data will present a complete picture of the seasonal carbon dynamics within the river.

**McGuire, Matt** "Senior Exit Exam Data Analysis" (Dawn Bolton)
Graduating seniors from the Gordon Ford College of Business (GFCB) are given an exit exam each semester to measure if they are meeting the Assurance of Learning Committee’s goals. However, the GFCB is missing an opportunity to further analyze the data to determine specifically, and to what extent, their students are learning. Currently, the data is vulnerable to subjective numerical bias, lacks depth, and is difficult to interpret. Quantitative analyses could be used to determine whether the departments should make academic adjustments to improve discipline knowledge reflective of the curriculum, and to evaluate how the examinees compare across departments and previous semesters. Discussion of the current work and interpretations of potential statistical analyses of the GFCB senior exit exam data will be presented.

**McHargue, Chris** "Disembodiment Of Violence In Film: Why Americans Seem To Enjoy Violence" (Jerod Hollyfield)
It breaks our hearts when we hear about violent tragedies on the news and for good reason. Whether it be some mass shooting, or drug related crime. However, we have been captivated for decades by violence in media. Whether that is watching a mobster whack a guy for disrespecting him, men who rob banks, or a cocaine snorting Cuban who just wants you to say hello to his little friend. I am not trying to convince you that these type of films have any correlation with real acts of crime. However, I plan on taking a deeper look into why people fall in love with characteristics, such as, Don Vito Corleone, Tony Montana, and others. I am interested in seeing why we hate these types of violence in real life, but are captivated with what we see on screen. Even when some of the stuff we see on screen is depicted on real life events.

**McNally, Kelsey** "Crashing, Painting, And Choosing" (David Bell)
Title: Crashing, Painting, and Choosing Subject Area: Humanities Equipment Needed: Poster Easel Abstract: “Crashing, Painting, and Choosing” is a collection of short stories that were written and edited during my college career. When writing these short stories, I found myself coming back to female characters. To start the collection, the youngest character, set in a high school, begins the reader’s journey. Another story, taking a leaf from Jane Austen's "Pride and Prejudice", is a retelling of one of my favorite books from the viewpoint of modern day college student. Another story is about a young woman named Graziella from Italy, whose story is a twist from the life of a well-to do heiress. Also included is an a fantasy story in which the main character must make a choice. Finally, the collection is closed with a longer piece that contains multiple narrators, but centers around their interaction with the main character.

**McNeal, Lillian** "Factors Involved In Early Age Dental Visits" (Lynn Austin)
“Factors Involved in Early Age Dental Visits” By: Brooke McNeal Today, more children are diagnosed with Early Childhood Caries (ECC) than at any other time in modern history. It is noted that Early Childhood Caries (ECC) is now the most common infectious disease among children, and occurs 5 times more than asthma (American Academy of Pediatric Dentistry, 2014). Considering the extent of this disease, it is imperative to determine the cause of it and factors involved in the control. In order to begin this study, one must first analyze different patients and their living conditions, along with the frequency of dental visits and when the first dental visit occurred. What can be done to stop the growing incidence of ECC? To answer this question an interview session will take place with thirty parents of six-year-old children to gather demographic and background data. After a detailed interview with these parents, the researcher will discuss important home dental care tips.

**Mehrabi, Arezoo** "Employing Best Practices of Project Risk Management in Healthcare Organizations" (Ahmed Khalafallah)
Project Risk Management is one of the knowledge areas in the body of knowledge on Project Management, and focuses on the unforeseen events that may affect project progress and result in positive or negative outcomes. The main objective of risk management is to identify each risk factor involved in a project, the probability of occurrence of the factor, and its impact on the project objectives. This study aims at analyzing the processes used in identifying and controlling risks in healthcare organizations. The study also highlights the value of Project Risk Management in healthcare organizations, how risk management systems are implemented for healthcare projects, and the possible impacts of these systems on project performance. Existing case studies on Project Risk Management are analyzed and compared to achieve the aforementioned objectives. This should prove useful to project managers and researchers in the healthcare domain.

**Melcher, Jaclyn** "Wild Beasts: Analyzing Elements Of Magical Realism In Films Portrayed From A Child's Perspective" (Jerod Hollyfield)
Upon winning the Caldecott Medal in 1964 for Where the Wild Things Are, author Maurice Sendak explained, "It is through fantasy that children achieve catharsis. It is the best means they have for taming wild things." Psychology has shown that adolescents engage in imagination as a means to cope with and understand the world around them. These fantasies are often closed off as a person progresses toward adult maturity, but films such as Where the Wild Things Are and Beasts of the Southern Wild offer an experience for adult viewers to pull back the curtain and see once again through the lens of childhood. In this paper, I will explore the imaginative world of each film's child protagonist, making connections between Max's and Hushpuppy's own fantasies and realities, and examining how they decipher the problematic issues they're faced with.

**Miller, Joshua** "Not Just In February" (Lloren Foster)
Ebony Chamber Music: Transcending Black Culture through Black Music African American artists have had the challenge of liberating and redeeming the essence of a culture that has evolved and thrived despite the problematic features of being Black in America. This mission includes negating the misconceptions about Blacks that were produced by bigotry, while giving expression to the realities of and varieties in the Black experience. African American music and culture has led to the appreciation and development of Jazz, which is one of the greatest contributions to American culture during the 20th century. Jazz provided artists and musicians whose talents and gifts elevated African American culture, despite White America's efforts to obscure the significance and beauty that is within Black Culture. Likewise, Jazz has had a vast influence on Black America, its forms of expression, and its sense of style.

**Mirck, Skyler** ": The Effect Of Educated Values Of Agricultural Lending And Their Actual Usage In Today's Markets" (Stephen King)
A vast majority of agricultural producers rely on lender approvals for farm loans. However, there are many factors which influence the likelihood of farm loan approval. This study is expected to identify the factors which affect approval of farm loans, and will be presented as a useful tool for both agricultural academia, and producers in and around south-central Kentucky and Northern Middle Tennessee. In this study, a survey will be utilized in an attempt to measure the relationship between commonly educated and exercised methods of farm loan approval processes, and the actual methods and values referenced to approve farm loans in "real world" scenario.

**Mitchell, Amanda** "The Otaku's Mecca: A Pilgrimage Of Nerds In Japan" (Kate Hudepohl)
There is a population of people that refer to themselves as otaku, which has come to mean someone who is a fan—to the point of adoration, in most cases—of Japanese media. For otaku, going to Japan is a journey of zealous force—almost a pilgrimage—to the Mecca of the otaku experience. I have undertaken an autoethnographic study that observed a few American otaku traveling in Japan. I recorded the events of each day and the behaviors that I and the otaku with me exhibited during these events. I attempted to pay special attention to the tensions between otaku subjects and specific aspects of Japanese culture they recognized from referential encounters in America. It is my hope that my analysis of our experiences can tell cultural studies about the nature of the otaku subculture and international relationships between culture groups.

**Mitchell, Logan; Polk, Jason;** "Hydrologic Budgeting Of Autogenic Recharge In Crumps Cave, Kentucky" (Christopher Groves)
We are studying underground water hydrochemistry within Crumps Cave, Kentucky through high-resolution monitoring. A challenge here is determining the size of the land area that contributes precipitation as recharge to our individual underground water monitoring points. Two new hydrologic

budgeting analyses were developed and implemented to estimate the recharge area contributing to Waterfall One within the cave, one over multiple individual storm events and another utilizing data in overlapping six-month periods. We measured and utilized 15 months of ten-minute resolution surface rainfall rates and flow rates for Waterfall One in the analyses, with evapotranspiration calculated and considered in the analyses for the six-month records. Results from the two independent methods suggest that the recharge area is about 10,000-20,000 $m^2$.

**Moad, Rachel; Walker, Emily; Emberton, Taylor; Hoover, Don; Arnett, Scott;** "The Effects Of An Ergonomic Device On Sagittal Plane Lower Extremity Motion During A Full Squat In ACL-repaired And Non-injured Females" (Scott Arnett)
Each year, 250,000 Americans experience events affecting the anterior cruciate ligament (ACL), with women four to six times more likely to incur an ACL injury than their male counterparts (Hewett et al., 2005). Knee Savers® (KS) are an ergonomic aid purported to lessen the risk of such injuries. While widely used, KS have not been tested to determine their effect on lower extremity kinematics. Female participants (n=20) with a history of ACL-repair (n=10) or non-injury (n=10) completed a deep squat with and without KS. Results from the study indicate no significant differences were found in sagittal plane lower extremity kinematics when squatting with and without KS. Thus, KS did not appear to influence lower extremity joint positions during the bottom phase of a deep squat, as purported.

**Modi, Tulsi; Paripelly, Rammohan;** "Molecular Level Interaction Of Human Fibroblast Growth Factor-1 (hfgf-1) With Anti-diabetic Drug" (Dr.Rajalingam Dakshinamurthy)
Fibroblast growth factors (FGFs) work as modulators of various cellular activities. Among the FGF family, human FGF-1 (hFGF-1) is a powerful angiogenic. Phloridzin, an anti-diabetic drug, functions on the membrane surface of nephrons. Structurally, phloridzin resembles heparin, and can mimic heparin and compete with it for FGF binding. In this study, we tried to investigate the structural interactions governing phloridzin-hFGF-1 interaction by monitoring its stability, conformation and binding affinity by equilibrium unfolding using steady state fluorescence and proteolytic digestion assay. Protein NMR was performed to locate the sites of interaction on hFGF-1 surface. From the interaction studies, it was found that hFGF-1 in presence of phloridzin showed an increase in thermal stability and increased resistance against trypsin digestion.

**Moore, Madison; Pereira, Nielsen;** "Teaching Engineering Design Using Steam Machines™" (Nielsen Pereira)
The purpose of this study was to evaluate the effectiveness of the STEAM Machines™ program in promoting interest in engineering and knowledge about engineering design. The STEAM Machines™ program integrates science, technology, engineering, arts, and math (STEAM) learning objectives using Rube Goldberg®-style contraptions. Fifteen students in a summer program for gifted students comprised the sample. A design-based methodological framework was implemented. Surveys, reflections, and design artifacts were collected and analyzed. Results indicate that the STEAM Machines™ curriculum promotes interest in STEM careers, high levels of enjoyment and interest in the class, and increased knowledge about engineering design. The STEAM Machines™ program can enhance the pipeline of STEAM-ready students and encourage students' pursuit of STEAM careers.

**Mortberg, Hope** "Conflicting Evidence: Examining Homer's Motives For Racially Charged Imagery" (Guy Jordan)
This research examines those works of Winslow Homer, which address sensitive matters of racial inequality and persecution during the Civil War and subsequent decades. This presentation draws upon secondary sources of literature by authors Peter Wood, Nicolai Cikovsky, & Albert Boime, and includes images of Homer's paintings via the Portland Museum of Art's website, and the Philips Collection's

website. In this analysis, evidence is presented contradicting the popular perception of Homer as wholly committed to defending equality, instead providing that Homer was more conflicted in his moral constitution regarding the propagation of racism and prejudice than his famous works allow us to recognize. By examining the political inconsistencies in his works, we see the complex attitudes of Civil War America toward its black citizens.

**Moses, Mychal-Drew; Jahan, Muhammad;** "Fabrication Of Quality Micro-features Using Micro Scale Electrical Discharge Machining" (Muhammad Jahan)
Micro electrical discharge machining (micro-EDM) is one of the most widely used processes for fabricating micro-features in different materials. Present study aims to machine different types of micro-features in brass using the micro-EDM process. A tungsten carbide tool electrode with negative polarity was used to machine micro-holes and micro-slots. The machining parameters were set at gap voltage of 60 V, capacitance of 1000 pF and tool rotational speed of 3500 rpm. The SEM images confirmed high quality micro-features with smooth surface finish and dimensional accuracy. The EDS analysis indicated a significant amount of carbon and oxygen migration to the surface of the micro-features from dielectric oil and tool electrode. Finally, micro patterning was done by writing letter “H” and “5 X 5 array” using blind and through micro-holes.

**Nale, Sarah** "Raising Law Enforcement Officers Awareness Of Traumatic Brain Injury Signs: A Training Module" (Jo Shackelford)
Law enforcement officers must often differentiate traumatic brain injury (TBI) signs from alcohol intoxication (AI) during encounters with TBI survivors, yet they receive little TBI training. Many signs of AI and TBI mimic one another, and distinguishing them under stressful conditions can be problematic for officers. The growing number of veterans returning from Iraq and Afghanistan with TBI increases the likelihood of unnecessary and unfortunate confrontations between TBI survivors and officers. We have developed an online TBI training module focused on identifying and differentiating TBI and AI signs, supported by video clips demonstrating TBI signs. This study examines the efficacy of the training module using a pre-test/post-test design. Subjects included 85 law enforcement officers from Kentucky agencies. The pre- and post-tests consisted of an encounter scenario and identification of AI and TBI signs. Results showed a statistically significant increase in total post-test scores.

**Nally, Mary** "Evolution Of The Library" (Laura Leach)
This research focuses on how the experience of reading books and the purpose of libraries have evolved in the past twenty years. The traditional need and purpose of libraries have deteriorated into using them for free web and computer access or e-readers. To mimic this evolution in the building, classical and deconstruction architecture was used. By merging the evolving experiences of the written word and these architectural styles, this twenty year evolution can be experienced through the expression of architecture. These concepts and emerging changes in the use of libraries and reading are applied to the design of a library located in Mount Vernon, Indiana because it will help support a decaying area.

**Nedvidek, Dan** "Evaluating The Effectiveness Of Regulatory Stormwater Monitoring Protocols On Groundwater Quality In Urbanized Karst Regions" (Jason Polk)
The City of Bowling Green, located in south-central Kentucky, is built on the Lost River Karst System, which has been used since the founding of the City for waste disposal. Lost River, an underground stream, flows from the south of the City through agricultural, commercial, industrial and residential land before surfacing at a site known as Lost River Rise and flowing into Jennings Creek and finally the Barren River. This study looked at input and output sites for three of these basins, with a focus being on the inputs provided by stormwater injection wells and the outputs being points that provide known connections to surface water bodies in the area. In addition to water quality data, survey data were

collected from environmental professionals in the karst regions of Kentucky in order to quantify the understanding of state regulations.

**Nguyen, Khoa** "Factors Affecting Emergency Department Wait Time" (David Beckworth)
Wait time at hospital emergency department has been attributed to multiple cross-sectional factors. The 2010 National Hospital Ambulatory Medical Care Survey provides a reliable data to evaluate the effects of patient acuity, mode of arrival, and crowding history on wait time to see a health care provider at the emergency room. Through multiple regressions with the mentioned variables, I found that wait time is shorter for two out of five triage levels which associate with higher acuity (-41 percentage points and –28 percentage points; 99% confidence level), and for visits that use ambulance (-50 percentage points). The emergency departments that have a more crowded history are observed to have a significant longer wait time (46 percentage points).

**Normanha, Cae** "The Waiting Room" (Laurin Notheisen)
The idea for a series of collagraph and digital prints came to me from a song by the band Fugazi called the "Waiting Room." This series features illustrated couches and chairs floating in space framed in minimalistic backgrounds. Pastel color schemes were chosen to be inviting. The textures of the collagraph plates create tactile dimensions. Each print suggests a different environment to evoke varying emotions in the viewer. Only the viewer can attribute meaning to each "waiting room" depicted. My intent is to connect the viewer to places of anticipation, real or imagined.

**Nwosu, Usonwanne; Taylor, Ritchie; Michimi, Akihiko;** "Association Between Fluoride In Drinking Water and Dental Caries of Children In South Central Kentucky" (Ritchie Taylor)
A study was conducted in South Central Kentucky to evaluate the association between fluoride concentrations in drinking water and the occurrence of dental caries in children. Data for dental caries in children were obtained from the Institute for Rural Health at WKU. These data were collected from 2006 through 2011 as part of the dental sealant program for a ten county area, including Allen, Barren, Butler, Edmonson, Hart, Jefferson, McCreary, Simpson, Todd, and Warren counties. Fluoride concentrations in drinking water were obtained from the Kentucky Division of Water, Drinking Water Watch database, for water systems in the study counties. A statistical comparison was made using the Chi-square test to determine if an association existed between dental caries and fluoride levels in drinking water. A lower occurrence of dental caries was observed among children whose drinking water supply had fluoride levels similar to the CDC recommended optimal level of 0.7 mg/l.

