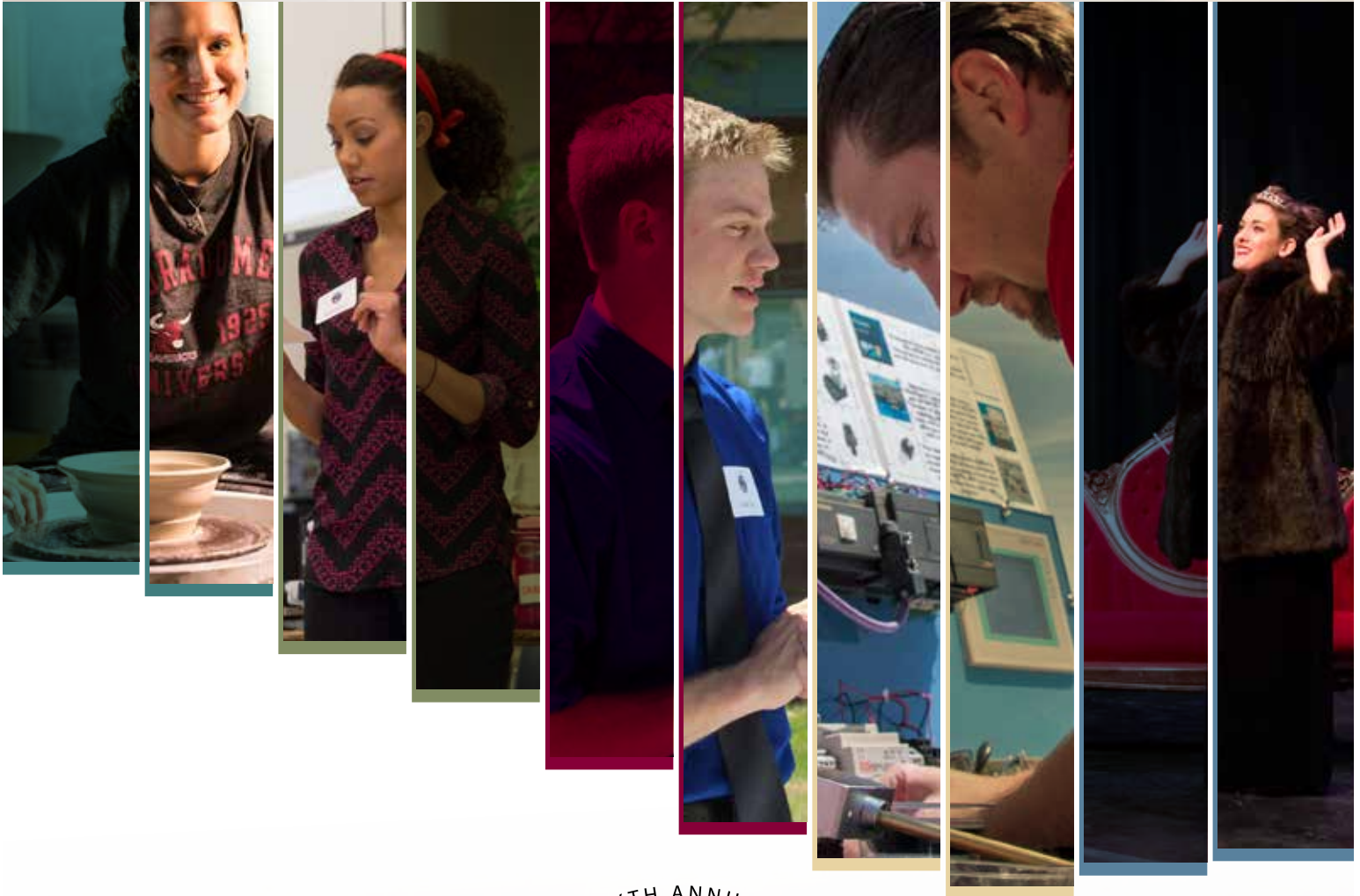




COLORADO MESA
UNIVERSITY



Friday, April 24, 2015

SHOWCASE PROCEEDINGS

coloradomesa.edu/showcase

About the Student Showcase

The Student Showcase highlights student works involving creativity, discovery, research, innovation and/or entrepreneurship through sessions by undergraduates at Colorado Mesa University and Western Colorado Community College. The Student Showcase builds on classroom experience and is a venue where students can share their work with faculty, student peers and community members. Students participating in this campus-wide forum have distinguished themselves as scholars. *Showcase Proceedings* contains the sessions' abstracts.

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Friday, April 24, 2015
Grand Junction, Colorado



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Physical & Environmental Sciences



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ABSTRACTS



Presenter(s)-Major: **Sandra Acevedo - Psychology-Counseling Psychology, Jessica Berry - Psychology-Counseling Psychology, Ethan Heimforth - Psychology-Counseling Psychology, Caitlin McGuire - Psychology-Counseling Psychology, Jacquelyn Minnillo - Psychology-Counseling Psychology**
Title: **REDUCING ACCESS TO MEANS OF SUICIDE BY DISSEMINATING INFORMATION TO GUN SALES FACILITIES**
Department: Social & Behavioral Sciences
Sponsor: Susan Becker

Abstract: According to the Suicide & Crisis Center, there are currently slightly more than 30,000 suicides annually (83 suicides per day; or one suicide every 17 minutes), with 12 of every 100,000 deaths occurring each year from suicide in America. Suicide rates in the U.S. can best be characterized as mostly stable over time with a slight tendency toward an increase. Suicide is the eighth leading cause of death in the U.S. Rates of suicide are highest in the western regions with the Rocky Mountain States ranking higher than the rest of the west (Suicide & Crisis Center). In 2012, there were 1,053 suicides among Colorado residents and the age-adjusted suicide rate was 19.7/100,000. This is the highest number and rate of suicide deaths ever recorded in Colorado, and represents a 16 percent increase over the number of deaths in 2011. In addition the suicide attempt rate is approximately 51.6 per 100,000. Suicide is the seventh leading cause of death in Colorado (Office of Suicide Prevention, 2013). Mesa County, found in western Colorado, has been identified as an area at high risk for suicide deaths. According to the Mesa County Health Department, Mesa County's suicide death rate is 21.78 per 100,000 deaths (Mesa County Health Department). Thus, suicide is a larger than normal problem for our county that needs to be addressed by increasing awareness and community support for prevention efforts. Trends show that males complete suicide at a rate four times that of females while females tend to attempt suicide at a higher rate than males (Suicide & Crisis). Males are also more likely to use firearms as the method of suicide (Lewiecki & Miller, 2013). The decision to suicide can often be somewhat impulsive and access to means such as handguns in the home are implicated in these suicide deaths at a rate 1.5 times higher (Watkins & Lizotte, 2011) than homes with no access to firearms. Long guns such as rifles and historical reproductions pose no significant risk to suicide behavior. To explore the benefit of providing information about suicide and suicide prevention to new gun owners, the state of Colorado has implemented a test project where any commercial venue (and firing ranges) where handguns are sold are provided prevention materials and posters to put up in their shops and to include in each purchase of a firearm. Five counties are participating in this project which includes follow-up assessment visits to determine the usefulness and willingness of shop owners to disseminate prevention materials and information. The counties are providing the follow-up data for analysis. The sample size of shops will be approximately 50, which will allow reasonable analysis and comparison data. Data will include both qualitative impressions of the materials and quantitative ratings of their willingness to assist in suicide prevention efforts.

Presenter(s)-Major: **Jenni Adams - Theatre Arts-Dance**
Title: **STILL A WOMAN**
Department: Theatre Arts
Sponsor: Megan Glynn

Abstract: Dancers will use the art of movement to depict the psychological, sexual, and physical after-effects of women who have lost their breast(s) to cancer. Breast cancer is a life-changing diagnosis that affects one in eight women today. The presenter's mother was one of those individuals. She endured countless rounds of chemotherapy and radiation that caused her to lose her hair, as well as have a lumpectomy that eventually lead to a mastectomy in her second fight. Being at home with her and discussing what she was feeling and going through not only as a mother, but as a woman were, at times, heart breaking. The physical effects of treatments and the loss of her breasts made her feel like she truly wasn't a woman anymore. Many women who suffer from breast cancer have similar feelings about the loss of their femininity with their hair and breasts. However, there are also many survivors who have been empowered by their battle, and feel more feminine than ever. Dancers will depict both the negative and positive psychological, sexual, and physical after-effects of women who have had breast cancer.

Presenter(s)-Major: **Angela Addington -Nursing-BSN, Jessica Dondero - Nursing-BSN, Kyler Ross - Nursing-BSN, Matthew Sawyer - Nursing-BSN**
Title: EXAMINING THE EFFECT OF PATIENT-CENTERED CARE ON LENGTH OF STAY IN THE INPATIENT SETTING
Department: Health Sciences
Sponsor: Bridget Marshall

Abstract: Background: Current research identifies patient-centered care and perception of quality of care with outcomes in terms of length of stay (LOS) as an area of interest. Several studies suggest a possible correlation among the concepts of patient-centered care, length of hospital stay, and patient satisfaction. A common theme was the glaring lack of research linking patient-centered care and length of stay. Purpose: This study aims to determine if an implemented patient-centered care model affects length of stay in patients following total hip arthroplasty. Method: This study would utilize a quasi-experimental pretest-post test design with a non-equivocal control. HCAHP scores and length of stay in Magnet status hospitals would be monitored in patients following total hip arthroplasty. Data collection instruments would include the Charlson Comorbidity Index, the Hospital Consumer Assessment of Health Plans Survey, and patient charts. The Pearson r correlation test would be utilized to determine data significance, and a two tail t-test would be used to control for possible extraneous variables.

Presenter(s)-Major: **Teddy Aegerter - Business Administration-Management, Ian Atha - Business Administration-Marketing, Danielle Kinkade - Business Administration-Marketing, Jazmin McFarland - Business Administration-Marketing, Malorie Weiss - Mass Communciation - Media Strategies**
Title: ATLASTA SOLAR CAMPAIGN
Department: Business
Sponsor: Tim Hatten

Abstract: Atlasta Solar Center is a locally owned company that has been serving the Grand Junction and surrounding area since 1979. Atlasta wants to educate their target market and shift the mental barriers that solar is expensive through new marketing tactics. This marketing campaign will not only raise sales and awareness of the company but will also raise awareness of the pros of solar. Primary and secondary research has been gathered in order to better understand the industry and the market to determine how to better implement these tactics. Atlasta Solar Center will benefit in sales, but will also benefit by raising awareness of solar energy and what it can do for Coloradans.