**Oates, Elizabeth; Rinehart, Claire; King, Rodney;** "Discovery And Analysis of Arthrobacter Phage Mudcat" (Claire Rinehart)
Bacteriophages are the most abundant biological entities in existence, exhibiting extraordinary genetic diversity and playing an essential role in the evolution of bacteria. The purpose of this project was to expand current knowledge of the diversity in the arthrobacter bacteriophage population by isolating and characterizing novel bacteriophages from the environment that use Arthrobacter as a host. The bacteriophage Mudcat was isolated from a soil sample collected from the Green River in Central City, Kentucky. The virus' genomic DNA was purified and analyzed using DNA restriction analysis and gel electrophoresis, and its morphology was determined by electron microscopy. Mudcat's elongated, hexagonal-shaped head and noticeably long tail are uncommon when compared to the morphologies of other bacteriophage. The DNA was sequenced.

**Oberhausen, Caitlynn** "The Truth About Type 1 Diabetes-The Myths Exposed" (Margaret Cook-Newell)
Children with type 1 diabetes, T1DM, live with a widely misunderstood, chronic disease. The daily management regimens and psychosocial aspect of TIDM bring attention to the child with diabetes.

Myths and misconceptions of diabetes management abound. The intent of this research is to address myths and misconceptions by reading a children's book I wrote and illustrated to students in grades 3-5 and measuring change in knowledge with an assessment tool based on book content.

**Oldham, Alexandra** "Perceptions About Competition: A Comparison Of Self-report Data And Competitive Performance" (Steven Wininger)
The purpose of this study was to examine how much variance self-report measures of competition accounted for with regard to participant's performance on a series of performance tasks in mathematics, verbal reasoning, and handgrip endurance. Participants completed a series of self-report measures on competition. For each performance task participants completed a practice trial, were asked to make self-efficacy judgments, and completed the actual task. Participants were incentivized via chances for gift cards s based on task performance. Preliminary multiple regression analyses revealed a significant model for predicting performance on the handgrip endurance task. Additionally, mathematics self-efficacy was able to predict math performance. Further results will be presented at the conference.

**Osterhaus, Patrick** "• In Silico Prediction Of 3d Models For Mycobacteriophage Structural Proteins" (Claire A. Rinehart)
Cryo-electron microscopy (CEM) has elucidated one mycobacteriophage capsid structure to a resolution of 24 Å. Further refinement of the structures can be done either by X-ray crystallography (resolution: 2-5 Å) or by predictive in silico methods. Phage structural gene comparisons can be done before and after refinement, to create a common 3D model structure of phage components. At electron microscopy (EM) resolution, 3D structure can be viewed holistically, but not effectively compared. The genome sequence and EM image of over 600 phages are known. Development of in silico methods allows for structural comparison, to avoid unnecessary costs of empirical X-ray crystallography. Structural in silico predictions were made of phages using I-TASSER and Robetta. Structural phage proteins were predictively folded and mapped to the CEM dimensions.

**Osterhoudt, Laura; Groves, Chris; Polk, Jason; McClanahan, Kegan;** "Geochemistry And Carbonate Mineral Interactions In The Upper Green River Basin, Kentucky" (Chris Groves)
Understanding the human-induced flux of CO2 into the atmosphere and impacts on climate and environmental chemistry require a better evaluation of CO2 sources and sinks. Weathering of carbonate minerals consumes CO2, which ends up as dissolved bicarbonate. We are studying geochemistry and carbon fluxes within the Upper Green River, comparing the watershed upstream from Greensburg with mixed sedimentary lithology from Munfordville, downstream with extensive exposures of relatively pure limestone. The river at the downstream site has been more strongly influenced by carbonate mineral dissolution, with highly buffered conditions typically reflected in higher ionic strength and pH. Diurnal, photosynthetic pH variations are damped out downstream suggesting interactions between geologic and biological influences on river chemistry.

**Page, Christopher** "Soul Business" (Terry Shoemaker)
Traditionally, African-American churches have been one of the earliest and most recognizable institutions in African-American communities. In addition to saving the souls of thousands of people, it is involved in support for African American homes as well as social change in America. Today, in light of America's weak economy, many African Americans question whether black churches can continue to be a social repository. The growing concerns about the expanding wealth inequality, mass incarceration, and unemployment among blacks are central to the sustainability of African American churches. Therefore, due to a lack of individual resources, African American churches need to serve as the cornerstone for these social, political, and economical challenges. In addressing these issues, African American churches must rethink their previously held concerns about capitalism, then reinvent their currently held positions regarding charity, which will revive the role of African American churches.

**Palmer, Jahi; Palmquist, Shane; Kintzel, Edward; Andrew, Keith;** "Cementicious Matrix Structure At The Basalt Fiber Fracture Point" (Edward Kintzel)
Specialty fibers can be added to a cementicious matrix in an effort to alter the mechanical properties of the material. The resulting material can be more durable, flexible, less permeable and have a lower incidence of crack development when certain fibers are added to the original matrix. Here we examine the effects of special basalt microfibers added in different proportions to a concrete matrix and examine failure rates for time dependent induced stress. For various mixing ratios we find that the strain depends upon the mixture and exhibits an overall change in early crack formation. The failure occurs in a step pattern where cracks form followed by a region of quasi-stability which then changes as the stain on the material increases. This pattern of failure is clearly identified in the empirical plots showing the time dependent failure as a step like function and we compare the total strain values to the fiber free material.

**Pape, Richard; Emberton, Adam; Larin, Alexander; Dobrokhotov, Vladimir;** "Highly-integrated Wireless Sensor Networks" (Vladimir Dobrokhotov)
We developed a distributed network of energy efficient, wireless sensors for detection, position location, and tracking of asymmetric explosive threats. The network allows for easy deployment, stealth surveillance operation, and flexible integration of wireless sensors or devices. Its detection and reporting architecture is supplied with automated data fusion, intelligent data analysis and decision making algorithms. A novel integrated sensor "electronic nose" for trace detection of explosives, developed at the Applied Physics Institute (API), is utilized as a basic element of our sensor network. Such an approach will allow the real time spatial monitoring of signatures of interest within the covered area / perimeter, chemical traces mapping, and threat location and tracking. We believe that the outcome of this project will sufficiently help to eliminate a variety of asymmetric explosive threats and to save thousands of lives.

**Payne, Jason; Paripelly, Rammohan;** "Phloridzin Gold Nanoparticles – An Attempt To Regain Its Lost Charm" (Rajalingam Dakshinamurthy)
Diabetes is one of the common metabolic disorders characterized by an increase in blood glucose levels in the body. Lately, phloridzin which was once widely used as antidiabetic drug had to take an exit from the pharmaceutical market due to its side effects and poor bioavailability when compared to other competitors. Here, we have tried to overcome the drawbacks by designing a formulation which requires fewer doses by enabling site targetability. The formulation recipe includes phloridzin capped onto gold nanoparticles (phl-GNPs) by a single step green process. We hypothesize that the combination of phl-GNPs could improve the pharmacokinetics of phlordizin, thereby regaining its lost charm. The study involved synthesis of phl-GNPs using a single step process followed by its characterization using TEM, SEM-EDS, FTIR and UV-Vis spectroscopy.

**Pender, Lyndsey** "Exploring Cultural Heritage Through The C.H. Nash Museum At Chucaliss" (Kate Hudepohl)
The C.H. Nash Museum in Memphis, Tennessee, has worked towards a mission of integrating itself into the surrounding predominantly black community using applied anthropological and archaeological concepts. The museum works towards this goal through programs that focus on incorporating community members as partners and stakeholders in the creation and cultural preservation process. Over the summer, I was given the opportunity to take part in the African American Cultural Heritage in Southwest Memphis Project. I took the information displayed at the museum and created a website. Meetings with community members were held to decide on the information to be hosted on the website, as well as to solicit videos, pictures, and history. Community members recommended people to interview, and further information to collect, as the project grows. The project will continue during the summer of 2014.

**Perry, Michael; Bucklew, Timothy; Brown, Hal; Porter, Cole; Schmaltz, Kevin;** "Improving Efficiency Through Automation" (Kevin Schmaltz)
A local aluminum manufacturing company asked WKU Mechanical Engineering to investigate methods of applying protective aluminum tape to the sharp edges of aluminum cylinders, called Alu-cores that are used to ship rolls of aluminum to their customers. The Alu-cores come in multiple diameters and lengths, and this safety taping is currently done manually. The feasibility of automating this process to hold and rotate each Alu-core, while applying tape to both end of the cores simultaneously is being investigated by a ME senior project team, working with engineers and operators of the facility. An adjustable table has been designed and constructed to hold and spin the Alu-cores. A taping system that moves in the vertical plane has been designed, constructed and tested to apply the tape to the Alu-core reducing the current manual interaction.

**Phillips, Briana; Wichman, Aaron;** "Uncertainty, Political Conservatism, And Compensatory Conviction" (Aaron Wichman)
Uncertainty can cause people to show greater conviction in their social attitudes. The present research investigated the impact of different types of uncertainty, as well as the influence of political conservatism, on this effect. Results indicate that certain types of uncertainty may differentially affect individuals based on their political ideology.

**Pierson, Emelia** "The Relationship Between Athletics And Architecture" (Laura Leach)
The purpose of this research is to expose how athletes and athletic facilities influence each other. Team athletics are all about camaraderie, depending on others, and working together to achieve goals. A great athletic facility fosters that mentality as well as reflects that mentality in its architecture. This research also delves deeper into what makes an athletic facility successful, what does not, and how it can affect the mentality of an athlete. All of this information is applied to the design of a facility in Bowling Green.

**Pinkston, Renee** "Frog Legs, Pigs Feet, And Hogs Brains: Categories Of What We Eat And Don't Eat In The South" (Ann Ferrell)
In this paper, I examine traditional foodways of the South, specifically rural Kentucky, using a folkloristic lens. Foodways are a central aspect of folk culture and are often a very prominent marker of identity. Many people in this region are raised to be familiar with and accustomed to foodways that, when presented to outsiders, often initiate a reaction of disgust, distaste, and dislike. Often, these reactions overlap and extend into beliefs, stereotypes, and stigma of people based on what they eat. This paper will explore these "disgusting" or "distasteful" foodways and what they contribute to stigmas and stereotypes placed on those who practice these foodways.

**Polson, Shania; Richmond, Thomas;** "Efficient Paths Through Obstacles" (Thomas Richmond)
The goal is to find the optimal path between two points—A = (0,1) and B = (1,0). A square obstacle (with sides measuring a, which is less than 1) changes the rate of travel. We discuss complications which arise when the obstacle interferes with the direct path from A to B, and present some results.

**Porter, Lindsey; Rice, Nancy; Rowland, Naomi;** "Allelic Variability In The Angiotensin Converting Enzyme Polymorphism Ace I/d In An East African Population" (Nancy Rice)
Non-communicable disease, particularly cardiovascular disease, is a significant problem in developing countries. Essential hypertension (EH) is a leading risk factor for vascular disease. While managing EH in developing countries is a high global priority, few studies exist from third world populations. From a cohort of Kenyans living in the Kasigau region, we have investigated the allele frequency of a polymorphism reported to correlate with salt-sensitive EH. This polymorphism is an insertion/deletion (I/D) variant found in the gene encoding for the angiotensin converting enzyme gene (ACE), part of the

renin-angiotensin system. For this study, genomic DNA was amplified by PCR using OneTaq Master Mix and primers flanking the insertion site. Allelic discrimination was determined by differences in molecular weight of the amplified products, 490 bp versus 190 bp, respectively, as determined by 2% agarose gel electrophoresis. Genotype frequencies are currently being determined.

**Potter, Emily; Goodwin, Laura; Harbor, Karlos;** "Public Achievement: Coaching 21st Century Skills" (Elizabeth Gish)
The Public Achievement model was developed in 1990 at the University of Minnesota, and has since been spread to communities around the world. Public Achievement programs encourage young people to explore the concepts of citizenship and democracy, and to develop their skills as problem solvers, communicators, and collaborators. By discussing the process of coaching Public Achievement at the high school level and my experiences working with young people to develop meaningful public work projects, I will illustrate the importance of civic education for youth and the potential it holds to transform democratic life and possibility.

**Powell, Jayme** "New Frontiers: The Impact Of Technology On The Film Industry" (Jerod Hollyfield)
Title: New Frontiers: The Impact of Technology on the Film Industry Abstract submitted for Humanities at Western Kentucky University REACH Week Jayme Powell (jayme.powell1059@topper.wku.edu, (270) 535-3482) Mentor: Jerod Hollyfield (jerod.hollyfield@wku.edu, (270) 745- 3242) Technology has left a deep impact on how films are made and how audiences view them. Filmmakers face the reality that it is both a positive and a negative. While social media can be used to promote films, it also sends work into an endless pool of garbage. The question remains: Do the positives outweigh the negatives? In this paper I will examine both sides of the argument over the impact of technology on the film industry, with a focus on how beneficial it is to filmmakers. I will cite books and documentaries on the subject. This paper should take 20 minutes.

**Price, Carson; Heyworth, H.;** "Conducting Polymer Nanostructures And Nanocomposites: Hierarchical Assembly Via Molecular Electrochemistry And Property Characterization" (Sanju Gupta)
Conducting polymers are promising for preparing supramolecular nanostructures as present important electronic, electrochemical and photophysical properties that are useful as micro-actuators, electronic tongue, electrochromic displays and anti-corrosion coatings. We synthesize nanostructures of polypyrrole (PPy) and poylaniline (PANI) in an electrochemical cell via electropolymerization (i.e. anodic oxidation / p-doping) in potentiodynamic, potentistatic and galvanostatic modes. We present our findings from the viewpoint of molecular electrochemistry concerning the mechanistic details (initially forming dimers and oligomers as nucleating agents followed by growth in polymers) as they play a decisive role in determining the quality. These novel nanomaterials are characterized to establish microscopic structure-property correlations.

**Price, Kathryn; King, Rodney; Rinehart, Claire;** "Isolation And Characterization Of Gansey, A New Member Of The Cluster K Mycobacteriophages" (Rodney King)
Bacteriophages are viruses that infect bacteria and they can be found anywhere a suitable host exists. The purpose of this research was to gain insight into the diversity of the bacteriophage population by isolating and characterizing new bacteriophages from the environment. Mycobacteriophage Gansey was isolated from a soil sample collected from Hodgenville, Kentucky. Gansey's morphology was viewed by electron microscopy, and preliminary information about its DNA sequence was determined by restriction analysis and gel electrophoresis. Gansey phage particles have a 162.4 nm non-contractile tail and a 37.6 nm icosahedral head and the DNA restriction analysis suggested that Gansey belongs to the K1 sub-cluster of mycobacteriophages. The complete DNA sequence of Gansey's genome was recently completed and verified this result.

**Prince, Seth; Tinker, Darren; Clark, Caitlyn; Lenoir, Joel;** "An Analysis Of Thermoplastic Material Properties Of A Stratasys Dimension Elite Rapid Prototyping Machine" (Joel Lenoir)
Given that rapid prototyping machines are becoming more readily used in research and educational institutions, understanding the material properties of the extruded thermoplastic is paramount for efficiently printing safe and reliable parts. This research project is being conducted to collect useful data needed to determine the material properties of the various types of thermoplastics used by a Stratasys Dimension Elite rapid prototyping machine found within our university's lab. Furthermore, this research helps to define the material property differences that are created due to the orientation and density that the thermoplastic is extruded. Samples were created using standards as set forth by the ASTM document designated D638-03 for the creation of a Type I specimen.

**Prochazka, Tyler** "The World In Transition: A Comparative Analysis Of Youth Perceptions In China & America" (Soleiman Kiasatpour)
This thesis compares perceptions among American and Chinese youth regarding the future global roles of each respective country. Data was collected through online surveys and focus groups in China and America. Preliminary results show that American youth are reluctant to intervene in other state's affairs and that they are disinterested in sacrificing civil liberties for the sake of national security. Chinese participants thought China should increase involvement in multilateral organizations, and overwhelmingly rejected sacrificing civil liberties for greater security. During focus groups, Chinese youth often spoke glowingly of American ideals, but rejected US foreign policy. The results indicate there is significant overlap over ideals and goals between US and Chinese youth and this generation will likely trigger policy shifts over time.

**Prosser, Emily** "Self-advertising Through Social Media" (Matt Tullis)
Self-Advertising through Social Media Emily Prosser The intent for this project was to take an image of a well-known figure in society and combine that with some elements of digital and fine art to create a promotional design. I researched Shepard Fairey, who used a similar process to create the famous Barack Obama "HOPE" design, to help inspire my own design. The raw materials and final project can be found on several social media sites. By doing so, I can help promote myself as a designer as well as getting feedback on my work. I plan to present the following materials at the 44th WKU Student Research Conference: the raw materials used to build my graphic, final printed promotional materials, and a flow chart outlining predications and final results of online reaction to my design.

**Puckett, Nathan** "Determining The Organic Composition Of KYROCK By Use Of Toluene And N-pentane" (Cathleen Webb)
In the 1800s, KYROCK was a major natural resource that was used to pave roads throughout the country. Around 1850, it began to be replaced by asphalt for paving. Now all major roadways are paved by use of asphalt entirely. KYROCK is composed of a complex mixture of inorganic and organic compounds. Specifically, the organic fraction will be compared to the organic composition of asphalt. Samples of KYROCK will be characterized by LC-MS, GC-MS, and TGA to determine KYROCK properties. Samples of KYROCK will undergo organic extraction to elucidate various organic species. NMR analysis will be completed. The final results should shine some light on the replacement of KYROCK by asphalt.

**Rabold, Robert** "Lawrence V Bowling Green Board Of Education And Desegregation In Bowling Green, Kentucky" (Patricia Minter)
This project analyzes the desegregation of the City of Bowling Green, Kentucky in order to gain a deeper understanding of the historical context and development of the Civil Rights Movement nationwide. Although Brown v Board of Education of Topeka, Kansas declared segregation deprived

minority groups of equality in 1954, the desegregation of Bowling Green City Schools did not come until the 1960s. My work studies the case that ended segregated schools in 1963: Willie Larry Lawrence, et. al. v Bowling Green, Kentucky Board of Education. Analysis of relevant legal documents, news media, and societal reactions to Lawrence in Bowling Green enables a greater understanding of the story of desegregation in South Central Kentucky.

**Raley, Jeremy** "Continued Struggle Of Minority Filmmakers" (Jerod Hollyfield)
The continuing poor performance of the economy limits diversity in the film industry. The production of narrative films directed by minorities will continue to struggle in the foreseeable future, due to the film industry being predominately white. Studio executives are predominately male Caucasians that come from better socioeconomic backgrounds, and even the Academy is 94% Caucasian. The film business remains the nearly exclusive realm of the privileged. In my presentation, I will show that, though the year 2013 was a win for minority filmmakers, funding and distribution will continue to be pose a threat as in years past. I will also show how the election of President Obama has had little effect on the film industry, as some argue that his race and presidential status has ushered in a new era for Africa American cinema.

**Ralston, Kelli** "Perceptions And Memories Of Tiananmen Square 1989" (Patricia Minter)
The memory of the Tiananmen Square Massacre of 1989 presents varying degrees of historical awareness in the United States and in China. My study of news reports, personal accounts, editorials, images, and declarations all show how this diverse set of perceptions and memories was shaped, both then and now. A comparative study between the American and Chinese perspective also shows the deeper political and cultural influences that have either maintained or erode the historical memory of the massacre. While the American reaction of the massacre paralleled the reaction of the Chinese protesters in 1989, the Chinese government's reaction to the incident diverges. The Chinese government's version has swayed the current Chinese popular memory of the Tiananmen Square Massacre.

**Ramadan, Omar** "The Effects of Using Social Media Tools in Project Management" (Ahmed Khalafallah)
Internet plays an important role in our daily life and it has a great potential to effectively improve project management. This research paper investigates how social media can impact project management, and how project managers and project staff can use these tools to improve the efficiency of delivering projects. Using these tools enable project participants to share new insights, identify challenges, and enable effective communications to solve some issues rapidly with little cost. The study also investigates if these tools could increase the productivity of the project manager. Evidence will be sought to prove or disprove if the functions of these tools could efficiently improve project management by increasing productivity, saving time, and reducing costs. This includes surveying project managers through questionnaires on their evaluation of the efficiency of these tool.

**Randall, Allison** "The Fitting Of Assistive Ambulation Devices Of Residents From Assisted Living Facilities" (Scott Lyons)
This study was designed to raise awareness of the importance of a properly adjusted ambulatory device. Studies show that walkers and canes that are not adjusted properly could actually increase the risk of falls. Residents from two different assisted living facilities, who used a cane or walker, were asked to participate. With consent, their devices were inspected for faulty parts, and then examined for proper fit. Results revealed that over 50% of the 23 participants had an ambulation device in the "needs improvement" group as opposed to the "properly fitted" group. Information obtained included the type of device, how long they had the device, the origin of the device, and if they thought the walker or cane fit. Studies like this are significant because falls in the elderly can result in serious injury and may even be fatal.

**Reesor, Jesse; Tinker, Darren; Lancaster, Zach; Reesor, Jesse; Lenoir, Joel;** "Quadrotor Reconnaissance Of The Sinkhole At The Corvette Museum" (Joel Lenoir)
Recently, tragedy struck at the Corvette Museum and eight beautiful cars were swallowed by the ground below. Western Kentucky University's Engineering department was quick to respond sending Civil and Mechanical Engineers to help assist and assess the damage. Four Mechanical Engineering students deployed their research project in a real world scenario and recorded valuable footage that would have required significant risk of human lives to attain. The following is an explanation of the research projects leading to the event, the quick response to reach the sinkhole, and conclusions of our team's efforts.

**Richardson, Michael** "Real Life Awaits: Changing Views Of Culture And Society As Expressed In The Holy Mountain And Spring Breakers" (Jerod Hollyfield)
Alejandro Jodorowsky's 1973 film The Holy Mountain advised audiences as a society to escape what was becoming a homogenized, desensitized culture. 39 years later Harmony Korine released Spring Breakers, a film immersed in the culture Jodorowsky warned about, now fully mature. With the line between reality and its portrayal by the media erased, Korine presents a society created by this culture of violence and amorality from which there is no escape. Through hyperbole and fantastic visuals, both directors paint absurdist portraits of their societies to comment on the values of each. I will analyze Korine's and Jodorowsky's views of society and put each film into its historical context, to determine what changed pop culture into an all-permeating fixture, and if Jodorowsky's declaration that "real life awaits" is even tenable.

**Richmond, Valerie; Nee, Matthew;** "Spectral Exploration Of Nitrate Ion Symmetry-breaking In Aqueous Solution" (Matthew Nee)
The abundant nitrate ion (NO3-) is associated with climate-changing gases. Its molecular symmetry distortion plays a central role in the light-triggered reactions of nitrate. Using temperature-dependent molecular vibrational motions, we can understand the relative energies of nitrate's two main solvation patterns. We show that a solution's ionic concentration affects the stability. Symmetry-breaking is used as an insight into the molecular environment of the aqueous solution, allowing further exploration of molecular solvation geometries. High ionic concentration can be found in salt deposits, soil, wastewater, and nitrifying bacteria. These investigations may result in a novel way of evaluating nitrate photochemistry using electric charges.

**Riggle, Matthew** "A Tale Of Three Cities: Infrastructural Influences On Diverse Metropolitan Areas" (Kelly Reames)
A strong infrastructure is a necessity for every city to effectively manage its residents. Often overlooked, however, is the role that the infrastructural network plays in the development of a city's unique cultural identity. The differences among the transportation networks and arrangement of buildings have a profound effect on the distinguishing characteristics between different cities. My paper examines the effects of infrastructure in shaping the culture of metropolitan areas, and does so by exploring a fundamental unit of infrastructure—the neighborhood—in New York City, Tokyo, and Rio de Janeiro. These three case studies highlight the infrastructural contrasts that arise from different economic circumstances and developmental conditions, and represent a variety of cultural backgrounds and identities from across the globe.

**Riley, Benjamin** "Temperatures and Densities of Planetary Nebulae From Optical Spectra" (Ting-Hui Lee)
We present preliminary results from an optical spectroscopic survey of compact planetary nebulae (PNe) in the Galactic disk. PNe are the envelopes ejected by Sun-like stars near the end of their lives. This is an ongoing optical+infrared spectral survey of 150 compact PNe to build a complete database of PN

chemical abundances in the Galactic disk. We obtained optical spectra of 14 PNe with the Southern Astrophysical Research (SOAR) Telescope in September 2012. The flux intensities of the emission lines H-alpha, H-beta, OIII, NII, SII, and ArIV are measured and reddening corrected. Here we present the physical diagnostics such as electron temperature and density for each PN derived from the reddening-corrected line intensities. We will use these diagnostics to derive the elemental abundance of He, N, O Ne, S and Ar in subsequent analyses

**Ritchie, Meaghan** "Using Technology to Self-monitor for Students with Emotional and Behavioral Disorders" (Wanda Chandler)
The purpose of this research poster is to discuss the benefits of behavior self-monitoring of students with emotional and behavioral disorders (EBD) when aided by technology. Students with disabilities can have a difficult time when being included in the general education classroom, especially those with EBD. Self-monitoring is an evidence-based practice that has been effective in improving behavior of students when employed with technology for data collection. When combined, successful transition outcomes increased for students with EBD.

**Rodgers, Hannah; Paripelly, Rammohan; Dakshinamurthy, Rajalingam;** "Single Step, Antibiotic Mediated Synthesis Of Gold Nanoparticles With Potent Antimicrobial Activity" (Rajalingam Dakshinamurthy)
There is an immense need for new strategies to design super powerful antibacterial agents against MDR bacteria. Gentamicin was coated directly onto GNPs (Gent-GNPs). The GNPs were characterized using TEM, UV/Vis spectrophotometer, SEM-EDS, FTIR analysis, and the amount of gentamicin attached to the surface of the GNP was determined using TGA. Different antibacterial tests such as bacterial growth assay and spread plate assay were carried out on both Gram-positive and Gram-negative bacteria to determine the MIC of GNPs. The results are promising since the minimum concentration of GNPs required for inhibition of bacteria was less compared to the free gentamicin. Future studies involve in vivo activity of Gent-GNPs in infected animals and proteomic analysis on Gent-GNPs treated bacteria.

**Rodriguez, Randy** "Integrating Design Into The Community" (Laura Leach)
The driving force behind designing an indoor soccer complex is to emphasize the importance of soccer and to showcase the passion that players in this community have. Pele once said “Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing or learning to do” (Lippincott, 1978). Researcher was conducted on sustainability, design requirements of a soccer field, interaction of space, and through personal interview. The research that was investigated will be the driving force in designing a facility that will give an overall idea of how consciences designing can affect the community.

**Rogers, Jonathan; Faulk, Heath; Tinker, Darren; Lenoir, Joel;** "Design Of A Precision And Accuracy Test Stand For Varying Firearms: A Capstone Project" (Joel Lenoir)
An integral characteristic of any given firearm is “accuracy.” The actual meaning often is closer to the engineering definition of precision – how tightly bullets group together. Three engineering students at Western Kentucky University have redesigned and improved a test stand minimizing human interaction, eliminating undesired degrees of freedom, and allowing Remington to reliably and repeatedly quantify a given weapon’s precision. The following documentation provides explanation of our team’s analysis of the previous fixture and the design process leading to our current model.

**Roka, Ranjana; Michimi, Akihiko; Macy, Gretchen;** "Associations Between Hypertension, Body Mass Index, and Waist Circumference in U.S. Adults: A Comparative Analysis by Gender" (Akihiko Michimi)
Generalized obesity (body mass index (BMI)) and abdominal obesity (waist circumference (WC)) are

factors of hypertension, but their potentially multiplicative effect on hypertension is underexplored. This study investigates the association between hypertension and these two obesity measures and modifying effects among U.S. adult population using 2009-2010 NHANES stratified by gender. Logistic regression was used. Interaction terms were added in each gender model to examine if BMI modified the effect of WC on hypertension. Results indicated that both BMI and WC were associated with hypertension. The interaction terms explained that the effect of BMI on hypertension was stronger among overweight/ obese males. This effect, however, was not present among females. BMI and WC may influence hypertension differently among males and females.

**Romano, Nicole** "Different Wonderlands" (Jerod Hollyfield)
The definition of film adaptation, has been widely debated throughout film studies history. Scholars such as Linda Hutcheon, Christine Geraghty and many others have given us specific ways and ideas of defining adaptation and individually how key iconic figures are used to be considered an adaptation. In my paper I am going to compare and contrast as well as define what type of adaptation Tim Burton's "Alice in Wonderland" would be considered. My paper will address specific iconic figures that are kept and changed from the source text, using Lewis Carroll's "Alice's Adventures in Wonderland, as well as Carroll's "Through the Looking-Glass and What Alice Found There." Also my paper will explore specific changes in tone, characters, and dialogue that are found within Burton's film. In conclusion this paper by closely investigating Burton's film will give an aspect of defining adaptation as well as clearly showing us how this can be considered an adaptation.

**Rose, Dale** "Eugenics And Communal Housing In La Mission De L'esprit Saint: An Ethnography Of A Quebecois Denomination" (Michael Williams)
Eugenics and Communal Housing in La Mission De L'Esprit Saint: An Ethnography of a Quebecois Denomination Dell J. Rose delljospehrose@gmail.com/ 423-217-8879 Subject Area: Humanities Faculty Advisors: Dr. Michael Ann Williams, and Dr. Erika Brady Equipment Needed: Computer with PowerPoint, and a Projector Abstract: The intentions of this project are to present an ethnography of a little known Quebecois religious movement and to showcase how the group strengthens itself internally against the pressures of a hostile political environment. Special focus will be in showcasing how the theology of this group emerges from the theoretical and philosophical into the concrete expression that is found in the rituals surrounding Eugenics and Communal Housing. The study of this group will add to larger understanding of the social reinforcement stimulated by religion.

**Ruggles, Hannah** "How Are Hospitals Reducing Readmission Rates" (Dana Bradley)
Under the Affordable Care Act hospitals have been mandated to reduce readmission rates for Medicare beneficiaries or face monetary penalties if they do not meet the national averages. Hospitals across the country are enacting programs to meet this demand. A review of the literature suggests that the communication between medical care providers and the patient is crucial in creating a positive outcome for the patient. The discharge staff is responsible for providing the patient with information regarding their continued care outside of the hospital setting. The purpose of this research is to gather insight on one strategy being utilized by discharge staff called the "teach back" method. Preliminary data shows that this method has been successful in reducing readmission rates.

**Runyon, John** "Multi-rotor Octocopter Design For Interactive Virtual Engineering Applications" (Joel Lenoir)
With Virtual Reality capabilities steadily increasing, it's application in the enhancement of virtual engineering projects is developing as well.One such facet of this field includes utilizing aerial photography for virtual modeling and reconstructions of buildings. However, while the engineering department has extensive capabilities in quadcopter technology, these are too small for the anticipated

payloads.As such, it was determined that designing and building a custom multirotor in the form of an OctoCopter would allow us to achieve the capability of handling the larger payloads whilst maintaining the stability and precise control required to capture high quality, high-resolution film with the camera systems on board. After extensive research and designing, we have begun construction of a multi-rotor able to readily meet these criteria.

**Ryumae, Rena; Kottyan, Leah; Harley, John;** "The Association Of A Variant In The Irf7 Locus In Systemic Lupus Erythematosus (sle)" (Derick Strode)
Systemic lupus erythematosus (SLE) is an autoimmune disorder. Previous genome-wide association studies show that IRF7, a transcriptional factor playing a crucial role in immune responses against viruses, is one of over 40 susceptibility loci for SLE risk. We genotyped polymorphic genetic variants in 4 ancestries (14,122 cases/ 9,390 controls). Using PLINK, a statistical program, to identify allele frequencies in SLE cases/controls, SNPs were found to be associated in all cohorts. Rs1131665, an amino-acid changing SNP, can affect the affinity of the IRF7 DNA binding domain, explaining most of the genetic variation in the IRF7 region, using step-wise logistic regression. Results indicate that non-synonymous SNP rs1131665 is a likely causal variant whose biological consequences drive the statistical association of SNPs in IRF7 with SLE risk.