Presenter(s)-Major: **Barbara Allen - Geosciences-Geology**
Title: WELL LOG PROFILES AND COOLING HISTORY OF DEEP WELLS IN THE RULISON, COLORADO AREA
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

External Funding Source: Unconventional Energy Center grant 2014-1001

Abstract: Apatite fission track and apatite (U/Th)He analysis has provided new directions for age dating and reconstructing the cooling history of sedimentary rocks. We want to test the idea that the ancient Colorado River began to incise in the Rifle area ca. 10-6 Ma perhaps due to regional uplift, erosion, and cooling of basin-fill deposits in the Piceance Basin. To test this idea, samples will be acquired from a WPX well on the Flatiron Mesa south of Rifle Colorado. Previous studies of apatite fission track dating of Mesaverde sandstones from the MWX well near Rulison, Colorado indicate that samples needed for fission track dating at Flatiron Mesa are present at depths of ~5,000' to 10,000' ft. Apatite helium samples will also be acquired. A stratigraphic framework for the cooling history analysis will be constructed by using regional well logs and stratigraphic cross sections to determine accurate thicknesses and ages of sedimentary formations. The Grand Canyon is thought to have formed 6-5 Ma. We will determine if the Piceance Basin cooling and erosion history occurred before or after Grand Canyon formation as a means of evaluating whether or not this event influenced the erosional history of the upper Colorado River Basin.

Presenter(s)-Major: **Barbara Allen - Geosciences-Geology**
Title: NIOBRARA OUTCROP EVALUATION: NEXT BIG NATURAL GAS PLAY?
Department: Physical & Environmental Sciences
Sponsor: Rex Cole

External Funding Source: Unconventional Energy Center grant 2013-1004

Abstract: The hydrocarbon phase of the Mancos-Niobrara gas accumulation zone is in an offshore marine mud rock interval deposited in the Western Interior Seaway. Transportation of mud and very fine grained sand was driven by the sea-level changes

from plate tectonics and climatic cycles. An important interval in the Niobrara crops out along the Colorado River at the bridge for Colorado Highway 141 (32 Road). The 32 Road outcrop is a good example of the horizontal target HN1 zone being explored in the Piceance Creek basin. The bedding has a low apparent dip to the east and goes down stratigraphic section to the west. The HN1 zone is rich in layers of *Inoceramus* shells with exterior valves encrusted with oyster shells. The *Inoceramus*, oysters, and copepods thrived during an 83.5 to 88.5 Ma interval. Samples from the measured section will be prepared for mineralogy determination using an X-ray diffractometer, and the calcium-carbonate content of the samples using a calcimeter. Results will be correlated with nearby well logs, using an existing Petra database. The Mancos-Niobrara is the most attractive pathway, by far, in natural gas exploration and development.

Presenter(s)-Major: **Tamara Anderson - Nursing-AAS, Terri Clark - Nursing-AAS, Amber Gibson - Nursing-AAS, Bethany Hancock - Nursing-AAS**
Title: IMMUNIZATIONS: ARE YOU MISINFORMED?
Department: Health Sciences
Sponsor: Genell Stites

Abstract: This presentation urges the question, "Is society a victim of its own success in regards to the United States vaccination program?" Research is presented from medical records and government publications from the Centers for Disease Control and Prevention and local health departments that shows the increase in vaccine-preventable diseases is positively correlated with the decreased amount of people choosing to get immunized. The CDC develops scientific recommendations and protocols on the administration of vaccines. The protocols prevent death from diseases such as diphtheria, pertussis, polio, and measles, which in the past were fatal to many individuals. Vaccines were developed to activate the body's defense system to stimulate cells to recognize the virus as a threat if a person is exposed to the virus and then destroys the virus before it can fully infect him or her. This presentation shows the benefits of vaccination far outweigh the risk of the disease itself and demonstrates the need to coincide scientific reasoning with civic and moral responsibility. Additionally, information is provided regarding the science of vaccinations and myths and misinformation of the media are dispelled so listeners will be able to make an informed decision when deciding whether or not to get immunized.

Presenter(s)-Major: **Keren Lynne Angeles - Biological Sciences-Biology, Kathryn Hawley - Biological Sciences-Biology, Andrew Still - Biological Sciences-Biology**
Title: IDENTIFICATION OF APOPTOTIC RESISTANCE IN BREAST CANCER CELLS
Department: Biological Sciences
Sponsor: Kelly Jean Craig

Abstract: It is known that mitochondrial defects play a large role in human disease and health, including cancer development, which is why we chose this organelle to study in breast cancer. Dynamin-related protein 1 (Drp1), becomes localized at the outer mitochondrial membrane (OMM) and acts like molecular scissors to cut the mitochondria. This fission event mediates early stages of apoptosis. Since the cancer cell line (HTB-22) displayed more mitochondrial fission when compared to the control, (HTB-125 non-tumorigenic breast cells), we became interested in comparing the concentration and co-localization of Drp1 on the mitochondria and in the cytoplasm for both of these cell lines. We hypothesized the HTB-22 cells will display more co-localization of Drp1 on the mitochondria than when compared to HTB-125 control cells, as mitochondrial lengths were longer in the cancer cells. For a positive apoptotic control, we treated the cells with staurosporine to promote Drp1 translocation to the mitochondria. To determine the localization of Drp1, we used immunocytochemistry with confocal microscopy techniques to stain and view mitochondria and Drp1. Colocalization software was then used to determine the stained areas which represented mitochondria and Drp1 in the cells, as well as the percent of overlap of Drp1 on the mitochondria.

Presenter(s)-Major: **Jeremy Aparicio - Mechanical Engineering, Nickalaus Clemmer - Mechanical Engineering, Seth Coisman - Mechanical Engineering, Lukas Welton-Kubeczko - Mechanical Engineering**
Title: PELTIER DEVICE
Department: Mechanical Engineering Partnership Program, Colorado Mesa University and University of Colorado Boulder
Sponsor: Nathan McNeill

Abstract: The law of conservation of energy states that energy can neither be created nor destroyed but can only be changed from one form to another. Thermoelectric devices demonstrate the law by converting a difference in temperature to electrical energy, or using electrical energy to produce a difference in temperature. The transfer of heat from one side of the device to the other produces electrical current. On the contrary, as current passes from one semiconductor to another within the device, the electrical movement causes heat to transfer from one end to the other. This results in a hot side and a cold side of the device (a difference in temperature). This project will utilize an efficient type of thermoelectric device (called a Peltier device) to accurately demonstrate how this phenomenon works and how we may be able to harness electricity from waste thermal energy.

Presenter(s)-Major: **Gbenga Aramide - Mechanical Engineering, Brant Bear - Mechanical Engineering, Scott Culbertson - Mechanical Engineering, Mathew Wolfe - Mechanical Engineering**
Title: STEAM ENGINE
Department: Physical & Environmental Sciences
Sponsor: Jody Kliska

Abstract: When water is heated it expands as much as 1600 times; the steam created produces force which can be converted into energy. The steam engine is a machine that converts the heat energy of steam into a form of mechanical energy. During this project we will design and fabricate a working steam engine that can be used to convert heat into force. The steam engine will apply significant heat to water producing steam which then will be converted into force. The force can then be converted into energy. This team will produce a working steam engine to demonstrate how steam can be used, limiting our consumption of fossil fuels.

Presenter(s)-Major: **Jacob Ashurst - Manufacturing Technology-Machining, Nolan Britain - Process Systems Technology, Cody Carrico - Manufacturing Technology-Machining, Benjamin Pettis - Technology Integration-Network Technician**
Title: AUTOMATIC FOOD AND WATER DISPENSER FOR ANIMALS
Department: Western Colorado Community College
Sponsor: Bill McCracken

Abstract: Pet owners often find themselves making arrangements for feeding and watering their animals while they are away. Gravity-fed food and water dispensers address this issue, but with a few shortcomings. A simple, scalable, design should be available to ensure that animals from hamsters to horses can be cared for remotely by the owner. E-mail notifications will be sent by the dispenser to inform the owner when the supplies are depleted. These kinds of innovations are being explored, and incorporated into this project. The demonstration of this food and water dispenser will show that combining electronics, mechanics, and computers can modernize how pets are fed while the owner is away.

Presenter(s)-Major: **Deletha Assenmacher - Master of Business Administration**
Title: REDUCING HILLTOP HOME CARE PATIENT HOSPITAL READMISSIONS AND FALLS
Department: Business
Sponsor: Donald Carpenter

Abstract: The Centers for Medicare and Medicaid Services (CMS) have implemented quality measures and financial incentives for health care providers and hospitals to reduce excessive patient rehospitalizations. Performance against these CMS quality measures determines the level of financial reimbursements Hilltop Community Resources' Home Care (HHC) program receives. The client problem addressed is whether HHC can reduce the number of patient hospital readmissions and falls and optimize its nursing resource capacity in the HHC program so that reimbursement from CMS is optimized for services provided. Industry best practices related to reducing patient hospital readmission rates, the frequency of falls in the healthcare setting, and optimal staffing levels are the focus of the research. SPSS Statistical Software© was used to analyze the effect of possible changes that can be made to HHC's processes that may reduce rehospitalizations, falls, and in turn increase the program's profitability and increase patient health and wellbeing.

Presenter(s)-Major: **Garren Atchley - Mechanical Engineering, Jonathan Johannsen - Mechanical Engineering, Zachary Kennison - Mechanical Engineering, Nevin Lister - Mechanical Engineering**
Title: VISUAL REPRESENTATION OF SOUND WAVES
Department: Physical & Environmental Sciences
Sponsor: Sarah Lanci

Abstract: Sound is often perceived as a two dimensional wave when, in reality, sound waves actually travel in three dimensions. The purpose of this project was to design a model that would visually display sound waves in three dimensions. Starting with a Ruben's tube, a metal tube that demonstrates nodes and anti-nodes in acoustic standing waves using fire, this project expanded the use of flames to show acoustic waves in three dimensions. Gas molecules were displaced by sound waves when audio frequencies were played through a box, resulting in predictable patterns of the different frequencies.