**Sadrinia, Cyrus** "Inflammatory Response In Mice Exposed To Nanotitania (tio2nps)" (Nilesh Sharma)
Consumer products containing significant amounts of Ti-nanoparticles include paints, toothpaste, colorants, cosmetics, sunscreens, medicine, and beverages. Ti is generally considered biologically inert, but Ti-nanoparticles were observed to cause significant toxicity in recent studies. In this study, lab mice were administered intraperitoneally TiO2 rutile crystals (30-50 nm) at the rate of 333 and 1332 mg/kg (body weight) at 0, 5 and 10 day during a 15-d period. After termination of the experiment, spleen extract and circulating blood were assayed for cytokines using ELISA. Elevated levels (p0.05) of inflammatory cytokines (TNF-alpha, IFN-gamma, IL-1alpha, IL-1beta and IL-6) were detected in spleen extracts, whereas significantly reduced levels of VEGF and Rantes were obtained from both spleen extract and blood, relative to control.

**Salihovic, Amer** "Plc" (Stacy Wilson)
POWR LINE COMMUNICATION By: Amer Salihovic With the world becoming more globalized and connected, the need for fast and reliable communication methods has never been higher. The main method of communicating ideas is network based and thus a reliable and cost efficient system is necessary. Power Line Communication can be used to deliver the necessary information through an existing and reliable infrastructure.

**Sams, David** "Sleep Deprivation Increases Cytokine Gene Expression And Plasma Corticosterone Levels In A Murine Model: A Possible Link Between Stress And Inflammation?" (Noah Ashley)
Sleep loss in humans has been linked to exaggerated inflammation. The mechanisms behind this pro-inflammatory phenotype are poorly understood. We hypothesized that sleep deprivation (SD) would increase inflammation in the periphery and brain, as well as stress hormones, using a mouse model. Adult male C57BL/6J mice were deprived of sleep for 0, 12, 24, or 48 hours using the multiple platform method. Gene expression of cytokines was measured in tissues using RT-PCR. Corticosterone in blood plasma was assessed using ELISA. After 24 hours of SD, IL1β and TNF expression was elevated in periphery and several brain regions. Corticosterone was elevated after 24 and 48 hours of SD, possibly mediating cytokine gene expression. This suggests a link between inflammation and the stress response from sleep deprivation.

**Scaff, Tyler** "Diagnosis In Medicine And Chess" (Wieb van der Meer)
The methods behind a medical diagnosis can be compared to the strategy of chess. When a player performs a fork maneuver, the opposing player must decide between losing one piece or losing another. A physician must also decide between one diagnosis or another, and even if both fit the insufficient information on the disease at hand, only one decision can lead to proper treatment. Often, both a chess player and a physician face situations in which they cannot predict the outcome of their next move and must decide between taking a risk and staying safe. When a physician performs a biopsy or other invasive diagnostic procedure, there is a chance of exacerbating the affliction. There is an inherent risk in these procedures, but often they are the key to knowing what afflicts the patient. Other comparisons in diagnosis and chess are drawn.

**Scisco, Logan** "Vanguard Of The Right: The Department Of Education Battle, 1978-1979" (Patricia Minter)
Satisfying a campaign pledge to the National Education Association (NEA), President Jimmy Carter pushed for a federal Department of Education in 1978 and 1979. In the ensuing legislative battle, Carter confronted opposition from states' rights, social, and religious conservatives who were beginning to form the nucleus of the New Right in the Republican Party. Using divisive racial and religious issues, these conservatives tried, and failed, to thwart the Department of Education project. Congressional testimony, the Carter administration's internal documents, and newspaper editorials illustrate that the Department of Education battle foreshadowed the Reagan Revolution of 1980.

**Seidler, Tessa; Schroeder, Amber;** "A Beautiful Mind: Examining The Effects Of Emotional Intelligence And Physical Attractiveness On Employee Evaluations" (Amber Schroeder)
The current study examines the effects of emotional intelligence, perceptions of physical attractiveness, and employment-related decision making. After completing a series of personality assessments, a cognitive ability test, and emotional intelligence (EI) assessment, participants evaluated several performance appraisals corresponding to several hypothetical employees. It is expected that a rater's level of EI will impact their ability to rate other individuals when age, gender, and physical attractiveness information is disclosed. As such, it is expected that raters with higher EI will be less biased in their ratings while those with low EI will be more susceptible to such influences. These findings may be beneficial to organizations, as previous research has demonstrated the influence of attractiveness and importance of EI within a variety of employment contexts (e.g., selection, performance evaluation, termination).

**Serpico, Jonathan** "Analysis Of Systematic Error In Parity Violating Proton Asymmetry In The 3he(n,p)t Reaction" (Ivan Novikov)
The 3He(n,p)T experiment in one of four experiments needed to provide information on hadronic weak interaction. The experiment is an ongoing effort at the SNS ORNL. The objective of the experiment is to measure parity violating (PV) spin-dependent proton asymmetry. We have conducted an analysis of systematic sources of error in the measurement of PV asymmetry due to neutron energy variations and depolarization in the beam. The neutron energy and polarization dependence of various observables was calculated in the framework of nuclear resonance reaction theory.

**Settles, Paige** "What Goes Up On The Internet Must Not Come Down: The Tweet Retraction Process Of Politicians" (Timothy Rich)
Past scholarship regarding Twitter has studied the impact of tweets candidates share with voters, but attention has not been afforded to tweets candidates delete. This paper delves further into the analysis of Twitter as a political campaign tool by examining the frequency with which politicians retract tweets and if demographic factors affect this retraction. The methodology analyzes deleted tweets of members

of the 112th congress between May and November 2012. By conducting quantitative analysis on demographic variables, this paper hopes to determine whether gender, party ID, and/or age have a relationship with the frequency of political tweet retraction, and if so, the strength of that relationship. The results this study yields suggest that age and party ID are not strong predictors of retraction, but gender may have a relationship.

**Shah, Heli** "Three-dimensional Architectural Visulization In The Digital Environment" (Shahnaz Aly)
The language of architecture is expressed in the drawings that are used to conceptualized structures. For students as well as professionals, three-dimensional representation is a vital part in the representation of their design. The intent of the FUSE grant was to experiment with different digital tools used for architectural visualization in the three-dimensional environment, to find out the techniques and methods available to create these graphics and to compare and contrast the outcomes. A Google SketchUp model was used as a base for the renderings. This poster will highlight the results of the study through a series of images that were generated during the study.

**Shah, Heli** "Integrating Art And Architecture To Create A Link Between Bowling Green And Wku" (Laura Leach)
The goal of this research project is to develop a luxury hotel for the Bowling Green downtown area adjacent to the Augenstein Alumni Center. The objective of the research was to create a sustainable luxury hotel that can reflect buildings on the WKU campus and downtown Bowling Green. Research was conducted on green aspects, sustainable products and materials, the Tax Increment Financing (TIF) district design guidelines, and the International Building Code (IBC). IBC research was important as a guide on occupant safety. TIF district guidelines and typology research was conducted to learn the restrictions on materials and design in that area so the characteristics of the hotel compliment that of the surrounding buildings. The research resulted in a sustainable building that fulfills its purpose and is suitable for the area.

**Shah, Monic** "Spectroscopy Confirmation For Encapsulation Of Antibiotic Onto Gold Nanoparticles" (Rajalingam Dakshinamurthy)
After designing and patenting one of the most unique method for making monodisperse gold nanoparticles capped with various antibiotics in a completely green and biofriendly process, the next major step was to characterize the synthesized antibiotic capped gold nanoparticles (Ab-GNPs). Morphological characteristics of GNPs can easily be determined using various microscopic techniques such as TEM, SEM-EDS etc. So far in literature, there is no direct technique which can help to authenticate the capping of antibiotic onto GNPs. To solve this myth, we have come up with a hypothesis to confirm the capping of antibiotic onto GNPs using UV-spectroscopy. The method involves monitoring the UV spectrum of Ab-GNPs at its characteristic wavelength prior and after treating it with β-lactamase enzyme which can confirm the presence of antibiotic.

**Shain, Lindsey** "Compulsive Cell Phone Use and History of Motor Vehicle Crashs" (Stephen O'Connor)
Motor vehicle crashes are the leading cause of death and injury for adolescents and young adults, and can often be traced to distracting behaviors such as in-vehicle cell phone use. Previous research suggests a compulsive mechanism underlying problematic cell phone use that may help explain the association between compulsive cell phone use and motor vehicle crashes. The current study builds upon previous research by investigating the association between cell phone overuse, clinical characteristics, and history of motor vehicle crash. Using Qualtrics survey software, WKU undergraduates were recruited to complete an online survey which includes measures of impulsivity, cell phone use, and history of motor vehicle crashes. We will conduct a series of regression models to investigate relationships between study variables.

**Sharma, Ananya; King, Rodney; Rinehart, Claire;** "Discovery And Genomic Comparison Of Bacteriophages Desigirl And Peeza" (Rodney King)
The objective of this project was to gain insight into the diversity of the bacteriophage population by isolating and characterizing new bacteriophages from the environment. Two soil samples from different environments in Kentucky were collected and enriched using the host Mycobacterium smegmatis. Bacteriophages 'DesiGirl' and 'Peeza' were isolated and purified to homogeneity. Transmission electron microscopy of phage stocks revealed similar morphologies consisting of icosahedral heads and non-contractile tails. However, restriction analysis of purified genomic DNA showed that these phages are genetically distinct. Based on this analysis, DesiGirl and Peeza were predicted to belong to the cluster A and cluster K phages respectively. Confirmation of the predicted cluster designation will require genomic DNA sequence analysis.

**Shelburne, Andrew** "Look Good, Play Good, Design Well" (Laura Leach)
Abstract Look Good, Play Good, Design Well The purpose of this project was to give Deuce Brand an innovative space that would unite their employees and athletes, and give them the opportunity to work in harmony to create the best athletic gear possible. In order to do this I had to do extensive research on the designs of office spaces depending on employment titles. Another major part of my research was to understand specifics about the design of indoor sports facilities. While designing the warehouse I had to consider controlling the flow of product, as well as organized storing techniques. A great deal of research went into passive solar design in order to conserve the building's energy. The true art of my research process was bringing individual spaces together to create one unified complex, and an overall well-designed workspace.

**Sherrill, Brenna** "The Wizarding Words Of J.k. Rowling: Literary Merit In The Harry Potter Series" (Molly McCaffrey)
Since hitting bookshelves in 1997, the Harry Potter series has taken the popular culture world by storm in an unprecedented way, breaking records for sales records for both books and films, and dramatically increasing readership among young readers. Despite its immense and unique success, this series, like many other examples of pop culture, doesn't often receive the credit it deserves with respect to its literary merits. However, with a detailed analysis, it is undeniable that the Potter books reflect many of the themes found in all great works of literature, including complex character development and abundant literary devices that elevate the intellectual level of the series. I will analyze these characteristics to discuss why the Potter series has literary merit and can be discussed in academic settings.

**Siegel, Virginia** "The Gardner House: Rehabilitating A Jewel Of Hart County" (Michael Ann Williams)
Amongst the diverse range of species found within the habitats of WKU's Green River Preserve, there also stands an architectural gem, reputed to be the oldest home in Hart County, Kentucky. This presentation will focus on the work of the Department of Folk Studies and Anthropology, which has been active in documenting and restoring the structure, the Gardner House, since 2003. The Gardner House is an early 19th century brick hall-and-parlor house listed on the National Register of Historic Places for its architectural significance. Students, with the generous help of volunteers, have spearheaded a variety of projects to improve the structure, however the work is not finished. I will detail past projects, projects I am currently supervising for my graduate assistantship, as well as my hopes for the future of this jewel of Hart County.

**Simms, Christian** "Determinants Of University Presidents' Compensation" (Johnny Chan)
The Determinants of University Presidents' Compensation This research examines the underlying factors contributing to the overall compensation of university presidents. Statistics was used to analyze ten different possible influences. For the selected presidents, we found the average salary to be

$490,802; also, the average number of years as president was about ten years. Gordon Gee of Ohio State University received the greatest compensation (over $1.5 million), while Jimmy Cheek of the University of Tennessee received the least compensation (approximately $167,000). A comprehensive analysis is underway. We anticipate that the results will be able to help universities fairly compensate their chief executives and offer information to job applicants regarding how their salaries would be determined.

**Siriyutwatana, Varavoot** "Green Synthesis Of Tetracycline Derivative Doxycycline Capped Gold Nanoparticles And Evaluation Of Its Antimicrobial Activity" (Dr.Rajalingam Dakshinamurthy)
Nowadays, bacteria are becoming resistant to available antibiotics. We report a single step biofriendly synthesis of doxycycline capped gold nanoparticles (D-GNPs). Effects of different parameters like solvent, temperature, reaction time on synthesis of D-GNPs were observed. Characterization was done by various analytical techniques like transmission electron microscope (TEM), ultraviolet-visible spectroscopy (UV-vis spectroscopy), SEM-EDS and FTIR. TEM study showed that the resulting GNPs were spherical with a size within 15-20 nm. UV-vis spectroscopy showed the characteristic absorbance peak at 550 nm. Elemental and surface analysis was carried out by SEM, EDS and FTIR. The next step of our study involves evaluation of antimicrobial properties. For this conventional assay like spread plate assay and turbidimetry assay along with modern assays like XTT and alamar blue assay will be used. It is through this study that the potential use of D-GNPs in medicine can be assessed.

**SISLER, HEIDI** "Free Practice, Guarded Profession: Identity Negotiation For Public University Professors" (JENNIFER MIZE SMITH)
Freedom of religion and separation of Church and State are two social beliefs that have impacted US policy for years. In the last few decades, these two social beliefs have taken center stage, particularly in the realm of education. Yet, the impact these social beliefs have on public teachers who identity as both religious and as education professionals has not been examined. This study conducted qualitative interviews with public university professors to see how they talked about and negotiated these identities on campus. Analysis of the data found two overall themes, that public university professors talk about their religious identity through their intinteractions with others and they more often negotiate their external environment when determining when to bring up their religious identity.

**Slocum, Brittany; Hollyfield, Jerod;** "Long Live The Queen: An Uncommon Phrase Of The 1980s' In Northern Ireland, Hunger, Steve Mcqueen" (Jerod Hollyfield)
About twenty-seven years after the heart of the Irish Republican Army's (IRA) movement towards the liberation of Ireland, including Northern Ireland, from England's control, the film Hunger came into fruition. Steve McQueen's debut film, Hunger (2008), magnifies the repercussions of conflict and the affects that it can take on an individual's consciousness and total being. This paper will analyze some aspects of human behavior in times of crisis (or "war"), specifically focusing on how each party handles and reacts to the other. This battle of wills lasted for about 12 years and came at the cost of over 2,000 lives, so it is reasonable to say this time period has become a model for human and political rights; this then creates a forum for talks between the political, religious, and human rights leaders of today.

**Slone, Katherine** "Ipads: Do They Help Teacher Instruction?" (Nielson Pereira)
The purpose of this study was to introduce iPads into the special education classrooms. Technology has always transformed the way people are educated. The abacus that made teaching math easier years ago and the word processor that changed the way research papers are written and presented. The World's technological progress has impacted education. Now, the iPad is being introduced into school systems and it is making great strides with special education students. iPads are proving to provide a wealth of possibilities for assistive technology with their brilliant graphics, audio and multi-touch interface. There are applications for the iPad that make a difference for special education students. Special education

teachers completed a surveys, introduced the iPads to their instruction and they kept a journal and reports on how the use of iPads affected their instruction. Results show that iPads can help improve the educational experiences of special education students.

**Smailhodzic, Armin; Andrew, Keith; Steinfelds, Eric; Zolman, Nickolas;** "String Gravity Mattig Relation For Cosmological Distances" (Keith Andrew)
A luminosity distance function to directly compute and compare distances from redshift observations is a requirement for any cosmological model. Here we look at a string theory motivated Gauss Bonnet cosmological model as a first order quantum correction to the Einstein field equations and use the radial geodesic equations to derive a nonlinear differential equation for photons on the light cone coming from a Blazar. We transform the radial geodesic equation into an integral equation that is the product of the extended Mattig result and a string correction term in the integrand. This equation can be expressed as an integral string correction with a variable substitution resulting in an explicit z dependence. The new equation is then expanded yielding a generalized Mattig Luminosity distance function for a string theory Gauss Bonnet cosmology.

**Smailhodzic, Armin; Andrew, Keith; womble, Philil; Hahn, Lance; Musser, Jason; Wright, Christopher; Almousily, Khaldoun;** "Critical Behavior Of Cyber Phase Structure On Hyperbolic Graphs From Arabic Twitter Data Files" (Keith Andrew)
We examine changes in the nodal graph from Twitter messages that are identified as phase change criticality on a hyperbolic metric space. Certain word patterns assemble into memes that occur with higher frequency in the Twitter stream near a change of life event. Here we express these streams as a partition function on a hyperbolic space and examine the parameter space that gives rise to an effective phase change. Our model is isomorphic to the simple Ising model that exhibits phase change as a function of temperature. In the Ising model even though the parameter change is everywhere smooth and differentiable, a second order phase transition occurs causing the system to spontaneously magnetize. In this context we examine Arabic language tweets and key word memes exchanged in the Middle East region from the Western Sahara and Morocco/Algiers to Djibouti, Qatar and Syria where dialects cover Bahrani, Omani, Rashaida, Shuwa, Sa'idi, Nubi and Badawi.

**Smith, Austin** "Sleep Deprivation Decreases Depressive Behavior In Mice: Does Sex Matter?" (Noah Ashley)
Depression occurs more in women than in men. Also, sleep deprivation in mice can alleviate depressive-like behavior. Knowing this, we predicted that female mice would show a larger decrease in depressive behavior than male mice after experimental sleep deprivation (SD). Male and female C57BL/6 mice (>8 weeks of age) were subjected to 24h of SD using the multiple platform method ($N = 16$) or allowed to sleep (control) ($N = 16$). Depressive behavior was then quantified using the forced swim test and the time spent immobile (floating in water) was a measure of negative mood. In agreement with past studies, SD alleviated depressive behavior ($p < .05$). However, contrary to our hypothesis, there were no sexual differences in depressive behavior after SD ($p = 0.32$). Future studies should examine what mechanisms cause SD to alleviate depression.

**Smith, Emily; Centers, Malissa; Stearns, Heather;** "Comprehensive Examination Preparation For Graduate Students In Speech-language Pathology" (Janice Smith)
This study focuses on preparation of graduate students in the WKU Communication Sciences and Disorders department to take a comprehensive exam (i.e. Praxis) in Fall 2014. Previously, students obtained information about the Praxis through outside resources and used personal study techniques to prepare, instead of relying on the faculty and staff. The purpose of this study is to gain information about how students' best learn in preparation for comprehensive exams such as the Praxis. The following

procedures will measure value of a pilot preparation program: individual completion of a demographic survey, pretest and posttest scores, and completion of six preparation sessions during the Spring 2014 semester. Only results from the demographic survey, pretest scores, and concluded preparation sessions will be presented at this time.

**Smith, Erik** "An Investigative Remote Sensing Analysis Of The 26 May 2013 Supercell Thunderstorm And Possible Tornado" (Joshua Durkee)
On 26 May 2013, a considerable strong supercell thunderstorm developed just to the northwest of Brewster, NE. The Western Kentucky University Field Methods in Weather Analysis and Forecasting class set out to forecast document this particular event. At the time of the event, all data communications were lost, and the group was forced to terminate the real-time analysis and evacuate. Given the remote location of the event, and no storm damage reports, this particular event went undocumented as a tornadic event. Upon reanalysis of level 2 radar data and GOES satellite imagery, evidence of strong rotation within the storm indicated that a possible tornadic circulation was present. The purpose of this study is to provide an investigative remote sensing analysis to try to determine if this particular storm produced an undocumented tornado.

**Smith, Kaitlynn** "Will You Buy My Movie? A Study Of The Films Purchased For Distribution At The Sundance Film Festival" (Ted Hovet)
The Sundance Film Festival provides an opportunity for independent filmmakers to sell their films to distribution companies. Through research of the festival's history and content analysis of the most popular films from the last twenty years, I argue that it has become too "Hollywood" and that the films purchased for distribution share characteristics. I will identify the attributes of the films through an analysis of the content and the distribution deals for films such as Go Fish, Precious, and Fruitvale Station. At the 2014 Sundance Film Festival, I met with filmmakers, screened films, and sat in on a number of panels with independent artists. This experience allowed me to add to my conclusion and further test my argument that the festival has become an institution for "independent" filmmakers who are actually already in the industry.

**Snyder, Kaitlyn; Burke, Lindsey; Chambers, Nicole; Mienaltowksi, Andrew; Lemerise, Elizabeth;** "Longer Is Not Necessarily Better: Younger And Older Adults' Performance On Short And Long Versions Of An Emotion Matching Task" (Andrew Mienaltowski)
Advancing age is generally associated with decline in emotion recognition ability. We examined the impact of length of an emotion recognition task on younger and older adults' performance. Participants either completed a 320-trial task or a 640-trial task that involved matching the emotion of a target face to that of one of two standards expressing emotion at a lesser intensity. Trials involved angry, fearful, happy, sad, and disgusted expressions of various intensities. Consistent with past findings, accuracy improved with increasing emotional intensity. However, younger and older adults did not differ in overall emotion matching performance. Also, task length did not influence matching performance or interact with any other factor. Future research will examine how further reducing the number of trials influences response reliability.

**Somers, Lucas** "Censorship In The American Revolution" (Beth Plummer)
The American Revolution took place during the Age of Enlightenment, which sought to overthrow the traditional society in much of Europe, and it promoted ideas such as religious tolerance, freedom of speech, and freedom of the press. Although these principles were gaining support in Europe and in the American colonies by the end of the eighteenth century, once independence from Great Britain was declared in 1776, public opinion on both sides of the Atlantic played a vital role the future of the colonies. Censorship was used by both sides during the war to control public opinion to best fit their

own war effort, and this paper shows how the regulation of certain ideas was able to exist while such freedoms were becoming more important in western society.

**Soto-Freita, Angelica; Shake, Matthew;** "The Effects Of Cognitive Ability And Text Genre On Age Differences In Mindless Reading" (Matthew Shake)
Previous research found that older adults (OA) mind-wander less than younger adults (YA) during reading; however, the reasons for this are unclear. We investigated whether cognitive ability and text genre predict these age differences. 34 younger and 34 older adults read narrative and expository texts. Participants were probed every 2-4 minutes to determine whether they were off task. Participants also completed tests of cognitive abilities. A Genre x Age interaction showed that YA differentially mind-wandered more for the expository text, $F(1,66)=3.93, p=.052$. Vocabulary scores were negatively correlated with mind-wandering on both texts.

**Southwood, Collin** "The New Western Kentucky University Science And Research Institute: An Expression Of Science" (Laura Leach)
Research that was conducted has developed the idea of the new Science and Research Institute, a building that expresses the sciences that are studied within it. Natural daylighting is the main focus during design, along with expression of science, and student and faculty collaboration. Natural daylight issues were combated by including a vast amount of windows on the southern side of the building complete with awnings that double as solar panels, providing a passive solar aspect. A four story courtyard is implemented through the center of the institute that is designed to allow as much sun into the building during the winter months. Various balconies and green roof spaces are included for students and faculty to collaborate and enjoy.

**Spiegl, Jonathan** "WRECC Demand Voltage Reduction" (Mark Cambron)
Warren Rural Electric Cooperative Company (WRECC) is a local power utility which is constantly attempting to minimize the cost of supplying power to customers. WRECC purchases power in kilowatts (kW) from Tennessee Valley Authority (TVA). The goal of this project is to analyze 2012 summer and winter voltage level peaks and determine the amount of de-regulation via the voltage regulators that can be implemented across the entire system to decrease the peak kW. This kW reduction will save WRECC money. After analysis has been done, a cost-benefit assessment will determine the amount of money that can be saved by de-regulating the voltage. Another aspect that will be considered is establishing communications to the voltage regulators if it proves cost-effective for the regulators to have supervisory control.

**Spraggs, Mary** "A Multi-wavelength Analysis Of Cold Evolving Interstellar Clouds" (Steven Gibson)
The ambient interstellar medium (ISM) is too tenuous for clouds to collapse on their own, but the formation of molecular hydrogen ($H_2$) aids this process by shielding the cloud interior from UV radiation, allowing the cloud to cool and contract. We are interested in finding areas in the Milky Way where $H_2$ is forming and studying their physical properties and environment to determine what conditions are responsible for triggering $H_2$ formation. We measure the neutral atomic hydrogen (HI) content and properties with HI self-absorption (HISA) and the $H_2$ content with carbon monoxide (CO) emission plus Planck dust column density to detect "dark" $H_2$. HISA is a known tracer of the coldest HI, where $H_2$ formation is most likely to occur, so we target HISA clouds in our study.

**Staples, Amanda; Maples, Jill;** "Metabolic Gene Expression Increases In Skeletal Muscle After Epigenetic Modifications" (Jill Maples)
Introduction: Epigenetic modifications provide a potential bridge for the interactions between genetic and environmental factors, like a high-fat diet. Purpose: To determine the epigenetic adaptions that

affect gene expression in skeletal muscle when in lipid oversupply. Methods: DNA/RNA was isolated from human skeletal muscle cell cultures following a 48hr incubation in 1) lipid solution or 2) 5% BSA (control) media. mRNA content was measured using real-time PCR. Methylation was measured by restriction enzyme digestion, followed by real-time PCR. Results: Data indicate methylation of promoter regions of metabolic genes decreased in response to lipid oversupply while gene expression increased. Discussion: Metabolic gene expression may be dependent on the epigenetic modifications induced by a high-fat diet.

**Starling, Michael; Starling, Michael; Cribbs, Jennifer;** "Bonding With Literacy: A 5e-chemical Bonding Lesson" (Jennifer Cribbs)
A comprehensive understanding of chemical bonding is essential for understanding advanced chemical concepts including chemical kinetics, chemical equilibrium, thermodynamics, and gas laws. Without an understanding in chemical bonding, students lack the fundamentals to succeed in understanding these more complex topics. To develop this comprehensive understanding, students must be able to describe the process by "speaking the language" of chemistry with sufficient scaffolding by the instructor. Graphic organizers, vocabulary journals, and pre-teaching of vocabulary have been shown to be effective strategies in building students chemical literacy. In this lesson, I will present snapshots of a unit plan using different literacy strategies for high school students studying chemical bonding.

**Steber, Kayla** "Student Attitude And Gender In Relation To Student Participation In Physical Activity" (Pamela Jukes)
The purpose of this research project was to determine how student gender and attitude toward physical activity correspond to student participation in physical activity in and outside the after-school program setting. Surveys were administered to parents and the lead counselor of five different after-school programs located in the south-central part of the United States. Data were collected on the students' attitude and physical activity. The lead counselor at each site provided information regarding number of students in the program and the percent of students who were physically active at the after-school program. The parent survey gathered information on the students' attitude and physical activity outside of the after-school program, as well as parents' attitude toward physical activity. It was concluded that gender does affect student activity level and the types of activities in which students participate. Males spend more time participating in physical activity.

**Steele, Kayla** "Cross-cultural Communication In Nursing: A Short-term Missions Perspective" (Jeanette Gullett)
This thesis examines barriers to cross-cultural communication in nursing, including a tendency to evaluate and the assumption of similarities. Two approaches to providing culturally congruent health care are discussed: the culture-centered and culture-sensitive theories. I review the current trend of international volunteer travel with a focus on short-term (1-2 week) medical trips and how cross-cultural communication issues can influence the effectiveness of volunteer nurses. Advantages include making health care available to impoverished populations. Disadvantages include a lack of follow-up care and community dependence on outside aid. To increase the effectiveness of these trips, it is recommended that volunteers coordinate with full-time health care workers in target communities and utilize pre-departure training.

**Steen, Allison; Mutter, Sharon; Parks, Jessica; Lowry, Danielle;** "Effects Of Reward Cues On Item And Associative Recognition" (Sharon Mutter)
Relatively little is known about how motivational variables affect memory. To explore this issue, we presented high or low value reward cues prior to each word pair in a study list and examined how this manipulation affected subsequent item recognition (i.e., cued recognition and context recognition) and

associative recognition (i.e., pair recognition and associative recognition). Preserved semantic context led to better item recognition performance, but reward value had no effect on either cued or context recognition. Associative recognition was poorer than pair recognition and reward value had a large effect on both of these tests. These findings suggest that reward motivation plays a more important role in the cognitive control processes responsible for item – item binding than in those responsible for context - item binding.

**Stephens, Caitlin** "Improving Access To Care: Mobile Dental Units" (Lynn Austin)
"Improving Access to Care: Mobile Dental Units" By: Caitlin Stephens Abstract Despite efforts to improve oral health, untreated childhood tooth decay continues to be a major concern in the state of Kentucky. It is said that an estimated 42.8 percent of children in Kentucky suffer from early childhood caries (ECC) before the age of five and 39.3 percent of these children have never been in a dental office (The Kentucky Oral Health Summit). So, what are the major issues influencing these statistics? Factors typically cited include living in rural areas and/or not having insurance, both which may result in a lack of access to dental care. In order to collect the data, the researcher will use the records of the Western Kentucky University Mobile Dental Unit to assess fifty patient's location, whether or not they have insurance, and if there is a presence of dental decay.

**Stewart, Joshua; King, Rodney; , Claire Rinehart;** "Isolation And Characterization Of A Bacteriophage Sparxx, A New A4 Subcluster Mycobacteriophage. Josh Stewart, Rodney A. King And Claire Rinehart" (Rodney King)
It is estimated that 10^31 bacteriophage particles exist on the planet. The goal of this project was to gain insight into the diversity of this extremely large population by isolating and characterizing new bacteriophages from the environment. Using Mycobacterium smegmatis as a host, a single bacteriophage type was isolated and purified from a soil sample collected from Crestwood, Kentucky. Electron microscopy of Sparxx phage particles revealed 54.89 nm icosahedral heads and 130.85 nm noncontractile tails. Restriction analysis of purified genomic DNA suggested that Sparxx belongs to the A4 subcluster of mycobacteriophages and recent DNA sequence analysis has verified this result. Sparxx is the newest member of the mycobacteriophage subcluster A4 which consists of 45 known phages.

**Stinnett, Kimberly; Day, Martha;** "Modeling Le Chatelier's Principle Using A 5e Inquiry-based Lesson" (Andrew Wulff)
The project involves the development of a 5E lesson on Le Chatelier's Principle for high school. 5E lessons focus on student-directed learning, which help facilitate the development of cognitive models and allow students to better understand abstract concepts, in this case Le Chatelier's Principle. Students are allowed to discover the concept on their own through guided inquiry which increases retention of the concept idea found in the lesson. A 5E lesson has 5 parts: engagement, exploration, explanation, elaboration, and evaluation. The lesson begins by asking the student if they want to learn how to make silver. The students then create a precipitate of silver chloride. Phase diagrams are introduced to explain Le Chatelier's Principle. Feldspars are used to discuss changes in concentrations as a real world example in the elaboration.

**Stinson, Landon** "Expanding One's Digital Thumbprint" (Matthew Tullis)
Expanding Ones Digital Thumbprint through Design Landon Stinson The digital thumbprint of a young professional is something that has to be worked on nonstop throughout their career. The more a digital thumbprint is circulated the better. By placing a well designed graphic on a social media site a designer's thumbprint can circulate quickly thereby building his or her reputation. The process of making a graphic by using materials such as stencils and painted images is a technique that can create unique digital designs. This process can make an otherwise rather simple graphic look unique and

layered. I plan to present the following materials at the 44th WKU SRC: the raw materials I use in my creative process, the finished poster graphic, and a flow chart tracking the online responses to above mentioned poster.

**Stone, Kaley** "American Red Cross Disaster Preparedness" (Leyla Zhuhadar)
In the 2012 calendar year the American Red Cross responded to 61,058 disasters in the United States. The objective of this research is to discover how prepared Western Kentucky University students and employees are if a major disaster where to happen in Bowling Green, KY. The goal of this project is to also find out what percentages of people have previously volunteered compared to how many would volunteer in the future. Being completely prepared for a disaster requires different aspects, for example, having a disaster kit on hand is one of the biggest steps to being prepared. As apart of this research process the data collected to support our finding were a mixture of data from the American Red Cross Society, employees in the local Bowling Green office, online surveys, and face-to-face interviews.