Presenter(s)-Major: **Nathan Bachman - Exercise Science, Clint Imlay - Exercise Science, Matthew Sorensen - Exercise Science**
Title: EFFECT OF PACK WEIGHT ON ENERGY EXPENDITURE DURING UPHILL WALKING
Department: Kinesiology
Sponsor: Gerald Smith

Abstract: Military and recreational applications of load carriage have prompted studies that have demonstrated a positive relationship between load and VO₂, HR, and RPE. Purpose: The aim of this study was to determine the effect of pack weight on energy expenditure during uphill walking at a constant speed and grade. Methods: Three male subjects performed randomly chosen 5-minute walking trials while carrying five different loads: No Pack (NP), Empty Pack (EP), 10 (10% BW), 20 (20% BW), and 30% of bodyweight (30% BW). Walking trials were conducted at 1.34 m/s and 10% grade. Oxygen consumption (VO₂), heart rate (HR), and rating of perceived exertion (RPE) were recorded. Energy expenditure (in kilocalories) for each load condition was calculated using average VO₂ data from walking trials. Results: A positive linear relationship was observed between VO₂, HR, and energy expenditure and load. A significant ($p < 0.05$) linear relationship ($R > 0.963$) between relative oxygen consumption and total load (body weight + load condition) was observed for all subjects. Conclusion: Energy expenditure was 30% higher for the 30% BW condition compared to NP condition. The lowest metabolic cost occurred during unloaded walking (NP) and the greatest occurred under the 30% BW condition.

Presenter(s)-Major: **Chandler Baldwin - Biological Sciences-Biology**
Title: COMPARISON BETWEEN THE ZOOSPORE LYSING ACTIVITY OF PURE SUCROSE ESTERS AND PETUNIA LEAF EXTRACTS
Department: Biological Sciences
Sponsor: Margot Becktell

Abstract: Petunias, potatoes and tomatoes are the three most common hosts of *Phytophthora infestans*, the pathogen that causes a plant disease known as late blight. Late blight is best known for the devastation of potato crops during the Irish potato famine. It has been established that petunias are less susceptible to late blight than potatoes or tomatoes; however, the reasons for this reduced susceptibility are unknown. Work in our lab has shown that extracts obtained from both healthy and infected petunia leaves cause rapid lysis (rupture) of zoospores, the motile infective propagule produced by *P. infestans*. Preliminary results from biochemical analyses of the petunia leaf extracts have suggested that the lytic activity may be related to the presence of one or more sucrose esters (SE). To explore this possibility, pure SEs are currently being compared to petunia leaf extracts for their zoospore lysing activity. A positive result would support pursuing further biochemical analyses to identify potential SEs present in the petunia leaf extracts and will put us one step closer to determining why petunias are less susceptible to late blight than their potato and tomato cousins.

Presenter(s)-Major: **Melissa Bamford - Environmental Science and Technology, James Bright - Environmental Science and Technology, Gwendolyn Huffman - Environmental Science and Technology**
Title: WETLANDS RESTORATION AND ENHANCEMENT PLAN, REDLANDS CO., MESA COUNTY
Department: Physical & Environmental Sciences
Sponsor: Deborah Kennard

Abstract: Wetlands are highly regulated due to their ecological, hydrological and biological services. Due to section 404 of the Clean Water Act (CWA), Mesa County is required by federal law to mitigate degradation or loss of wetlands caused by development with the creation or restoration of existing wetlands. Our goal is to assess a wetland in the Redlands and develop restoration options. Impaired functions of these sites will be identified through sampling and assessment of the hydrologic, soil, and vegetative characteristics present. A special emphasis will be placed on identifying existing native plant and invasive species present at our two parcels of study. We will develop three restoration options for the two adjacent parcels. The plan, if implemented, will mitigate the wetland loss in Mesa County.

Presenter(s)-Major: **Kenneth Banning - Mechanical Engineering, Christopher Beamon - Mechanical Engineering, Andrew Bristol - Mechanical Engineering, Kaemon Jones - Athletic Training, Isaac Koch - Mechanical Engineering**
Title: ICE RINK
Department: Mechanical Engineering Partnership Program, Colorado Mesa University and University of Colorado Boulder
Sponsor: Nathan McNeill

Abstract: Skating on an ice rink is good recreational fun. While many people take advantage of this, many of them don't know the complex thermodynamic engineering that went into creating that simple sheet of ice. The goal of this project is to maintain a small piece of ice under standard indoor conditions. To accomplish this goal a system had to be designed so that all critical

temperatures, pressures, fluid flow rates, and power output /consumption can be easily measured and monitored. To do this a two fluid refrigeration system was created. Use of known heat transfer equations and a thermodynamic analysis allows the ability to design and purchase the correct parts to keep the ice frozen. The designers will demonstrate the functionality of the mini rink and explain the engineering that went into the project.

Presenter(s)-Major: **Brandon Barnhorst - Applied Mechanical Engineering, Matthew Cesario - Business Administration, Angelica Dressler - Business Administration-Entrepreneurship**
Title: DISC CONNECT: EXPANDING LOW COST RECREATION IN COLORADO
Department: Business
Sponsor: Georgann Jouflas

Abstract: This research focuses on providing and maintenance of permanent or mobile disc golf courses to the community with hopes of improving revenue streams for established businesses, increasing the number of disc golf courses both on the state and local level, improving individual health and fitness, decreasing crime, and helping to beautify the city with the addition of plants and trees. Potential target course locations include public and private land that is not currently in use or is not used all year long. Our target market focuses on college students, outdoor enthusiasts, current disc golfers, and the general public.

Presenter(s)-Major: **Kyle Bartels - Applied Mechanical Engineering, Alice Kerbein - Mechanical Engineering, Oscar Madrid - Mechanical Engineering**
Title: BUILDING ENERGY OPTIMIZATION
Department: Physical & Environmental Sciences
Sponsor: Scott Bevill

Abstract: Buildings are often rife with preventable energy loss – which can take the form of lights left on, heaters and coolers operating simultaneously, and spikes of concurrent energy consumption. The goal of this project was to identify these areas of loss at the Bishop Health Center on the Western Colorado Community College campus, and provide solutions that save both energy and money. This was accomplished by installing a power monitoring system in the building, making changes to the building's energy use, and tracking and reporting energy and cost savings. By reducing the building's overall energy use, this project demonstrates how power monitoring is a valuable tool that gives facilities managers the information they need to make cost-effective energy use decisions in real time. In past applications, this system has been shown to reduce the energy use of large facilities by up to 20%, making it an excellent investment for energy management.

Presenter(s)-Major: **Kyle Bartels - Applied Mechanical Engineering, Christopher Rowley - Applied Mechanical Engineering, Alex Zemezouak - Applied Mechanical Engineering**
Title: FLUID POWER SIMULATION FOR A PARTS CLEANING SYSTEM
Department: Physical & Environmental Sciences
Sponsor: Farzad Taghaddosi

Abstract: Fluid power systems play a major role in most industrial processes by converting the energy in a pressurized fluid (liquid or gas) into mechanical work. Depending on whether a liquid or gas is used, hydraulic or pneumatic systems can be designed to perform various high precision, heavy duty, and/or automated jobs. In this project, a pneumatic system has been designed and built that simulates the cleaning process of parts in a factory. The original system was initially drawn on paper and then simulated on the computer using the FluidSIM software to detect possible errors and hence ensure the smooth operation of the system, as intended. The designed system uses a variety of pneumatic components, such as actuators, directional control valves, flow control valves, time delay valves, push buttons, and roller switches, as well as several electrical switches and sensors. After the virtual design was completed, a physical model was built. To ensure the functionality of the design, a fluid analysis of the system was completed in order to find the optimal working pressure by accounting for energy losses, which included both major and minor losses due to friction in the tubing and in the actuators. Also calculated were the required forces to provide adequate movement of the parts.

Presenter(s)-Major: **Melissa Bashara - Business Administration, Katherine Corkett - Business Administration-Entrepreneurship, Jeremy Mattingley - Business Administration**
Title: INTEGRATED MARKETING COMMUNICATION FOR THE POINT
Department: Business
Sponsor: Emma Fleck

Abstract: The Point is a food and beverage bar located at Colorado Mesa University (CMU) University Center. The Point is the only on-campus location that serves beer and wine alongside coffee, soda, desserts, and a variety of hot food items. The Point

is managed by CMU business students and the management team has engaged in numerous marketing strategies and events in an effort to strengthen awareness and increase traffic since its inception in 2013. While they have had some success, general awareness and overall use of The Point remains low. However, based on extensive research, one of the most lucrative potential target markets for The Point was identified as students and faculty over the age of 21. The purpose of this Integrated Marketing Communications (IMC) plan is to increase awareness and promote The Point as a daily hangout, as well as an individual and group study space, for drinking-age CMU students, faculty, clubs, and organizations. The IMC identifies five promotional strategies that are specifically geared toward reaching this target market in the most cost-effective manner. The IMC establishes a budget of \$1,500 and a time period that begins in January 2015 and spans the Spring 2015 semester.

Presenter(s)-Major: **Ashley Bates - Business Administration, Kassey Cota - Business Administration, Lauren Elliott - Business Administration**
Title: FLAT TOP RESORT
Department: Business
Sponsor: Britt Mathwich

Abstract: This project is a development and conceptual marketing plan for a Hospitality Management class (HMG 450) at Colorado Mesa University. This project covers the six phases of resort development, the first three phases: resort concept, resort offerings, space design and a marketing plan will be presented. Ashley Bates, Lauren Elliott, and Kassey Cota are doing this project to outline major resort design decisions from floor plans to other specific visuals. With an unlimited budget the project location was able to buy out Mesa Lakes Lodge in Mesa, Colorado, on the largest flat top mountain in the world, and build Flat Top Resort in place of it. Open all year, round this unique resort is based on summer and winter outdoor recreational activities, Colorado craft beers, and bringing above average middle-class guests closer together.

Presenter(s)-Major: **Brittany Bell - Art-K-12 Teaching**
Title: SEVEN ELEMENTS OF ART: PRE VS. POST ASSESSMENT
Department: Teacher Education
Sponsor: Jennifer Daniels

Abstract: A group of 35 8th grade students were tested from pre and post assessment data. The test the students take is the same for both pre and post-test. They are being tested on the 7 elements of art. The purpose is to show the growth of the students throughout an entire quarter. Differentiated assessment strategies are recorded as evidence of what students learned and how they learned it. The students' growth is examined both in a group data setting and then divided between students who have taken art before and who have not. Those who had never taken art before showed a lower growth rate through the quarter than those who have taken art before in school. Those students who have not taken art before also have not had the same opportunity to develop the creative thinking and critical thinking abilities like those who had taken art classes all throughout school.

Presenter(s)-Major: **Marco Beltran - Process Systems Technology, Briana Kassebeer - Process Systems Technology**
Title: AUTOMATED ELEVATOR MODEL
Department: Western Colorado Community College
Sponsor: Martin Chazen

Abstract: Most Americans know the basic functions of an elevator but not many Americans know about what goes on behind the scenes. In this project we will be demonstrating how an elevator works properly with its various mechanical and electrical functions. Furthermore, we will also showcase how a programmable logic controller is used to control the elevator and all its key components. We will be constructing this model elevator completely from scratch using various tools and materials. Additionally, we will use the programming logic controller to control the motor and the movement of the elevator car. With this project we hope to demonstrate the inner workings of an elevator.

Presenter(s)-Major: **Oliver Berg - Spanish-Applied Professional, Corey Jimerson - Business Administration-Finance, Edith Rico - Liberal Arts-Early Childhood Education, Melba Viera - Spanish-Applied Professional**
Title: CERVECERÍA TIBURÓN GAYARRE
Department: Languages, Literature & Mass Communication
Sponsor: Mayela Vallejos-Ramirez

Abstract: For this project, the steps to create a hypothetical restaurant business in Southern California will be presented. The presentation will focus on the finance, marketing, and day-to-day operations as well as the brewery and cuisine. The motivation behind Cervecería Tiburón Gayarre (Bullshark Brewery) comes from the desire to share the microbrewery culture with the Hispanic population. Therefore, this restaurant will feature traditional as well as Hispanic flavored brews accompanied with American

and Hispanic entrees from burgers to ceviche. As fans of the art of microbrewery and the vivacious culture of Latin America, the Cervecería Tiburón Gayarre team is proud to create this experience for the merging of these cultures. This presentation will be given in Spanish.

Presenter(s)-Major: **Alexander Bernholtz - Nursing-BSN, Chelsea Lyons - Nursing-BSN, Tracie Oller - Nursing-BSN, Kristina Schumacher - Nursing-BSN**
Title: EFFECTIVENESS OF EDUCATIONAL VIDEOS AMONG NEWLY DIAGNOSED TYPE 2 DIABETIC ADULTS OF LOW-SOCIOECONOMIC STATUS
Department: Health Sciences
Sponsor: Bridget Marshall

Abstract: Purpose: A research proposal to evaluate the effectiveness of educational videos on type 2 diabetes mellitus (DM2) administered with discharge instructions in individuals with low-socioeconomic status who have been newly diagnosed with DM2. Problem Statement: Diabetes is increasing in the United States. Early education has shown to be effective on increasing diabetic self-care and improving disease management. Individuals with low-socioeconomic status have a higher rate of low health literacy which is linked to low diabetic self-care. Research Question: Does the integration of educational videos along with spoken and written instructions for DM2 discharge education increase understanding of the disease state in newly diagnosed adults aged 18 years and older of low socioeconomic status, as evidence by a pre and post-test Literacy Assessment for Diabetes (LAD) and prospective A1C levels every three months for five years? Methodology: This longitudinal cohort study will sample newly diagnosed DM2 patients of low-socioeconomic status enrolled in state Rocky Mountain HMO (RMHMO) in Mesa County. A LAD will be distributed prior to and following viewing of an educational video. The participants will be followed for five years and the patients' A1C levels and LAD will be measured periodically to determine the effectiveness of the intervention.

Presenter(s)-Major: **Courtney Bickley - Business Administration-Finance, Karl Biddison - Business Administration-Finance, Harrison George - Business Administration-Finance, Sarah Salazar - Business Administration-Finance**
Title: THE FINANCIAL HEALTH OF THE TOP TECHNOLOGY PLAYERS
Department: Business
Sponsor: Morgan Bridge

Abstract: With the development of personal and industrial consumer electronics, the technology industry began to gain a wide recognition with the public in the 1990's. With the expansion of major research and development to new products, and a large advancement in current electronic technology in the early 2000's, the industry became a main stream entity. Having a larger consumer appeal and wide base of products to develop, the industry grew at an expedient rate. In the fast-paced technology sector of today, there are a vast amount of companies that continue to develop and reevaluate new and currently existing products to remain competitive in the market. Within this industry, the four companies that will be looked into further are Apple Inc., Microsoft, Google, Hewlett Packard. We will present the current financial status of these groups, and what their outlook is for the next few years. Those who attend this presentation will leave with a satisfaction of knowledge for the outlook in this industry in regards to the four companies mentioned above in order to stay updated and relevant in the technology industry field. Since this field touches almost every facet of our lives, understanding the future solvency and outlooks will allow for our audience to make informed decisions about future technological use with these companies.

Presenter(s)-Major: **Taylor Biner - Business Administration-Finance, Amanda Gonzalez - General Accounting, Travis Hackbarth - Business Administration, Meghan O'Brien - Business Administration-Finance**
Title: A BREAKDOWN OF PORTER'S FIVE FORCES IN THE PHARMACEUTICAL INDUSTRY
Department: Business
Sponsor: Morgan Bridge

Abstract: The research will show that Porter's Five Forces play heavily on the operations and management of large-scale pharmaceutical companies. These forces must be taken in to account when making both day-to-day and long-term decisions. While all forces are present with in the industry, certain forces have a larger impact on management decisions. Management must consider all factors in order to maximize their business strategy while staying within the guidelines of the law.

Presenter(s)-Major: **Matthew Bjornestad - Process Systems Technology, Michael Miller - Technology Integration-Network Technician, Elijah Waterhouse - Mechanical Engineering Technology**
Title: ADVANCED PORTABLE CHARGING TOOLBOX WITH BLUETOOTH CONNECTIVITY
Department: Western Colorado Community College
Sponsor: John Sluder

Abstract: This prototype is the fabrication of a toolbox that is designed to charge tools without being plugged into an external power supply. The purpose of this project is to create a toolbox for contractors and handymen who have an imperative need to keep their tools charged and organized at all times. This box has been designed to charge a variety of tools from any manufacturer. The batteries will charge via an internal battery system and a small solar panel located on the top of the toolbox. This system will provide power for a full day or more. The system will be able to monitor the battery's charge status with an application directly from a smart phone. Using that same application you will be able to Bluetooth music from a smart phone to the sound system located in the box. In conclusion, our goal with this box is to provide a toolbox for people on the go who rely on having their tools charged when they're ready to use them.

Presenter(s)-Major: **Matthew Bjornestad - Process Systems Technology, Thomas Duffy - Process Systems Technology**
Title: PROGRAMMABLE LOGIC CONTROLLER (PLC) EXECUTED PUMP-AROUND SYSTEM
Department: Western Colorado Community College
Sponsor: Martin Chazen

Abstract: Industrial processes have become increasingly complex as companies seek to safely and efficiently develop high quality products that consistently exceed the customer's expectations. Quality systems, such as the International Standards Organization (ISO) 2000, require an adherence to strict production criteria in order for a company to remain competitive in the global market. This project aims to demonstrate the benefits of using automation through a PLC to effectively control repetitive industrial process systems in a way that consistently meets industry standards. Using a PLC and Human Machine Interface (HMI) that are programmed using ladder logic, this project will demonstrate how automation can be applied to monitor liquid level sensors and control pumps and solenoid valves to systematically and concisely move fluids through a series of storage tanks, thus simulating procedures common in the process industry. The proliferation of PLCs is enabling industry to meet stringent production standards in a safe and economical manner.

Presenter(s)-Major: **Justin Blaskowsky - Biological Sciences-Biology, Leah Temple - Biological Sciences-Biology**
Title: THE EFFECTS OF CAPSAICIN ON *Thamnophis elegans* METABOLISM
Department: Biological Sciences
Sponsor: Paul Hampton

Abstract: Capsaicin (CAP), the active compound in chili peppers, has been long suspected to increase metabolism. Many homeopathic compounds containing capsaicin claim to increase metabolic rates. The effects of the compound have been extensively studied, but solely in mammals. In recent studies, CAP has been thought to have similar action as epinephrine, a beta-adrenergic agonist. These neurotransmitters are responsible for dilating smooth muscle tissue, which cause increased respiration rates and O₂ consumption. It is unclear however if CAP acts as a beta-adrenergic agonist or simply stimulates the production of epinephrine due to a sympathetic nervous response (fight or flight response). Snakes do not have CAP receptors, which removes pain and epinephrine production and subsequently the possibility of a sympathetic nervous response, making them an ideal study organism to measure the direct effects of capsaicin on metabolic rates. We will be feeding western terrestrial garter snakes (*Thamnophis elegans*) mice with and without capsaicin present and measuring their metabolic rates after eating (measured by O₂ consumption). Using a paired t-test, we will be determining if there is a significant change in metabolic rates that can be contributed to capsaicin ingestion.

Presenter(s)-Major: **Jaclyn Blumberg - Nursing-AAS, Jaycee Kendall - Nursing-AAS, Lindsey Kenworthy - Nursing-AAS, Shawna Watkins - Nursing-AAS**
Title: EFFECTIVE CARE TEAM COMMUNICATION AND ITS INFLUENCE ON PATIENT OUTCOMES
Department: Health Sciences
Sponsor: Genell Stites

Abstract: Effective communication is pivotal in positive patient outcomes. A lack of information or breakdown in the communication chain has the potential to cause errors in patient care, some of which could have catastrophic outcomes. This presentation will provide information on the various forms of communication used in the healthcare field. Evidence-based communication strategies will be presented along with survey data showing the preferred methods, gaps in communication, strategies for improving and the effects of communication breakdown on patient care in various healthcare settings. Although this

presentation primarily focused on the communication between physicians, nurses, and certified nurse aides, any member of the healthcare team will find this informative.