**Stone, Whitley; Schafer, Mark; Lyons, Scott; Arnett, Scott; Hoover, Don; Evans, Gina;** "24-hour Post-exercise Hypotension Following Concurrent Cardiovascular And Resistance Exercise" (Mark Schafer)
Despite investigations on aerobic (CV) and resistance trainings' (WT) role in eliciting an acute blood pressure (BP) response, termed post-exercise hypotension (PEH), few have investigated how BP will be affected when combining CV and WT into a single session (concurrent training) and when the order of exercise is altered. Participants (n=13) performed a maximal graded exercise test (GXT) and two concurrent sessions wherein the order of exercise mode was counterbalanced (CVWT & WTCV). Recovery BP was analyzed in the laboratory for 60 minutes and for 24 hours thereafter using an ambulatory BP monitor. All exercise conditions elicited a PEH response. Differences were noted at minutes 10 (p=0.009), 20 (p=.0.041), 25 (p=0.011), 30 (p=0.041), 35, (p=0.026), 45 (p=0.002), 50 (p=0.02), and 55 (p= 0.008). No significant differences were noted for 24 hours after exercise conditions. It may be determined that the order of exercise does not affect the preventative attributes of CV and WT.

**Stuckwisch, Curtis; Bucklew, Timothy; Addington, Jonathan; Rizzo, Ron; Dettman, Mattew;** "Determination Of Forces Induced On A Horse Rein" (Mattew Dettman)
This project will test the amount of force that a jockey will pull on a horse rein while in use. This will be done by placing stress sensors onto the horse rein and measuring the change in voltage induced onto the sensors. The change in voltage indicates a change in force induced on the rein. The sensors will be calibrated by applying known weights to the rein and plotting voltage versus load. Form this data an equation will be derived that will allow rapid determination of loads applied while the rein is in use. Doing this will allow us to know the exact forces that horse reins see every day to come up with new standards for horse reins.

**Sweeting, Larry** "Philosophy Of Sustainability" (Laura Leach)
Sustainability is about survival. (Cascio, 2001-2014) The philosophy of building design which reflects the ability of providing help and services to Bowling Green community's children. Research was applied to design a new sustainable Boys & Girls Club for the city of Bowling Green. The current Boys & Girls Club is overcrowded, not to current building code, and serves only one section of the growing community. The building design is to apply and improve current conditions: its location, interior usage of space, building size, and architectural sustainability. Philosophy of survival of any community is to come together as one, become strong and be able to survive. Applying this philosophy to the Boys &Girls Club and the building's design will provide a space where children get the help they need to become responsible members of society.

**Tagliaboschi, Aaron** "Development Of A Method To Convert Fortran Potential Energy Surface Subroutines To The Potlib2001 Standard" (Jeremy Maddox)
Elementary chemical reactions may be described theoretically using Born-Oppenheimer potential energy surfaces. The calculation of molecular potential energies often involves the parameterization of a given model using experimental data and/or first principles quantum chemistry theory. The results of such work are often encoded in a numerical program, written in the FORTRAN programming language, that may be used for various applications in the study of chemical reaction dynamics. An effort has been made to standardize these codes using the so-called POTLIB2001 standard. In this talk I will outline the process by which potential energy surface subprograms are converted to the POTLIB2001 standard, the use of such codes, and how this standardization is beneficial for applications in research and education.

**Thorley, Jacob** "Blockbusted: The Future Of Cinema Exposed By The Blockbusters Of The Past And Present" (Jerod Hollyfield)
Regarding the advancement of cinema as art, blockbusters are often portrayed in a negative light. However, they are the films that make the most money & major picture studios plan their year-release calendar around the summer blockbuster season & have done so ever since Jaws in 1975. But with the surge of film franchises & large-scale adaptations in recent years, the studios may be in trouble. Blockbuster films are huge investments of calculated faith. Of the top ten biggest box-office bombs five were released in the last three years. I intend to look at the development of the blockbuster & expose how much power they have within the entire film industry. Additionally, I will propose a solution to the inflation of these large spectacles that are multiplying each year & losing hundreds of millions of dollars.

**Thornton, Emily; Mahmood, Rezaul; Durkee, Joshua;** "26 April 2011 Pre-frontal Squall Line And Subsequent Kentucky Mesonet Data" (Rezaul Mahmood)
In this research we examined the characteristics of a pre-frontal squall line that propagated into western Kentucky and produced a max three second wind gust during a five minute data collection period of 100.7 mph (45 m/s) for a station located in Calloway County in Kentucky. Although associated with a squall line, the gust was notable when compared to four Kentucky Mesonet stations that are adjacent to the station from the north, east and west whose wind gusts averaged 20 mph (8.9 m/s) during the same five minute period. The squall line also produced further damaging winds from 60-65 mph (26-29 m/s) that were recorded as it progressed through western and central Kentucky. This research focuses on diagnosing the atmospheric contributions that led to the development of the pre-frontal squall line and subsequent anomalous wind gust.

**Tinker, Darren; Choate, Robert; Lenoir, Joel;** "Project-based Learning: The Evolution Of A Senior Project To A Laboratory Test Bed" (Robert Choate)
The proper selection and integration of centrifugal pumps require that engineering students understand their performance characteristics and operational parameters in various configurations. To support student learning, a centrifugal pump test bed was designed, built and tested for the Thermal Fluids Laboratory at Western Kentucky University. Initially fabricated as a senior capstone project, the test bed has since been enhanced by student workers. Modifications of the test bed include multiple design iterations of the pipe network, revision of measurement techniques, and incorporation of an electronic enclosure with an external control system. The purpose of this paper is to present justification and an analysis of the evolution of the project and also elaborate on the significance of the test bed's functions in a laboratory setting.

**Tinker, Darren; Lenoir, Joel;** "Design, Installation, And Implementation Of A Pan/tilt Camera Mount On A Quadrotor" (Joel Lenoir)
Quadrotors are small, agile vehicles with maneuverability permitting both indoor and outdoor flight. The

majority of devices are flown autonomously or from a third-person perspective. Our lab at Western Kentucky University has built a quadrotor and is exploring various modifications to refine its performance and expand its applications. Recent research revolves around the addition of a camera to explore the areas of first person view (FPV) piloting as well as photogrammetry. A gimbal with pan/tilt capabilities was designed and built via a Stratasys rapid prototyping machine. The mount was designed based on a vibrations analysis of Solidworks, a statistical analysis of the thermoplastic used by the Stratasys machine, and payload testing. The camera mount allows a pilot to control our lab's drone using FPV for flight or research purposes.

**Tope, Cynthia** "Reaction Rates Of The Amino Acids Cysteine, Methionine, And Histidine With Analogs Of The Anti-cancer Drug Cisplatin" (Kevin Williams)
We are studying the reaction of analogs of the anticancer drug cisplatin with amino acids that differ in size and shape. The reaction of cisplatin with proteins likely precedes reaction with DNA in the body and the size and shape of the platinum complexes often affects the rate of reaction with proteins. In this study, analogs of cisplatin differing in bulk were reacted with the amino acids cysteine, methionine, and histidine simutaneously. Using NMR spectroscopy, we were able to monitor these reactions. Preliminary testing suggests that the bulkier ligand reacts faster with the cysteine than the other amino acids when reacted simultaneously. Previous testing shows that bulk slows down reaction. When in the competition reaction, it is shown that the bulkier complex reacts more with cysteine than with methionine or histidine.

**Treece, Mallory; Rich, Timothy;** "Opinions On Gun Control: Evidence From An Experimental Web Survey" (Timothy Rich)
Political parties in America are becoming more polarized as evident in arguments about gun law reform. In order to learn how a person's political affiliation influences their support for gun control, I have produced a web survey asking general opinions on gun control. I have also purchased a nationally representative sample for the web survey. I use an embedded experiment about hypothetical legislation on gun legislation. In some versions of the web survey, a party identifier will be included. In one version Democrats propose the legislation, and in the other version Congress proposes the legislation. Other questions will have no tag affiliating the legislation with a particular party. A difference in the responses to the question is expected when the question contains one tag or the other.

**Trimbur, Rebecca** "Practical Application And Presentation Of 1950s Garment Research" (Shura Pollatsek)
The project that we chose for this spring semester is a collaborative venture with a practical application in the spring musical of Curtains for the WKU Theatre and Dance Department. Adrienne Nixon designed costumes for a portion of the musical, requiring research into both the 1950s and the 1950s view and understanding of Wild West culture. Rebecca Trimbur patterned and constructed a garment designed by Adrienne Nixon, requiring research and deep understanding of the construction of 1950s-inspired Wild West clothing. In our presentation, we will outline our extensive hands-on research in New York City of the 1890s clothing that provided the inspiration for the Wild West era in this project. We will also be covering the steps of designing, patterning, and collaborating between designer and draper in order to make a costume for the stage. The presentation will go through the specific steps of creating a costume from the conception of the idea to the creative execution.

**Turner, Leah Catherine; Anderson, Denise;** "Assessment Of Horses For Therapeutic Riding Purposes: Comparison Of Physiological And Behavioral Parameters" (Petra Collyer)
Many accidents in the horse sector happen due to a misinterpretation of the horse. With uncertain history and lack of information, unsuitable behavior or vices in the animal are often not obvious during the

compatibility sessions conducted by the facility. This study will assess horses' emotionality by assessing and evaluating behavioral and physiological parameters through three different behavioral tests along with observation of the animal during therapeutic riding sessions. Behavioral signs of mental state, fear, and pain will be monitored through video footage and evaluated with an ethogram. Salivary cortisol levels and heart rate monitoring, which are established methods of stress level assessment in horses, will be evaluated and compared to the behavioral test results. We hope to reduce behavioral wastage in horses, and increase safety for the handlers and riders.

**Tyrie, Elizabeth; North, Leslie;** "Using Eye-tracking Techniques To Assess The Effectiveness Of Karst Visualizations: Seeing Through The Complexities Of Karst Environments" (Leslie North)
Karst environments are interconnected landscapes vulnerable to degradation. Many instances of anthropogenic karst disturbance occur because of the public's lack of understanding of karst and the development of overly complex karst materials. Eye-tracking can be used to assess educational effectiveness in visual learning materials. This study aimed to assess and improve the educational effectiveness of 2D karst visualizations by combining eye-tracking techniques with GIS, assessments, and semi-structured interviews. Specifically, visualization stimuli were studied through two eye-tracking trial phases, wherein data from phase one guided the creation of visuals used in phase two. The results revealed the most effective visualizations that communicated karst groundwater and contamination concepts. Furthermore, the results not only highlighted effective stimuli in karst visualizations, but also revealed important information about the use of stimuli in any visualization.

**Ursrey, Dustin** "5e-lesson For Teaching Impulse In 9th Grade Physics" (Jennifer Cribbs)
The 5E instructional model has shown to be effective at increasing student performance in high school classrooms. In this poster, I will review the 5E model and present a 5E lesson that teachers the concept of impulse to a ninth grade physics class. This lesson will focus on conveying the concept of impulse through an activity that has students measure the stopping time for a clay passenger colliding with three different surfaces: a hard wall, a foam pad, and an airbag. Two literacy strategies are use to help students. First, the necessary vocabulary is pre-taughtto the students. Second, the mathematics required to calculate impulse was taught with the aid of graphical organizers. Such use of graphic organizers and pre-teaching vocabulary have proven effective in helping students who suffer from illiteracy in science and mathematics.

**Vahid Alizadeh Dizaj, Mohammad** "New Mobile Payment Protocol: Mobile Pay Center Protocol 3 (mpcp3) By Using New Key Agreement Protocol: Vc3" (Brent Vanmeter)
Growing of wireless networks and popularity of mobile devices represents an incredible opportunity to empower them as a payment device. Unfortunately, some problems hindering the widespread acceptance of mobile payment. The proposed mobile payment protocol not only minimizes the computational operations and communications between the engaging parties, but also achieves a completely privacy protection for the payer, avoid repudiating transaction from each of them and decrease risk of replay attacks. In according to limitation of wireless networks and mobile devices, this paper recommends VMC31 key agreement protocol for generating shared session key between n parties. It is used instead of Diffie-Hellman key agreement protocol that works only for two parties and have heavier computation than VC3.

**Valentine, Haley; Yan, Bangbo;** "Synthesis Of Metal-organic Frameworks Involving Copper (ii) And 2,5-dichloroterephthalate" (Bangbo Yan)
Using primarily the solvothermal method, the goal of our research is to synthesize metal-organic frameworks (MOFs) consisting of copper (II) and carboxylate ligands with pores large enough to absorb mercury. A MOF is an inorganic-organic coordination polymer with metal ions linked by organic

ligands. Typically, these are three-dimensional materials with pores that can be used for hydrogen storage, catalysts, or the removal of CO2. In this presentation, we report a new MOF ([Cu(ClBDC)2](TEA)2; TEA = triethylamine, ClBDC=2,5-dichloroterephthalate) synthesized from copper (II) chloride, triethylamine and 2,5-dibromoterephthalic acid under solvothermal conditions. The framework of this new compound consists of two-dimensional layers separated by triethylamine molecules.

**Van Leer, Carmen** "For The Love Of Art" (Laura Leach)
The purpose of the Nashville Artist Residence Project (NARP) is to provide a place for artists to commune and produce projects for the Nashville community. Many artist communities provide temporary housing for artists to produce work; NARP will provide a more permanent living arrangement. To design this structure,research was conducted via self-analysis, Code analysis(emphasis on safety design), literature on functionality of space, and case studies on artists in residence. To continue the production, research will continue in interior design, interviews with artists, and observations of construction documents.The presentation will consist of the following: data collected through interviews and literary research,applied code analysis,and demonstrations of how the structure caters to the purpose of the project(renderings/floor plans).

**Van Meveren, Mayme; sinski, Jacek;** "Graphene-based 'hybrid' Nanomaterials With Manganese Oxides For Alternative Clean Energy: Synthesis And Properties" (Sanju Gupta)
We develop 3D 'hybrids' consisting of graphene-based systems and transition metal oxides (i.e. MnO2 and Mn3O4) laying the groundwork for high-performance electrochemical electrodes for alternative clean energy applications. To accomplish this, we designed hybrid nanomaterials by direct anchoring of MnO2 and Mn3O4 on the oxidized functional groups of graphene oxide (GO) and reduced GO (rGO) via mixing dispersions of constituents in mild ultrasonication. This approach affords strong chemical/ physical attachment and expected to have coupling between the pseudocapacitive metal oxides and nanocarbons with enhanced reactivity. We used a range of characterization tools such as SEM / EDS, Raman spectroscopy (RS), AFM and XRD to assess the structural quality of hybrids and to further studies for their electrochemical properties.

**Varney, Cody** "What Fairy Tail Creatures Really Are: Shrek And The Lgbtq Community" (Jerod Hollyfield)
Shrek, a DreamWorks film adapted from the children's book written by William Steig, tells the story of an ogre who travels around a magical land in hopes of clearing his swamp of fairy tale creatures, finding friendship and romance along the way. The moral of the film is that love is blind, and that even ogres can live "happily ever after". That is, however, only the surface reading of this film. In truth, this film—and the entire franchise, by extension—is about the oppression of homosexuals, using "ogres" as a metaphor. In this paper, I will examine the plots of all four main films in the Shrek franchise, drawing parallels between the treatment of ogres and other fairy tail creatures and the treatment of the LGBTQ community.

**Vickers, Abigail; Ward, Kaitlin; Lynch, Victoria; Gettelfinger, Amy;** "Eating Disorders In Bowling Green" (Alexander Olson)
"Eating Disorders in Bowling Green" addresses the causes and effects of eating disorders, their symptoms, and identifies groups of people that may be more susceptible to the disorders. Treatment accessibility and effectiveness in the Bowling Green area is reviewed and analyzed via the perspective of active community members in the area. These members identify the assets and deficiencies of eating disorder treatment within the community. Several global organizations are then discussed in order to obtain examples of effective practices in other communities that combat these disorders. These organizations serve as examples to improve programs within our own community. By learning from

others, Bowling Green can build upon its existing strengths and provide better opportunities for patients struggling with eating disorders.

**Vincent, Ryan** "Landscape Genetics Of The Endangered California Tiger Salamander In The Central Valley Of California" (Jarrett Johnson)
In this study we present a landscape-level population genetics study of the endangered California tiger salamander, *Ambystoma californiense*. DNA was isolated from the excised tail tips of 285 individual salamander larvae. Larvae were collected from 24 different ponds surrounding the Los Vaqueros Reservoir in Contra Costa County, CA. Each individual was genotyped at 12 microsatellite loci. The allelic combinations present at these loci comprised the multilocus genotype for our investigation, allowing for an evaluation of the genetic structure of *A. californiense* populations across the Los Vaqueros Watershed. The results from this investigation will assist in addressing the future conservation needs of *A. californiense*, as well as contributing to the protection of other threatened species.

**WAGHWANI, HITESH KUMAR; Pender, Dillon; Dakshinamurthy, Rajalingam;** "Direct Aminoglycoside Coated Gold Nanoparticles Synthesis, Characterization And Antibacterial Susceptibility Testing" (Rajalingam Dakshinamurthy)
Need for novel, innovative strategies for developing antibiotics is becoming a necessity due to an increasing number of evolving MDR bacteria threats. Kanamycin is an aminoglycoside antibiotic with bactericidal activity by interrupting protein synthesis in bacteria. In this study we report development of eco-friendly, single step synthesis of Kanamycin coated gold nanoparticles (Kan-GNPs) which has highly effective, antibacterial activity. The kan-GNPs were identified and and characterized by transmission electron microscopy (average diameter is is 15 ± 5 nm); UV/vis spectrophotometer; Electron dispersion spectroscopy (EDS) and FTIR analysis. We have tested the antibacterial activity of Kan-GNP's against multiple strains of bacteria, both Gram-positive and Gram-negative, and found Kan-GNP's to be highly efficient against all tested strains.

**Wahle, Sidney** "Benefit Of The Commons: How Synergy Supplements The Circular Economy" (Krist Schell)
A business' first obligation is to create economic growth. Though we have new technology, the game remains the same—cut costs. As populations rise, so does the strain on municipal resources. This research attempts to answer the question: "Is there a bigger benefit in continuing the same processes in the restaurant industry, or are there bigger benefits in changing processes to conserve resources become more self-sustainable?" To answer this field and secondary research of wastewater recycling products/methods and a food-waste recycling model will be conducted. This will involve a cost/benefit analysis and the creation of a model process that any business might adopt. The end result depicts a versatile system from which multiple players benefit by acting together towards a sustainable economy.

**Walker, Emily; Moad, Rachel; Emberton, Taylor; Hoover, Don; Arnett, Scott;** "Frontal Plane Knee Motion Of ACL-repaired And Non-injured Females When Using Knee Savers®" (Scott Arnett)
Women are four to six times more likely to sustain ACL injuries compared to male counterparts (Hewett, Ford, Hoogenboom, & Myer, 2010). Few investigations have explored if ergonomic devices may alleviate the stress placed on the ACL during deep squatting. The purpose of the study was to determine if Knee Savers® (KS) influenced the frontal plane knee motion when previously injured and healthy participants completed a squat. Female participants (ACL-repaired: n= 10; non-injured: n=10) completed a deep squat with and without KS. Results indicated a greater medial deviation in the frontal plane in the right leg of non-injured participants compared to the ACL-repaired group ($p \leq 0.44$). When squatting with KS, the non-injured group experienced more frontal plane motion at the knee, compared to the ACL-repaired group.

**Walker, Jeffrey; Rich, Dr. Timothy;** "Through The Hermit's Shell - The Regulation Of Ngos In North Korea" (Timothy Rich)
North Korea gained the moniker “Hermit Kingdom” as the country largely withdrew from interactions with the West during the Cold War. However, NGOs have quietly worked within the country since a famine in the mid-1990s pressured the North Korean government to request international aid. How did these NGOs begin operations in North Korea? How are the rules and regulations governing these NGOs decided? This research attempts to answer these questions through interviews with individuals who have worked or are currently working in North Korea, as well as through related academic and non-academic literature. The findings are as follows: the rules that apply to each organization contain general trends, but are determined on a one-by-one basis with several key factors heavily influencing what regulations apply.

**Walker, Matthew** "The Progression of Space" (Laura Leach)
In Gym Climbing: Maximize Your Indoor experience, Matt Burbach says "Climbing takes us out of our horizontal world and into vertical world that is physically demanding/ mentally challenging" (Burbach, 2004). The goal of the project was to create an experience that mimics the challenges of life and provide the opportunity to succeed through the design of Bowling Green Rock Climbing Facility. Research was conducted about sustainable design, gymnasium layouts and through surveys of employers at Climbing Nashville, The Craig, and Eldorado Climbing. Findings were applied to the design of Bowling Green Rock Climbing Facility. The design will create a healthy environment and provide challenges for individuals with different level of expertise that show the progression of experience through horizontal/vertical space.

**Wall, Skylar; Jent, Daniel; Ho, Phuong; Hughes, Eric;** "Suzanne Vitale Clinical Education Complex" (Robert Hatfield)
Suzanne Vitale Clinical Education Complex Primary Author/ Presenter: Skylar Wall Secondary Authors: Daniel Jent, Phuong Ho and Eric Hughes Western Kentucky University, United States Within the Suzanne Vitale Clinical Education Complex at WKU, there was confusion in leadership until Dr. Yvette Getch began her job as executive director on May 28, 2013. She soon realized that research had never been done about how aware Bowling Green was to what the CEC does as well as if the community knew how these programs could benefit a family. Dr. Getch then recruited the MBA program for assistance. My team and I surveyed 191 individuals within the community, which included WKU students/administrators, church members, gas station clients and Kroger customers. This gave us a very well diversified sample size. We found that of the Bowling Green population, that was surveyed, only 25% knows about the programs provided by the CEC.

**Walters, Rachael** "Mesoamerican Legend: A Creative Interpretation Of Quetzalcoatl And The Quetzal Bird" (Sonia Lenk)
The poster presentation will display the student-generated picture book portraying a creative illustrated story about the quetzal bird and Mesoamerican god Quetzalcoatl. The story ties together the mythology associated with the quetzal and Quetzalcoatl in a simple and cohesive manner, depicting the rich tradition and legend connected with these Latin American cultural figures. The book will serve as cultural material that can be used as a teaching tool in a high school level Spanish class. The story and illustrations are based off research of Aztec culture, history and art. In addition, the story is written in the target language of Spanish to enhance its use in classrooms. This publishable book enriches language and cultural learning.

**Wang, Chia-Mao** "Enhancing Project Management Processes for New Product Development" (Ahmed Khalafallah)
According to an investigation by Product Development & Management Association in 2012, the top 20% companies in the United States receive 38% of the revenue and 42% of the profit coming from the

sales of new products. In addition, the average failure rate of new products is around 41%. These alarming numbers indicate that it is critical to follow good practices for new product development. This study focuses on minimizing the failure rates for new product development using sound practices of project management. Specifically, the study investigates how new product development should consider the internal and external environments of a company, and how to control the resources and techniques to fit the company's goals. The study includes case studies from the exiting literature to reinforce the value of project management processes in controlling new product development.

**Ward, Autumn; Cribbs, Jennifer;** "Investigations Into Students' Identities With Mathematics" (Jennifer Cribbs)
This study uses data from a follow-up survey with a sample of 131 participants in order to better understand students experiences and perceptions about mathematics. Specifically, students' responses to two survey items related to their interest and perceived recognition are examined. Each unique response can provide further insight into how an individual identifies with mathematics. The data collected will be analyzed using a phenomenological approach in order to determine the frequency of emerging themes. These results could inform educators on the type of experiences that influence students' identification with mathematics.

**Ward, Charles** "Just Write The Damn Thing: A Writer's Journey" (David Bell)
My presentation covers the practical side of writing, from the first idea to the final words on the page. The greatest challenge to overcome when writing a screenplay is the physical task: how does one actually write it? I've looked at a variety of techniques to help organize my thoughts: Seinfeld's insight into his calendar method, Hemingway's mantra of never finishing a days work, and Judd Apatow's infamous vomit drafts. In conclusion, I realized that the writer's journey strangely mirrors the journey that all heros go through in stories. The call to action. The allies and enemies. The obstacles that grow more difficult as you build to a climax and are forced to change. Your old self dies and your new self is born. Eager for the next journey.

**Waterbury, Ronald; Kenderes, Stuart;** "Identification Of Samples From White Mountain, Sunlight Basin, Wyoming." (Andrew Wulff)
Three samples were collected from White Mountain, located in the Sunlight Basin, Wyoming. Each sample was photographed, and six billets were cut and made into polished thin sections for analysis using Polarized Light Microscopy (PLM). PLM analysis included identifying minerals, determining modal percentages, and characterizing textures, in order to assign rock names. Portions of the samples were powdered and smear mounts were analyzed using powder X-Ray Diffractometry. Different mineral species were identified along with bulk mineral percentages using an RIR method. Samples were identified as anorthosite (approx. 75% plagioclase + 20% pyroxene + olivine), brecciated clinopyroxenite in a felsic matrix, and autobrecciated clinopyroxenite. All samples have high-temperature mineral phases suggestive of a kimberlitic origin for the samples.

**Watts, Steven** "The Cultural Phenomenon Of The Vampire In Western Culture" (Michael Ann Williams)
For more than two millennia Western Civilization has had various concepts of the figure we now call the vampire. Most beliefs concerning the vampire have remained constant crossculturally throughout this entire time despite those beliefs being based on misunderstandings, misinterpretations or outright ignorance of naturally occurring phenomena and aspects of biology and medical science previously unknown or largely unexplored. Over time, despite advances in medicine and biology – particularly in the past two hundred fifty years – the misunderstandings and misrepresentations of prior signs and events have remained the culturally accepted norm. In my paper I will demonstrate how what was once believed to be of supernatural origins is in fact based upon medical concepts and show how these concepts originally led to the idea of the vampire.

**Webb, Jordan; Escobar, Nanci; Norris, Shelby; Gabbard, Hannah;** "Food Insecurity And Hunger in Bowling Green and Beyond" (Elizabeth Gish)
Food insecurity is an issue that plagues many communities around the world including Bowling Green. This presentation details an extensive fourteen week study consisting of interviews, readings and the comparison of communities on a national level. The research was then compiled into a multi sectional paper describing the state of food insecurity in Bowling Green and in other communities around the country. With this knowledge ideas were formed to help the community build upon the programs already established and create new programs that better serve the victims of food insecurity.

**Wells, Jesse** "The Evolution Of Death" (David Bell)
In the realm of literature, there is no other figure that has experienced as much change to its own self and form such as Death. This project intends to reveal the gradual growth and evolution of the character of Death in literature, spanning poetry, fiction, and even modern day theatre in the presentation and depiction of this shadowy figure. I will analyze and enlighten on Death's progression from a two-dimensional character to the human construct he has become today, using literature ranging from John Donne to modern films like Meet Joe Black. In this analysis, I will reveal how Death has obtained human characteristics, evolved from his 16th century depiction of gloom to the 21st century form of mystery, and developed a compassionate side. To summarize the significance of these findings, it reveals a side of Death that few know.

**Wellum, Justin** "Critical Analysis Of The Kenyan Health Care System And Models For Improvement" (Sam McFarland)
Global epidemics such as malaria, tuberculosis, and HIV/AIDS are plaguing developing countries in Africa. International aid has been given to these countries from public and private organizations in an effort to eradicate these health crises. My research focuses on Kenya as a model for assessing the current state of health care in these developing countries. I evaluate the effectiveness of Kenya's health care system at every level, including central, provincial, district, and rural, by visiting the country and performing specific research. I then propose a model that Kenya or any African developing country could adopt to improve their health care system. This model suggests the need for equally distributed funds, expansion of non-governmental organizations, ways to eliminate barriers to health services, and the development of an effective education curriculum. for the primary schools.

**Wesley, Milo** "Lgbt Representation And Presentation In Disney Animated Features" (Jerod Hollyfield)
Disney animated films attract an incredible amount of viewers of all ages. Because of the wide exposure of these films, we can map out the history of social issues being faced at the time of development of certain films. In my paper, I will be targeting the progression of LGBT representation in Disney animated films, not only in the exclusion/inclusion of LGBT characters, but in portrayal, intended audience responses, and homosexual stereotypes in villains, which is prevalent not only in Disney films, but has been a common trope in cinema throughout Hollywood's history. By taking note of the changes in how Disney has handled LGBT representation, we can not only predict how it will continue to develop, but predict how our society will develop alongside these future Disney heroes, heroines, and perhaps one day, gender-neutral protagonists.

**Westfall, Teresa** "Silence, Voice And Identity In Maxine Hong Kingston's The Woman Warrior" (Michael Ann Williams)
Historically, women have not been the masters of their destinies. In The Woman Warrior, Chinese-American Maxine Hong Kingston writes about the ideas of silence and the power of voice. This paper examines Kingston's many different types of voice and voicelessness, most notably her own. This paper explores how voice and voicelessness either strengthens or deteriorates a person's identity.

**Whelan, Celia; Williams, Kevin;** "Reaction Rates Of Amino Acids With Derivatives Of The Anticancer Drug Cisplatin" (Kevin Williams)
The reaction of the anticancer drug cisplatin with proteins most likely precedes the reaction with DNA in the body. When reaction with DNA occurs, cell death is observed, killing the cancer. But due to the affinity of cisplatin for sulfur-containing amino acids, such as methionine, reaction with proteins may occur prior to reaction with DNA. These protein reactions limit the effectiveness of the drug and may be the cause of the resulting toxicity. We believe that by adding bulk to the attached groups of our drug derivatives, reaction rates with sulfur-containing amino acids could be slowed down enough that reaction with non-sulfur-containing amino acids (such as histidine) would be favored. This would retain the success rate of the drugs in killing cancerous cells while possibly eliminating the side effects and toxicity caused.

**Whitaker, Kendra; Edwards, Jeffry;** "Preserving The Past Through Drawings" (Shahnaz Aly)
The research conducted is for the preservation of the Rose Daugherty house through drawing documentation. It included researching the standard for Historic American Building Survey (HABS) drawings, measuring interior and exterior distances accurately, and the history of the building itself. We experimented with multiple methods of measurement leading us to most accurate for the project. Our methods include using measuring tape, surveying equipment, and measuring through orthographically precise pictures that can be scaled in computer aided design software. The drawings presented helped to get the house on the historic registry through documentation the structure. The result of these documents are sketches, pictures, HABS drawings, and history on the house. These forms of documentation help to preserve the building for generations to come.

**White, Andrew** "Designing For The New Generation" (Laura Leach)
The sustainable research conducted was on how to combine the incomparable experience of an IMAX Theater with an integrated movie history museum and memorabilia retail. The renewable and forthcoming aspects applied will create a new generation of theaters that will incorporate design and sustainability. Exterior aesthetics of IMAX's were investigated as well as the design guidelines of an IMAX with the main emphasis being on the theater seating. "I mean, the whole idea of movies was it was special to go to see - you went to a movie theater to see something that was magical and amazing, in a very special location." (Bob Balaban) That feeling is the desired goal, resulting in the design that brings a new venue for all ages to gather in Bowling Green.

**White, Samuel** "Laser Intensity And Ionic Strength Dependence Of The Aqueous Nitrate And Carbonate Ion Raman Spectra" (Matthew Nee)
The photolysis of nitrate ion, NO3-, is important in snow chemistry, but its mechanism is poorly understood. During reaction, the solution environment is expected to change, which should affect the geometry and vibrations of nitrate. Such changes might then be observed with vibrational spectroscopy. Previous work in our lab found an effect in the Raman spectrum of nitrate that appeared to be related to its geometry as well as the power of the spectrometer laser. This could be used to study the photolysis mechanism, by monitoring the nitrate geometry in time. To determine the origin of this effect and relate it to the solution composition, Raman spectra of several different nitrate and carbonate solutions were collected over a range of laser powers. Similar data were collected on two separate spectrometers, to verify results.

**Whitehead, Aaron** "The Fatty Arbuckle Case And The Exploitation Of Celebrity Scandal In The 1920s Culture Wars" (Anthony Harkins)
In 1921, silent film star "Fatty" Arbuckle stood trial for murder in San Francisco. The outrage levelled against Arbuckle specifically and Hollywood culture in general fed into an existing cultural narrative of

Hollywood excess. The anti-Arbuckle outrage was the culmination of a campaign by the guardians of "traditional" American values to exploit the public sensation surrounding the case and to advance their arguments for censorship. The irony is that they were using modern forms of mass media, namely newspapers and magazines, to put forward a "traditional," or anti-modern, set of values. This paper seeks to explore the battle for control over popular film culture, fought by two sides that had more in common than is generally understood.

**Whitehead, Derrin; Applegate, Darlene;** "Archaeological Investigation of Historic Saltpeter Mining at Temple Hill Saltpeter Cave, Barren County, Kentucky" (Darlene Applegate)
Temple Hill Saltpeter Cave (a.k.a., Payne Cave, Skaggs Cave) is located on Skaggs Creek in Barren County, Kentucky. It is one of many caves in the region from which saltpeter was mined historically, though it is only the third small-scale mining site investigated by archaeologists. Artifacts and cultural features associated with historic saltpeter mining include working bays, tally marks, and tool marks. Saltpeter sediment was processed on-site in leaching vats of undetermined form. The saltpeter mining occurred throughout all passages of the cave, especially the trunk passage. The mining activity occurred primarily in the early nineteenth century in association with the War of 1812 under the direction of Brig. Gen. Alexander Spotswood, a Barren county pioneer.