Presenter(s)-Major: **Jacob Bollinger - Mechanical Engineering, Marc Brandt - Mechanical Engineering, Taylor Schwartz - Mechanical Engineering, Alexander Weaver - Mechanical Engineering**
Title: PHOTOELASTIC STRESS ANALYSIS
Department: Physical & Environmental Sciences
Sponsor: Jody Kliska

Abstract: In today's materials, it is important to understand where and how they are impacted by stress and how stress is distributed throughout an individual item. This project will provide a visible representation of stress and where and how it occurs. The designers will visualize the distribution of stress by putting a clear, transparent object between a polarized window and light source. The polarization will only allow waves of light parallel to the Polariscopes to pass. This causes bent light to be seen as stress shifts in the material and changes the index of refraction. How light bounces off the material, and the concentration of the colors can be interpreted as the concentration of stress. Ultimately, the designers will compare photo elasticity to finite stress analyses to show the distribution of stress.

Presenter(s)-Major: **Mark Boomgaard - Computer Information Systems, Ryan Raimer - Computer Information Systems**
Title: FLEET MANAGEMENT
Department: Business
Sponsor: Gayla Slauson

Abstract: The goal of this project is to create a Fleet Database to mine data in order to make meaningful recommendations to SkyBeam Management. Professor Gayla Jo Slauson, has created an opportunity as a part of CISB 306 Solving Problems Using Databases, to help practice our newly acquired Microsoft Access skills. The audience should be able to effectively use the Microsoft Office Suite, specifically Microsoft Access. The queries, reports, and forms found within the Fleet Database help to describe the current state of drivers and vehicles within SkyBeam. The results mined from the Fleet Database will aim to give helpful management information about all areas tracked by the Fleet Database. The data found within the Fleet Database used properly can improve daily operations at SkyBeam. The intended audience for this project is SkyBeam Upper Management.

Presenter(s)-Major: **Brittany Bosshardt - Graphic Design-Visual Design, Ajalique Chapman - Graphic Design-Animation and Motion Graphics**
Title: YOUNG DESIGNERS
Department: Art
Sponsor: Suzie Garner, Eli Hall

Abstract: ICMAD is a cosmetic company and each year they ask schools to submit cosmetic package designs. This year fifteen schools entered the competition and 85 students submitted package designs. The top three designs and two honorable mentions were selected from the submissions. One Colorado Mesa student placed second and another received an honorable mention.

Presenter(s)-Major: **Bailey Bowman - Business Administration, Theadora Rotbasean - Hospitality Management, Cornelius Tsipai - Business Administration**
Title: HIGH COUNTRY RESORT AND SPA
Department: Business
Sponsor: Britt Mathwich

Abstract: This semester project for Hospitality Management (HMGT 450) includes a six phase design, development, and marketing plan for a hypothetical resort. Nestled between the Rocky Mountains and the Arkansas River, High Country Resort and Spa is a special place where you can explore the best of Colorado with incomparable luxury and unspoiled wilderness. This high end resort is next to Clear Creek in Idaho Springs, Colorado and offers adventure such as rafting and tubing down the river, camping in luxury tents, and zip-lining across the mountains. This presentation will cover three of the six phases of resort design and the resort marketing plan. First, the resort concept, including the theme, target market, and competition will be discussed. Second, the presentation will differentiate this resort from the competition by explaining the luxury amenities and accommodations. Third, the team will discuss the space it will take to make this possible and any other considerations that will play a role in the development and design of High Country Resort and Spa. With the help of investors, Idaho Springs is looking at a resort that will bring with it new experiences and new adventures to spark a new love for Colorado and wilderness.

Presenter(s)-Major: **Rachel Boyce - Theatre Arts-Music Theatre**
Title: A PERFORMANCE OF "YOUTH" FROM RACHEL BOYCE'S CABARET: HARDLY CINDERELLA
Department: Theatre Arts
Sponsor: Jeremy Franklin

Abstract: "Hardly Cinderella" is a full-length semi-autobiographical cabaret written and performed by Rachel Boyce with piano accompaniment by Douglas Morrow. Rachel will sing "Youth" by Daughter and will accompany herself. The full cabaret explores the inevitable and often difficult path from childhood to adulthood. It centers on a young woman's journey and her battles between wide-eyed expectations and the harsh realities she encounters instead. Using passages from literature, original writings, and music adapted from musicals and popular culture, the audience will witness the performer deal with love, loss, making ends meet, and the eternal question of purpose. This cabaret is used as a vehicle to connect with others and show that perhaps we're not as alone as we feel.

Presenter(s)-Major: **Alexander Boyle - Mechanical Engineering, Brandon Castle - Mechanical Engineering, Nicole Rooney - Mechanical Engineering, Jacob Wallace - Mechanical Engineering, Matthew Wood - Mechanical Engineering**
Title: PELTIER POWERED LAMP
Department: Mechanical Engineering Partnership Program, Colorado Mesa University and University of Colorado Boulder
Sponsor: Nathan McNeill

Abstract: Have you ever wanted to turn on a lamp that is not plugged into the electrical grid? With the use of a Peltier device, this is possible. The Peltier device will be used to generate an electrical current from a differential temperature source. The Peltier device will transform thermal energy into electrical energy via a thermal conducting device consisting of a superconductor. The device will produce a direct current instead of an alternating current. The designers will use the output of DC current to power a light bulb in a lamp.

Presenter(s)-Major: **Cody Boyle - Environmental Science and Technology, Taryn Brahmsteadt - Environmental Science and Technology, Sheila Cloud - Environmental Science and Technology, John Woods - Environmental Science and Technology**
Title: RECLAMATION PLAN FOR THE THREE SISTERS PARK IN GRAND JUNCTION, CO
Department: Physical & Environmental Sciences
Sponsor: Deborah Kennard

Abstract: The Three Sisters Park near the Tabeguache trailhead was purchased by the Mesa Land Trust in 2012 and deeded over to the City of Grand Junction to be conserved as a public open space under a conservation easement. In the 1970s-1980s, a road was established to access a small mine. Locals used the area for recreation purposes, such as shooting, four-wheeling, and jeeping. Rills and gullies formed due to the road, and further degradation is a concern in the area. The goal of this project is to design a reclamation plan that addresses the impacts of the old coal mine road, erosion, invasive species, aesthetics, possible coal mine tailings, and recreation of the park. Using the data from soil samples and vegetation analysis, a restoration plan will be developed to restore soil stability, hydrologic function, and biotic integrity. Soil samples will be taken in order to determine whether pollution from the mine is a concern, and vegetation will be analyzed to determine ideal ground cover and plant community composition. The plan will include potential remediation of gullies, and strategies to divert individual rills to reestablish proper hydrologic function.

Presenter(s)-Major: **Alexander Brahmsteadt - Exercise Science, Alexandra Millard - Chemistry**
Title: THERMAL DECOMPOSITION OF ISO-ALPHA ACIDS
Department: Physical & Environmental Sciences
Sponsor: Tim D'Andrea

Abstract: Hops are the female cone of the hop plant, *Humulus lupulus*, and are commonly used as a flavor stabilizer in beer to balance the sweet flavors. The flowers contain alpha acids that isomerize into iso-alpha acids during the brewing process, which provide a bitter flavor. In fact, beer bitterness is measured using the International Bittering Unit (IBU), which is the part per million concentration of iso-alpha acids present. These iso-alpha acids are known to degrade over time with temperature and light exposure ultimately changing the beer's flavor profile; however, the exact mechanism and reaction rates of the decomposition are not fully understood. Using high-performance liquid chromatography (HPLC) and the method of internal standards, the degradation rates of iso-alpha acids at different temperatures are investigated in order to determine rate constants and calculate an activation energy. These results will provide a better understanding of the shelf life and ever-changing chemical composition of beer.

Presenter(s)-Major: **Jaclynn Brand - Liberal Arts-Elementary Teaching**
Title: FIRST GRADE CROSS-CONTENT ASSESSMENT ANALYSIS
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: A teacher candidate at Colorado Mesa University has explored assessment types and evaluation of diverse students across three content areas. A variety of assessments were used for units in math, social studies, and literacy. The units included a pre-assessment, a post assessment, and a variety of formative assessments throughout a course of a few weeks with a first grade class. Evaluation of the assessments was disaggregated by birthday. Analyzing the growth of students based on age will give the researcher data on how the age children start kindergarten impacts learning even into first grade (and possibly beyond). The teacher candidate questioned the effect of age on academics across content areas. The project was meant to understand assessment analysis and gain a better understanding of development of first grade students.

Presenter(s)-Major: **Jaclynn Brand - Liberal Arts- Elementary Teaching, Danielle Sloan - Liberal Arts-Elementary Teaching, Nicole Thornton - Liberal Arts-Elementary Teaching**
Title: A CASE STUDY OF STEM AND EXPERIENTIAL LEARNING: PROMOTING STUDENT LEARNING, TEACHER DEVELOPMENT AND PARENT AWARENESS
Department: Teacher Education
Sponsor: Jennifer Daniels

Abstract: The purpose of this study is to identify what parents, teachers, pre-service teachers, and administrators know about STEM and Experiential Learning and to what extent do they feel the need for this type of education in kindergarten through eighth grade. The research hypotheses is that the majority of parents will identify STEM as stem cell research instead of inquiry based science, technology, engineering, and math and that they will not understand what experiential learning is but will agree that their children should have this component as part of their education. The team hypothesized that teachers and pre-teachers will know what both STEM and Experiential Learning are but may not want to spend time on these teaching strategies due to lack of time with their students. The team hypothesized that school principals will understand both strategies and will see a need for them, however, depending on funding, may not prioritize them.

Presenter(s)-Major: **Bradley Brandenburg - Business Administration-Finance, Melissa Camilletti - Business Administration-Finance, Joseph Jonely - Business Administration-Management, Matthew Jones - Business Administration, Kristyn Wykert - Business Administration-Finance**
Title: FINANCIAL ANALYSIS
Department: Business
Sponsor: Morgan Bridge

Abstract: The group will be conducting and presenting a financial analysis on the entertainment industry. The companies that will be involved in the analysis includes: Disney, IMAX, Lions Gate, Time Warner, and 21st Century Fox. The companies will be compared with each other in an attempt to determine each competitor's financial situation.

Presenter(s)-Major: **Taylor Brantley - Business Administration-Management, Barak Cupp - Business Administration-Marketing, Braunson Kalan - Business Administration-Management, Samantha Moody - Business Administration-Management, Sean Robbins - Business Administration-Marketing**
Title: SHE HAS A NAME
Department: Business
Sponsor: Tim Hatten

Abstract: This senior marketing group created a marketing campaign for the non-profit organization "She Has A Name." This organization is based out of Grand Junction, CO and travels to Nairobi, Kenya to rescue women from the sex trafficking industry. According to the organization, it is "is a ministry designed to identify and rescue child prostitutes of the Mathare/Huruma slums. We will seek to deliver specific girls from a life of disease, deprivation, humiliation, hopelessness, education, spiritual growth and networking." The marketing team set a goal for the marketing campaign to utilize media channels that spread awareness globally about human trafficking. The team hopes that this campaign leads to individual action that will eventually sustain non-profit organizations.

Presenter(s)-Major: **Patrick Breidel Jr - Business Administration-Landman/Energy Management, Lacy Browning - Business Administration-Finance, Sean Foster - Business Administration-Finance, Daniel Guzman-Padilla - Business Administration-Finance, Estevan Palma - Business Administration-Economics**
Title: LEVERAGING STRATEGIES IN THE ENERGY INDUSTRY
Department: Business
Sponsor: Morgan Bridge

Abstract: This presentation will focus on the use and application of leveraging strategies to help ease the effects of price and market fluctuations in the energy industry.

Presenter(s)-Major: **Calvin Brewer - Computer Science, Brandon Foss - Computer Science,**
Title: DYNAMIC BUSINESS MANAGEMENT SOFTWARE
Department: Computer Science, Mathematics & Statistics
Sponsor: Warren MacEvoy

Abstract: The student development team worked with a local nail salon to develop software that facilitates client, contractor, and services management. With the salon's ambitions for growth in the near and long term, developers implemented a system that empowers the client to manage these aspects of the business from the salon computer or from a web interface, accessible with authentication from anywhere. The development team implemented the salon desktop application using the Java programming language. The web interface is implemented as a MEEN Stack, which includes Express, Ember, and Node.js. Both the Java desktop application and the web interface connect to a shared database, created with MongoDB. The developers created a custom User Authentication API with encryption to interact with the shared database. Changes made through the Java or web application--such as alterations to services, clients, or contractors--are dynamically loaded on the business website.

Presenter(s)-Major: **Michael Brink - Geology**
Title: A GEOCHEMICAL ANALYSIS OF THE ORIGIN AND RELATION OF GRAND MESA BASALTS TO BASALT FLOWS IN WESTERN COLORADO
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

Abstract: The Grand Mesa is a prominent topographic feature in western Colorado whose geochemical fingerprint can aid in determining the origin of this ~10 million year old volcanic basaltic flow. The Grand Mesa is one of many volcanic basaltic flows present in northwestern Colorado. Previous geochemical analyses of basalt flows deposited adjacent to and in the Glenwood Springs volcanic field in west-central Colorado have provided valuable data pertaining to the chemical make-up of these basalts. By acquiring and utilizing similar geochemical data from Grand Mesa basalts and comparing these data to previous studies a determination can be made as to the origin of these basalts based on similarities/differences in their chemical compositions. Specifically, trace element and geochemical data, including trace element (rare earth element) ratios and total alkali-silica (TAS) plots, acquired from the Glenwood Springs volcanic field are significant in making these determinations. Through analysis of these and additional geochemical data from Grand Mesa basalts, this project aims to determine the origin and relativity of Grand Mesa basalts to other basalt flows in west-central Colorado, and the possible significance of the methodology used to make these determinations.

Presenter(s)-Major: **Michael Brink - Geology**
Title: EXAMINATION OF A MAGNETIC ANOMALY AT GRAND MESA COLORADO AND POSSIBLE GEOLOGIC IMPLICATIONS
Department: Physical & Environmental Sciences
Sponsor: Verner Johnson

Abstract: Aeromagnetic surveys conducted throughout the United States have recorded variations of intensity in the Earth's magnetic field. Many types of rocks and minerals are weakly magnetic and can cause disturbances, or anomalies, in this magnetic field. Aeromagnetic maps of Colorado reveal a high magnetic anomaly at Grand Mesa, in western Colorado. Several remote magnetic sensing methods have been utilized to help interpret similar anomalous occurrences which have provided useful information about subsurface geology. However, these magnetic sensing methods are highly subjective to interpretation. Field data locations for this project were acquired with a Garmin GPS unit and a proton precession magnetometer was used to attain magnetic readings. These data were used to produce spline/IDW interpolated maps in ArcGIS. The purpose of this project was to acquire magnetic measurements of Grand Mesa for analysis to confirm or refute the existence of the magnetic anomaly by comparing/contrasting ArcGIS maps to previous aeromagnetic maps and to determine possible geologic implications of the anomaly.

Presenter(s)-Major: **Hayley Brookshire - Nursing-BSN, Lori Goehl - Nursing-BSN, Lauren Kientz - Nursing-BSN, Jenna Newman - Nursing-BSN**
Title: NURSE PERCEPTION OF SOCIAL MEDIA'S INFLUENCE ON CAREGIVERS' DECISION TO VACCINATE THEIR CHILDREN
Department: Health Sciences
Sponsor: Beverly Lyne

Abstract: Vaccinations are an important part of community health and nurses are responsible for providing patients with accurate vaccine information. In today's society, the use of social media is extremely prevalent (Lee Rosenthal, and Scheffler, 2013). There are many studies that have shown that social media does affect healthcare choices, including vaccination practices (Austvoll-Dahlgren & Helseth, 2011; Buchanan & Beckett, 2014; Cates, Shafer, Park, Diehl, & Deal, 2011). Many caregivers refuse vaccinations for their children for various reasons. Without vaccines, infectious disease will take the lives of many individuals. There have been many studies that have investigated parental reasons for choosing not to vaccinate and what influences their vaccination choices. However there are no studies that investigate nurses' perceptions on social media's influence on caregivers' decisions to vaccinate their children.

Presenter(s)-Major: **Cassandra Brose - Nursing-AAS, Hannah Jackson - Sociology, Stephanie Kubick - Nursing-AAS, Nikki Wallace - Nursing-AAS**
Title: FALL RISK PREVENTION AND INTERVENTION STRATEGIES IN PATIENT-CENTERED CARE
Department: Health Sciences
Sponsor: Genell Stites

Abstract: The incidence of falls, fall-related injuries, and fall-associated costs continue to rise in a multitude of health care settings. Fall prevention programs designed for the aging population are implemented in most healthcare facilities in an attempt to address this problem. Prevention programs vary widely, ranging from single intervention strategies to comprehensive multi-factorial approaches. This article presents a review of several facility specific protocols and intervention strategies in place to manage this issue relative to patient-centered care. The purpose of this review is to assess the effectiveness of fall prevention programs in two types of facilities that provide care to older patients whom are at greatest risk for falls. The facilities of focus include a local clinical hospital setting and the environment of a long-term care facility. Utilizing the nursing process of assessment, diagnosis, planning, implementation, and evaluation evidence of fall intervention efficacy is analyzed within clinical healthcare facilities. The following article will describe patient-centered care findings related to similarities, deviations from the norm, and effectiveness of implemented protocols and strategies.

Presenter(s)-Major: **Megan Brown - Mechanical Engineering, Clancy Garoutte - Mechanical Engineering, Danae Lanigan - Mechanical Engineering, Robert VanRoosendaal - Mechanical Engineering**
Title: PELTIER DEVICE DEMONSTRATION
Department: Mechanical Engineering Partnership Program, Colorado Mesa University and University of Colorado Boulder
Sponsor: Nathan McNeill

Abstract: A working Peltier device demonstration was designed and fabricated to demonstrate the principles of thermoelectric heat pumps. The design consists of two heat exchangers attached to each side of the thermoelectric module and a fan. A power supply converts current from AC to DC and provides power to the thermoelectric module. The thermoelectric module then transfers heat from one side of the device to the other and creates a cooling element for an application. The theoretical coefficient of performance was calculated from thermodynamic and heat transfer principals and compared to the measured coefficient of performance.

Presenter(s)-Major: **Kelly Bryant - Chemistry**
Title: MICROSCOPIC ANALYSIS OF POSTMORTEM ROOT BANDING
Department: Social & Behavioral Sciences
Sponsor: Melissa Connor

Abstract: Postmortem root banding, or the formation of a dark band located near the hair root of a decedent, occurs only after death. This information is useful to forensic analysts because it could potentially reveal whether hair collected from a crime scene was a postmortem loss from an individual. In this research, conducted over a five-week period, hair samples were collected from human cadavers laid directly on soil. The cadavers were of varying time periods when the five-week study began. Data collection included hair that was photographed and analyzed using a compound microscope, and temperature data collected with a HOBO weather station placed on-site. This study will attempt to determine whether a trend can be observed between temperature and band formation.

Presenter(s)-Major: **Meredith Bryson - Nursing-AAS, Melissa Humphrey - Nursing-AAS, Jill Vetere - Nursing-AAS, Theresa Wall - Nursing-AAS,**
Title: THE ELECTRONIC HEALTH RECORD
Department: Health Sciences
Sponsor: Genell Stites

Abstract: This presentation focuses on the electronic health record (EHR) and whether it has a positive or negative impact on healthcare today. The EHR system impacts individuals differently. For example, for a provider it can complicate charting but for a nurse it can simplify reading a doctor's hand written order. As a patient the EHR can allow access to personal health information previously unavailable. The EHR enables electronic communication with the provider/practice. However, easier accessibility for the patient also means easier accessibility to those who want to misuse that same information.

Presenter(s)-Major: **Joseph Buches - Mechanical Engineering Technology, Cody Dozoretz - Mechanical Engineering, Dalton Hamer - Applied Mechanical Engineering, Trenton Ingram - Mechanical Engineering, Heather Mayerle - Mechanical Engineering**
Title: VAPOR CARBURETOR
Department: Physical & Environmental Sciences
Sponsor: Jody Kliska

Abstract: This project will build and test an alternative carburetor on a small engine. Instead of a traditional carburetor, a vapor carburetor will be used. The vapor carburetor is supposedly more efficient and more environmentally safe. The idea is for the intake charge to be composed of gasoline vapor instead of gas droplets. Since the vapors of gas are what combust, this carburetor should be very efficient compared to the droplets that slowly turn to vapor and don't usually combust completely. The new carburetor will consist of a canister filled with gasoline that produces vapors that are mixed with air and consumed by the engine. The fresh air intake hose siphons air through the gasoline, causing quicker and more evaporation. These vapors are pulled into the engine through the fuel intake hose, resulting in a cleaner burning, more efficient engine. The designers will show proof of efficiency of the new vapor carburetor through comparison to a normal running engine.