**Wilck, Adam** "Safety And Sustainability: Franklin Fire Station Seven" (Laura Leach)
As the city of Franklin, TN continues to expand there also comes a need to expand its emergency response capability to meet the needs of a growing population. Through my research of sustainable building methods, commercial construction, building codes, historic architectural elements from Franklin, TN, as well as the requirements for operation of an emergency response facility, my intention is to design a new fire station for the city of Franklin that not only meets the modern emergency response needs of the area but also respects the environment and the historic look and feel that nearby Franklin, TN is well known for. The design of the new Franklin Fire Station Number Seven, located in the community of Westhaven in Franklin, Tennessee will both serve a rapidly growing community and have a light footprint on the surrounding environment.

**Williams, Chloe; Wichman, Aaron;** "The Buffering And Reversal Of Mortality Salience Effects Through Afterlife Beliefs" (Aaron Wichman)
When people are confronted with the thought of their own death, plausible evidence for an afterlife buffers the effects of mortality salience (MS) (Dechesne, Pyszczynski, & Arndt, 2003). Our goal was to study the role of naturally varying afterlife beliefs on the effects of MS on self enhancement. Participants were randomly assigned to either a TV control or MS manipulation, completed a self-enhancement measure, and reported afterlife beliefs. Results show that for those low in afterlife belief, individuals exposed to MS manipulation self-enhanced more than those in a control condition. This effect was reversed for those high in afterlife belief. Those exposed to MS self-enhanced less than those low in afterlife belief, or in a control condition. High afterlife belief may not only buffer MS effects, but can actually reverse them.

**Williams, Joshua** "Studying The Seyfert Galaxy Ii Zw 229.015: Determining The Mass Of The Central Supermassive Black Hole." (Michael Carini)
In this presentation, I will discuss my study of the brightest Active Galactic Nucleus in NASA's Kepler mission field, II ZW 229.015. This source was extensively monitored with Kepler and WKU's ground based telescopes and has the most complete, high time resolution light curve of any Seyfert 1 galaxy. I will discuss my observations and show how numerical analysis of these observations allows me to determine the mass of the supermassive black hole that resides at its center.

**Wilmes, Nicholas** "Transitional Accounting Methods In Accounting Standards Updates" (Allen Hunt)
Accounting Standards Updates (ASUs) have been issued by the Financial Accounting Standards Board (FASB) since the inception of the Accounting Standards Codification in 2009. Accounting Standards Updates update the Codification of financial accounting regulations to incorporate new pronouncements issued by the FASB and the Securities and Exchange Commission. We examine the Accounting Standards Updates from their inception up through currently unissued pronouncement documents. Our study classifies ASUs by topic, annual and interim transition accounting methods, and investigates how transition accounting methods vary by time or accounting topic.

**Wilson, Dallas** "Music Videos Since MTV" (Jerod Hollyfield)
This research looks at mainstream music video production since MTV was created and how it has impacted the music industry as well as the entertainment industry. This research draws upon mostly primary sources including newspapers, published books, and documentaries. The focus of this research is on the evolution of music video production and how it has grown from decade to decade. This case example shows how important the art of music videos are to an artist or a band and how they can make or break the success of an act. This research also examines the endless variety of creative ideas that come with the industry.

**Winchester, Jesse; Mahmood, Rezaul; Rodgers, William; Rappin, Eric; Durkee, Josh; Hossain, Faisal; Degu, Ahmed;** "The Impacts Of Land Cover Change On Local Precipitation Over The Land Between The Lakes Region." (Rezaul Mahmood)
This study investigates the potential impacts of the Land Between the Lakes (LBL) region of western Kentucky and Tennessee on precipitation. To determine these impacts, the human-made lakes were changed to land areas covered with grassland, broadleaf deciduous forest, and bare soils, and conditions were simulated for three precipitation events using the Weather Research and Forecasting (WRF) model to address the overarching goals of this project. Analysis consisted of the assessment of spatial and diurnal patterns of modeled variables over the LBL and surrounding areas to understand the processes and controlling mechanisms for precipitation under changed conditions in each simulation. The study finds that if the lakes were replaced with different land cover types, precipitation amount and location would be modified.

**Winstead, John** "Analysis Of Euphonic Blending Of " (Elizabeth Winkler)
A problem in contemporary standard American English exists such that the sentence "Who do you want to fire?" can be successfully restated with the blending of "want to" into "wanna". This feature appears to be totally euphonic. However, the sentence "Who do you want to fire John?" makes this blending impossible. The reason lies in the changed semantics of the sentence, which is independent of the euphonic of the sentence. I will establish that the euphonics of this sentences as well as many like it in English are also subjected to semantic interference and then explain their relationship, so that it can be explained how in that specific case we can understand why in one sentence blending is possible but not in the other.

**Woodward, Maggie** "Poems From Home Videos" (Jerod Hollyfield)
These poems are marked by contradictions: by confusion, clarity, and complete misunderstanding; they are an attempt by the author to navigate her own positionality and subjectivity in an undiscerning world. The collection is comprised of poems trying to make sense of history--histories of the author and of the places she inhabits. This is a poetry interested in playing with language--with repetition, connotation, and meaning--in an attempt to understand memory, family, and the future. The poems are rooted in womanhood, in the rural South, in loss, in life, and in a re-defintion of what it means to be home. This poetry presentation is part of my accepted FUSE Grant work; it will be presented again at the Pop Culture/American Culture National Conference in Chicago during the month of April.

**Woosley, Devon; Malone, Joseph; Wells, Stephanie; Nicks, Hannah;** "Rosine Substation Modernization Project" (Mark Cambron)
Warren Rural Electric (WRECC) is a local utility company that serves 65,000 members with 37 substations located throughout south-central Kentucky. The Rosine substation is perhaps one of their most outdated substations. WRECC has decided to modernize the substation for a variety of reasons which include aging equipment, limited manufacturer support, equipment failure, lack of safety features, and reliability issues. The goal of the project is to replace outdated technology with modern electronic relays. The design team will engineer the appropriate communications for SCADA (supervisory control and data acquisition) monitoring and control as well as engineering access. Researching and implementing these new electronic relays on WRECC's SCADA system will increase reliability, safety, as well as utilizing a cleaner, more efficient design.

**Wooten, Cody** "The New Schoolyard: Bullying In The Cyber World" (Anthony Harkins)
Cyber bullying;an extension of physical bullying that affects millions of young children today.Drawing from case studies and analysis of teens involved in the cyber world,I will show how being active in a social networked environment increases the risk of becoming the victim of bullying,but also how parental participation and media literacy guidance has proved to greatly reduce the risk of becoming a victim.With technology rapidly changing the lives of our youth,it is important to understand the effects of cyber bullying,and how parents and educators can effectively battle it through better understanding of the temperament of online bullies.This paper argues that it is equally vital to help young people understand how improving their media literacy will help them navigate an online culture that is not simply created for them,but by them.

**Wright, Spencer** "Allelic Variability In The Cyp11b2 C344t Single Nucleotide Polymorphisms From A Cohort Of East Africans" (Dr. Nancy Rice)
Essential hypertension (EH) is a risk factor for cardiovascular disease; while managing EH in developing countries is a high global priority few studies exist from third world populations. From a cohort of Kenyans, we have investigated the allele frequency of a single nucleotide polymorphism (SNP), CYP11B2 C344T, reported to correlate with EH. This SNP is located in the promoter region of the aldosterone synthase gene and affects the production of aldosterone. Our results reveal an allele frequency of T=0.80 and C=0.20, and a genotype frequency of T/T=0.71, C/C=0.09, and T/C=0.20 (n=41) for the Kasigau population. These observed genotype frequencies deviate from Hardy-Weinberg equilibrium.

**Xue, Yao; Gray, Elmer;** "The Threat Of Global Warming On Meeting Chilling Requirements Of Perennial Fruits Grown In Kentucky" (Elmer Gray)
Temperate Region perennial fruit and nut trees require requisites cold winter temperatures (chilling hours) to ensure regular production in the following season. Temperate Regions are characterized by variable winter and spring temperatures. Failure of meeting sufficient chilling requirements results in plant deformities. Chilling requirements are expressed as number of accumulated hours within a range of approximately 32 to 45 F. Kentucky needs an inventory of base line chilling hour's production. Necessary temperature data are available through Kentucky MESONET. The study is to utilize the data according to an established chilling hour model in the calculation of available chilling hours. Significant differences have been found among chilling hour production for sites, years, and distribution across months.

**Yadon, Jamey** "Political Elements In Early Anabaptist Baptismal Practice" (Lawrence Snyder)
During the Protestant Reformation, the most well known reformers left the classical church-state relationship largely unchanged. The early Anabaptists, who called for much faster changes than the

Reformation's leaders were attempting, argued for a separation of the church from the wider culture. The radical reformers were also the first to argue for the practice of believer's baptism—that the church should only baptize those who had made a personal commitment to Christianity. The life of Conrad Grebel (an Anabaptist leader), the Anabaptists' teachings regarding separation from society, and the conviction (shared by nearly all Christians) that baptism is one's entrance into the Christian world suggest a connection between these two ideas. This project's aim is to explore that connection in the work and communities of the early Anabaptists.

**Yani, Yeni Febriyani** "Efficient Utilization of Information Technology in Managing Coal Mining: A Case Study on Ithaca Resources Company in Indonesia" (Ahmed Khalaffalah)
Information technology (IT) and information systems (IS) are no longer considered a cost component for projects. They have transformed to be a benefit component for organizations. Their significance is also a result of how they are usually used to maximize tangible and intangible economic benefits for organizations. Best practices call for implementing efficient project management techniques, including the dependency on IT/IS. Ithaca Resources is a coal mining company with headquarter office based in Jakarta and other site offices in several other provinces in East Kalimantan, Indonesia. The company employed good project management practices that led to make this project effective and efficient. In this research a quantitative approach is employed to analyze the success of Ithaca in employing IT/IS solutions to maximize the economic benefits of the project.

**Yeater, Andrew** "Homer, Heroes, And Hogs" (Niko Endres)
In "This Little Piggy," an episode of the children's cartoon "Justice League Unlimited," familiar heroes Batman and Wonder Woman combat the sorcery of an unusual and unexpected foe: the goddess Circe. Literature buffs know her for turning Odysseus's men into pigs in Homer's "Odyssey." Perhaps it is no surprise that she continues this pattern in "Justice League," this time turning Wonder Woman into a pig. It may come as a surprise, however, just how many similarities this episode of a Saturday morning children's cartoon has to Homer's classic. This paper seeks to show the similarities between Wonder Woman and Penelope and Batman and Odysseus and also to show other points of comparison to "The Odyssey."

**Young, Katheryn** "The Pen Or The Sword: The Progression Of Thomas Jefferson's Political Ideologies From 1774 To 1776" (Michael Ann Williams)
While Thomas Jefferson can easily be considered an influential political thinker of the American Revolution, there continues to be debate over the origins of his ideologies. The goal of this paper is to discover the motivations behind the major shifts in philosophies from the time Jefferson wrote "A Summary View on the Right of British America" in 1774 to his more famous first draft of the "Declaration of Independence" written in 1776. In order to gain a clearer insight into the possible stimuli that occurred within this two year period, research was conducted examining the beliefs of popular Enlightenment thinkers, Jefferson's childhood and educational experiences, as well as the growing governmental tension between Britain and the colonies. The outcome of the research concludes that Jefferson can be considered an ideological product of his generation and the circumstance within which he rose to political prominence.

**Young, Whitney** "How Classroom Layout Impacts Special Education Delivery" (Wanda Chandler)
Classroom layout is an important component of classroom management. The purpose of this poster is to discuss how classroom layout impacts special education delivery and behavior of students. The components of the station-oriented design, the teacher-oriented design, and the student-oriented design will be discussed within the poster. A review of the research was conducted to determine the importance of classroom management in special education classrooms to promote positive student behavior.

**Younger, Keri; Mahmood, Rezaul;** "Equivalent Temperature Trends Across Kentucky" (Rezaul Mahmood)
Trends of surface air temperatures (T) and equivalent temperatures (TE), and their correlation to land cover attributes over Kentucky are investigated. Equivalent temperature values are calculated utilizing the high quality in situ observations from 25 stations in the Kentucky Mesonet, offering higher spatial and temporal resolution than that of previous case studies. Results indicate that the difference between TE and T values are greater during the growing season, with the magnitude of this difference varying from county to county, indicating a possible correlation to land cover types. The preliminary hourly data analyses show that there is a bimodal diurnal pattern of TE values. Results of this research will continue to improve understanding of how land use/land cover can affect site meso-climates and local heat content trends.

**Yousuf, Mohammed Adnan** "Ill Effects Of Carbonated Drinks On Teeth." (Gretchen Macy)
Ill effects of carbonated drinks on teeth. The purpose of this study is to reveal the evil effects of carbonated or soft drinks on the teeth. Since carbonated drinks have many potential health problems and it occurs over a period of time, the study was conducted mostly on the extracted human teeth. This step was taken after many clinical cases were reported correlating with consumption of carbonated drinks and tooth decay. The patients usually have long history of drinking soft drinks. They usually do not have any related medical, allergic or family history of dental problems. They also deny symptoms of gastroesophageal reflux disease, xerostomia, bruxism, etc. Carbonated drinks consumption is one of the major causes of tooth decay. Acids, carbonation and sugar in these drinks weakens tooth surface and enhances the growth of bacteria that contributes to tooth decay. Thus, these ingredients have both cariogenic and acidogenic potential that leads to dental caries.

**Yue, Jingyi** "Graphene From Electrochemically Exfoliated Graphite" (Yan Cao)
Graphene is a very promising material with unique properties, such as optical transparence, thermal conductivity, and mechanical strength. Many methods have being used for getting large-scale graphene sheets, such as chemical vapor deposition (CVD), chemical exfoliation methods based on the Hummer's method and other exfoliation methods including liquid-phase exfoliation and intercalation and expansion of graphite. However, those methods have several disadvantages and limitations such as high temperature and costs. Therefore, a novel approach of getting graphene sheets is presented here by using electrochemical exfoliation of graphite. It has been proven to be a relatively simple, inexpensive, less pollution method. Graphene sheets obtained by electrochemical exfoliation have better electrical properties than those from other oxidation methods. Produced graphene sheets dissolved in DMF can make films on different substrates combined with vacuum filtration and dry transfer methods.

**Zhang, Keyin** "Dental Health Status And Its Risk Factors Among Western Kentucky University International Students: A Cross-sectional Study" (Helen Zhu)
Purposes: To explore dental health status and its risk factors among international students. Methods: A cross-sectional study was conducted. Questionnaire was developed and validated. Data of dental health status and other risk factors were collected. Logistic regression was used to calculate crude and adjusted odds ratio (OR) and 95% confidence interval (CI). The study was approved by WKU IRB. Results: The prevalence of dental problems among WKU international students was 31.3%. Gender was significantly associated with dental problems with OR (95% CI): 3.28 (1.60-6.75). Health science students and those who did not seek dental services had significantly more dental health problems than non-health sciences and those who seek dental services, respectively. Conclusion: Females and students who had dental problems history and did not seek dental services should be encouraged to buy dental health insurance and actively seek dental health care.

**Zibart, Sarah; Wulff, Andrew; Arrowsmith, J;** "Comparison Of Morphometric Parameters In The Cima Volcanic Field, Ca" (Andrew Wulff)

The Cima Volcanic Field, located in the eastern Mojave Desert is home to many cinder cone volcanoes. Morphometric parameters of both the cones and lava flows were collected in past studies, in addition to several types of chemical dating analyses, giving approximate ages of eruption. More recent field measurements have been collected for selected cones. This study utilizes Digital Elevation Models (DEMs) to collect morphometric values, which were used to calculate relative cone ages. The old and new field values were compared to those gathered from the DEM, and the age estimates and spatial resolutions from the previous studies were compared to the DEM-derived values. This method of data collection could prove valuable for remote mapping applications, such as planetary geology as it does not require fieldwork to determine relative age.