Presenter(s)-Major: **Peter Buchholz - Manufacturing Technology-Machining**
Title: UNMANNED AERIAL SYSTEM DATA COLLECTION
Department: Western Colorado Community College
Sponsor: Bill McCracken

Abstract: Unmanned aerial vehicles (UAV) and unmanned aerial systems (UAS) are becoming more and more prevalent nationally and globally. The key to UAS is data collection. This project will address the use of UAV and UAS in search and rescue, agriculture, and the monitoring of natural disasters. The project will incorporate the new design of components added to the UAV for data collection, utilizing the technologies available at CMU/WCCC such as 3D-printers and design software.

Presenter(s)-Major: **Chelsea Bullock - Liberal Arts-Elementary Teaching**
Title: DO AFTER SCHOOL CARE PROGRAMS HAVE AN EFFECT ON STUDENT'S ACADEMICS?
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: This project addresses whether after school care programs have an effect on an elementary student's academics. A pre- and post-test was conducted and the data was then analyzed based on if the students were in the after school program or not. This information will be used to help determine if there needs to be more of a focus on academics in the after school care program. The data from three units was analyzed for patterns in academic success or failure. It is predicted that the students who are in the after school care program will have a pattern of less academic growth from pre to post data than the students who are not in the after school care program. This project is intended for both parents and teachers to gain more information about the after school program and if it has an effect on their children.

Presenter(s)-Major: **Austin Burns - Mechanical Engineering, Ty Sickels - Mechanical Engineering, Jesse Talley - Mechanical Engineering**
Title: SOLAR POWERED ROAD MARKER: DESIGN AND INSTALLATION ANALYSIS
Department: Mechanical Engineering Partnership Program, Colorado Mesa University and University of Colorado Boulder
Sponsor: Francisco Castro

Abstract: University of Colorado Mechanical Engineering students were given the opportunity to partner with Lightspeed Road Solar™ for the duration of the 2014-2015 academic school year. Lightspeed Road Solar™ is a manufacturer of solar powered road marker lights which utilize integrated solar panels and small batteries to power LEDs (Light Emitting Diodes) and are designed to replace road reflectors currently being used throughout the United States. The markers are one of a kind and offer customers a solid product designed to withstand snow plowing and survive harsh weather conditions. The design team's main goal was to provide Lightspeed Road Solar™ with engineering support in order to improve the quality of the company's in-road marker lights. This support ranged from an analysis of Lightspeed's current installation procedure, testing of different LED types, improving the design of the marker's components, and the development of various specifications for the marker's internal LEDs and battery. The project deliverables consist of selecting internal marker components, a redesign of key components within the marker, a prototype test marker, and a detailed installation manual which includes product specifications.

Presenter(s)-Major: **Paige Cadman - Master of Business Administration**
Title: INCIDENT REPORTING PROCESS FLOW
Department: Business
Sponsor: Donald Carpenter

Abstract: Hilltop Community Resources Inc. is a large and diverse non-profit organization. The Life Adjustment Program is a residential facility that houses traumatic brain injured adults. The incident reporting process for the program is unclear and unregulated. This research proposal seeks permission to move forward with the study on how to make the processes more clear, efficient, and easy to understand. The brief literature review intends to show there are existing studies and articles on the necessity of incident reporting and best practices within the industry. Eight prescribed research questions will be answered through an exhaustive literature review, client data, personal interviews, secondary source data, Visio swim lane process modeling, Arena simulation modeling, SPSS statistical analysis, and logical deductions. Included in this proposal is a timeline for milestone completion dates and a preliminary swim lane model based on the current understanding of the incident reporting process.

Presenter(s)-Major: **Shane Calomino - Baking and Pastry, Katie Davini - Culinary Arts, Kevin Klepzig - Hospitality Management**
Title: SUSTAINABLE CUISINE AND LOCAL FOOD
Department: Western Colorado Community College
Sponsor: Wayne Smith

Abstract: Mesa County is one of the richest environments in Colorado for agriculture. Palisade, for example, is a small town with a population of mainly farmers and farm hands. When the growing season is in full swing the small town produces enough fresh food to sustain most of the restaurants in the neighboring towns (especially Grand Junction). The fresh food being distributed throughout Mesa County at this time is much more affordable, more fresh, and healthier than the food that most restaurants use during the off season. The biggest benefit from using local food is keeping money local rather than spreading it to other states and/or countries. Statistics show that per every \$100 spent on local food, \$64 of that stays in the community. \$100 spent at a large chain restaurant only leaves about \$32 in the community. Sustainable Cuisine, by definition is a way of growing, shipping, processing preparing and eating foodstuff that doesn't deplete the natural systems that create that product. So in other terms, it is giving back to the earth what you took from it. The culinary students at Western Colorado Community College have been working diligently to make it happen in their kitchens. Last year they built gardens covered by a hoop house and a composting facility dedicated to making an impact on the way food in the kitchens were being used. Every piece of produce that doesn't get used in the school goes right out to the composting facility, the compost is then mixed into the soil in the gardens to help the plants throughout the growing process. No produce goes to waste, that is the key to sustainable cuisine. The whole concept of the garden and composting facility is to teach students how to not only get the most use out of your food as possible but to hopefully teach them that even restaurants can benefit from such a service.

Presenter(s)-Major: **Leah Campbell - English-Writing**
Title: THE "DREAM ENDING" AND MODERNISM IN NATHANIEL HAWTHORNE'S ALLEGORY "THE CELESTIAL RAIL-ROAD"
Department: Languages, Literature & Mass Communication
Sponsor: Randy Phillis

Abstract: This presentation shall demonstrate how the presenter makes sense of and analyzes a literary review written about a literary text. In other words, this presentation shall explain how the presenter either arrives at either agreeing or disagreeing with the opinions expressed within the review. Specifically, the presentation will focus on Joseph C. Pattison's review of Nathaniel Hawthorne's short story "The Celestial Rail-road," a tale often viewed and read as an allegory to John Bunyan's novel Pilgrim's Progress. In his review, titled "'The Celestial Railroad' as Dream-Tale," Pattison takes a different perspective in arguing that reading Hawthorne's story as an allegory makes it self-defeating; instead, he stresses the story must be read as dream-tale. While the story can easily be read as such, the tale must and should be read as an allegory, as readers must take into consideration both the historical and literary influences which not only shape the context of, but are present within "The Celestial Rail-road." By examining such factors while referring to Hawthorne's text, the audience shall come to understand the importance and process of analyzing a literary work under review, in order to formulate an effective reading and concise perceptions about a text's structure and message.

Presenter(s)-Major: **Leah Campbell - English-Writing**
Title: PRACTICING NEW HISTORICISM: SITUATING THE TEXT "RIGHTS OF WOMAN"
Department: Languages, Literature & Mass Communication
Sponsor: Randy Phillis

Abstract: There are numerous ways in which to read and interpret historical texts, or texts that are written outside of the time period and setting with which a reader is familiar. One way of viewing and garnering understanding of historical texts is via the lens of New Historicism, which stresses the importance of "situating" a text. To clarify, one must place the text within a specific historical context, or time and place. Doing this, one shall understand the attitudes, opinions, ideals, etc., regarding the message, issues and/or events the text addresses. Using this New Historicist approach, this presentation will "situate" the 1795 poem "Rights of Woman." Written by an anonymous female poet, the verses call out the irony that while the new nation of America prides itself as being founded on freedom and liberty for all, women still lack many basic rights. However, in order to further "situate," or understand the contemporary forces which shape the content of this text, this presentation shall also examine another contemporary work that addresses the debate of women's rights: Mary Wollstonecraft's "A Vindication of the Rights of Woman." By examining these two texts together, the audience shall come to understand how texts reinforce or subvert certain actions and attitudes.

Presenter(s)-Major: **Robyn Carmine - Liberal Arts-Elementary Teaching**
Title: READING AND MATH ASSESSMENT STUDY
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: The researcher of this project addresses the question of how much a classroom teacher relies on the results of one assessment to guide instruction. Knowledge that is gained from assessments is valuable in motivating and guiding teaching instruction in both classroom teachers and future teachers. This project was done to look at the data collected through formative, summative and computer diagnostic testing in both reading and math. The research will compare the results of these assessments to show how reliable various assessments are. Classroom teachers need to determine the accuracy of one assessment as compared to another. The intended audience for this project is classroom teachers, parents, and future teacher education students. This research will help teachers and teacher candidates understand how results from different types of assessments in both reading and math may vary and how a teacher uses that information to guide teaching instruction to help grow their students.

Presenter(s)-Major: **Ashley Carothers - Nursing-AAS, Cynthia Distel - Nursing-AAS, DeAnna Guymon - Nursing-AAS, Brigid Heckel - Nursing-AAS**
Title: BENEFITS VS RISKS TO THE PATIENT WHEN USING PATIENT PORTALS
Department: Health Sciences
Sponsor: Genell Stites

Abstract: Patient portals are a growing trend in the health care industry. Patients can access their personal health care information (PHI) from anywhere and at any time. With electronic medical records (EMR) patient care can be optimized by creating quicker access to information, decreasing storage of paper charts, decreasing misinterpretation of orders, producing accurate patient histories, and allowing faster coordinated care between facilities. Do the benefits outweigh the risks? Recently, cyberattacks have

been in the news with major retail stores, but the ones less heard of are cyberattacks on hospitals. In August 2014, Community Health Systems computer network was compromised and over 4 million patient's PHI were taken. Can this potentially cause harm to patients? When patients have access to medical records, it reduces the patients personal experience, can cause frustration, and patients can misinterpret data leading them to believe they have a potential crisis. EMRs can contain some very valuable information such as social security numbers, addresses, and even credit cards. Our goal is to inform patients and health care workers of the benefits and risks of using patient portals.

Presenter(s)-Major: **Danielle Carrillo - Theatre Arts-Acting/Directing, Kristina McLeslie - Psychology-Counseling Psychology, Tawni Middleton - Biological Sciences-Biology, Melissa Peterson - Biological Sciences-Biology, Justine Roof - Political Science**
Title: THE LIBERAL ARTS ON TRIAL
Department: Social & Behavioral Sciences
Sponsor: Adam Rosenbaum

Abstract: The term "liberal arts" typically refers to a variety of scholarly disciplines including literature, history, philosophy, and even certain types of science and mathematics. In some circles, the term is associated with subject matter that does not lead directly to a specific vocation. So what is the value of a liberal arts education? What do students stand to gain by understanding their specific majors as part of broader, interdisciplinary education that revolves around the liberal arts, broadly defined? In the interest of addressing these questions, the CMU chapter of Alpha Chi, the National College Honor Society, would like to put the liberal arts "on trial." More specifically, we will stage a mock trial centered on the examination and cross-examination of three expert witnesses: professor of history Doug O'Roark; professor of biology Aparna Palmer, and Director of Teacher Education Valerie Dobbs. We hope that this event encourages the CMU community to reflect on the important connections between different fields, as well as the broader skills to be gained through a well-rounded education.

Presenter(s)-Major: **Danielle Carver - Liberal Arts-Elementary Teaching**
Title: TEACHING PROFESSIONALLY
Department: Teacher Education
Sponsor: Jennifer Daniels

Abstract: This project examines what it means to be a teacher as a professional. It will examine thoughts and experiences of teachers who are still teaching and those who have left the educational system. It will document what researchers have observed about the professional and compare that to what teachers have to say. This project will examine specifically why people chose to become teachers and decide to leave teaching, what encourages some to stay and others to become leaders, and the routes people take to prepare for becoming a teacher. The project will then examine how this information will help someone become an educator themselves.

Presenter(s)-Major: **Megan Casey - Nursing-AAS, Samantha Holm - Nursing-AAS, Ariel Laurier - Nursing-AAS, Brittany Maynes - Nursing-AAS**
Title: HANDWASHING: HOW TO PREVENT THE SPREAD OF COMMUNICABLE DISEASE
Department: Health Sciences
Sponsor: Genell Stites

Abstract: Hand washing is vital to preventing diseases According to the NSA, 1 in 25 patients acquire an infection related to hospital care. According to the national nosocomial infection surveillance system, "1.7 million cases of HAIs and 99,000 associated deaths occurred in US hospitals each year" (2002). This presentation will demonstrate how organisms on an unwashed hand can be transmitted from one object to another allowing patients and health care workers to become infected. Although safe hand washing by one's self may be being practiced, others may not be practicing effective hand washing, contributing to the chain of infection without knowing it. This makes hand washing one of the most important steps in delivering care. The diseases that our patients acquire are preventable. Making everyone aware surfaces may harbor organisms is the first step in realizing how to break the chain of infection. Thus, it is so important for nurses to wash their hands before and after giving patient care.

Presenter(s)-Major: **Cory Castaneda - Business Administration-Economics**
Title: ALEXANDER HAMILTON'S ECONOMIC GENIUS
Department: Business
Sponsor: Nathan Perry

Abstract: Alexander Hamilton's vision and financial genius has shaped American history for the last 230 years. Hamilton's paying off of the Revolutionary War debt provided the U.S. with a strong credit rating, his creation of the national debt created bond

liquidity for financial institutions to prosper, and his creation of the first national bank set the stage for a stable banking system. All of these actions were meant to create U.S. financial, economic, and military strength. The purpose of this paper is to analyze Hamilton's genius and financial legacy, specifically in the context of the U.S. hegemonial position. The paper will also argue that Hamilton had a chartalist view of money (as opposed to a metalist view of money), and without this chartalist view would not have come to the same policy prescriptions as another secretary of the Treasury.

Presenter(s)-Major: **Alexia Chapman - Psychology-Counseling Psychology, Jair Epp - Spanish-Applied Professional, Stephanie Morley - Spanish-Applied Professional, Ana Pavon - Spanish-Applied Professional**
Title: THE INTEGRATION CENTER
Department: Languages, Literature & Mass Communication
Sponsor: Mayela Vallejos-Ramirez

Abstract: To demonstrate the skills taught in Business Spanish 433, the project "The Integration Center" attempts to recreate the steps it takes to start a business. This program is a charitable, non-profit organization with a main purpose of assimilating and incorporating Hispanic immigrants of all ages in all cultural, social, educational, and economic aspects in the community. The Integration Center, located in Grand Junction, offers workshops involving job acquisition skills, school structure and expectations, cultural customs, language classes, as well as basic resources to address necessities. The goal of this presentation is to highlight the steps it takes to start up and open a new business. This includes creating a business plan, locating funding, finding a location, hiring employees, structuring classes, and advertising to the public. The presentation of this business will be conducted in Spanish and will include the steps taken to be able to open the business successfully and explain the daily operations of the center. A center such as this is both a positive and necessary organization for our community, as supported by the evidence of this business plan. This presentation will be in Spanish.

Presenter(s)-Major: **Wesley Chapman - Mechanical Engineering, Franli Laubscher - Mechanical Engineering, Grant Miller - Mechanical Engineering, Denis Terzic - Mechanical Engineering, Evan Wilking - Mechanical Engineering**
Title: WHAT TIME IS IT?
Department: Physical & Environmental Sciences
Sponsor: Jody Kliska

Abstract: Everyone checks the time of day often. But nobody realizes the mechanical design that goes into keeping time. The purpose of this project is to demonstrate what kind of gearing is necessary to maintain the time of day. Six gears will be attached to a DC electric motor. Every gear will represent a specific unit of time. The final gear will be calculated to make one rotation every hour and it will be represented inside a clock frame. With this demonstration the project team will be able to tell time and demonstrate the process it takes.

Presenter(s)-Major: **Victoria Chavez - Mechanical Engineering, Nick Fischer - Mechanical Engineering, Keegan Kaiser - Mechanical Engineering, Sean Kennedy - Mechanical Engineering, Aaron Troxel - Mechanical Engineering**
Title: INTERNAL COMBUSTION ENGINE – VISUALIZING A GAS POWER CYCLE
Department: Mechanical Engineering Partnership Program, Colorado Mesa University and University of Colorado
Sponsor: Nathan McNeill

Abstract: The utilization of the internal combustion engine revolutionized the automotive industry upon its development in the 19th century. It has been seen in numerous applications and yet in comparison to modernized means of energy generation, is relatively inefficient. As a means of research, an internal combustion engine is designed and constructed in an expanded manner to allow for easier visualization of operation. With a fully automated interface, the system is able to inject propane fuel into a combustion chamber where ignition causes rapid pressure and temperature expansion further causing forces to drive a turbine. This turbine is what generates electricity which can be collected for use. Due to the "expanded" manner of construction, complete system measurements can be collected for thermodynamic analysis. As the engine can be defined as a gas power cycle, an overall efficiency for the engine is developed and optimization of the engine is performed. The operation of the system and its relative lack of complexity, will demonstrate why this method of energy generation has been preferred for the past century and why it will likely continue to be a preference in many industrial applications.

Presenter(s)-Major: **Tyanna Church - Geology**
Title: UNAWEEP CANYON ORIGINS: AN INVESTIGATION OF ANCIENT RIVER TERRACE GRAVELS NEAR MONTROSE AND DELTA, COLORADO
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

Abstract: The origin of Unaweep Canyon, which cuts through the Uncompahgre Plateau in western Colorado has perplexed scientists since the late 1800s. The size of the canyon has led to many theories about how Unaweep was carved. Evidence of volcanic and granite clasts initially proved the presence of the Gunnison River in Unaweep Canyon. But the recent discovery of brick-red siltstones in several terrace deposits near Gateway, Colorado has led some researchers to suggest that it was the Colorado River that carved Unaweep Canyon. To determine whether or not the Colorado River deposited these red siltstones, ancient sediments of other rivers such as the Uncompahgre and the Gunnison will be examined near the Montrose and Delta areas. Further investigation of Unaweep Canyon's ancient river history by studying the composition of ancient river gravels and detailed geographic analysis will not only aid in determining the origin of this puzzling canyon, but it will help us to determine which western Colorado river had the greatest impact on the canyon's down cutting.

Presenter(s)-Major: **Mayola Cisneros - Spanish-Applied Professional, Teryn Goulet - Spanish-Teacher Licensure, Olivia Higgins - Spanish-Applied Professional, Priscilla Perez - Psychology-Counseling Psychology, Amanda Willmarth - Spanish-Applied Professional**
Title: BELLEZA NATURAL (NATURAL BEAUTY STORE)
Department: Languages, Literature & Mass Communication
Sponsor: Mayela Vallejos-Ramirez

Abstract: The purpose of this project is to gain experience in business operations by developing a business proposal. By undergoing the tasks necessary to start a business, the group will acquire knowledge of how to interact with banks and the business world, along with the importance of entrepreneurship. Throughout this project the group will research and collect data on the following: leasing of a building, wholesale product costs and sale prices, employment wages, the startup costs of a business, types of loans available for businesses, marketing strategies and costs, as well as finance management. As a result of this project the group will present a completed business proposal for a small scale, organic beauty supply store. The presentation will demonstrate obtained knowledge through the process of starting a small business. This presentation will be in Spanish.

Presenter(s)-Major: **Lilli Clark - Geology**
Title: ANALYZING ANOMALOUS UNCOMPAHGRE PLATEAU BASALTS USING X-RAY FLUORESCENCE
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

Abstract: The Uncompahgre Plateau is a prominent Laramide uplift in western Colorado. Basalt boulders of unknown origin can be found at elevations between 8,500 and 9,500 feet near the Cottonwood Pass/Goddard Creek area southwest of Montrose, Colorado near the southeast end of the Uncompahgre Plateau. Little research has been completed on these boulders, and the source of the boulders is currently unknown. Outcrops of basalt are absent from the Uncompahgre Plateau as well as from the nearby northern San Juan Mountains. The purpose of this project is to chemically analyze basalt samples from Goddard Creek using a handheld Tracer III x-ray fluorescence unit in order to compare their chemical composition to the compositions of other basalts from Colorado. One possibility is that these boulders are remnants of the Hinsdale Formation, an Oligocene- to Pleistocene-aged mafic unit found in the San Juan Mountain region. Conversely, if these boulders are found to be unrelated to the Hinsdale Formation, then the Uncompahgre basalts were eroded from an independent and undocumented basaltic source. This research has the potential to provide important information about basalt deposits in western Colorado as well as the erosional history of the Uncompahgre Plateau.

Presenter(s)-Major: **Michael Clark - Psychology-Counseling Psychology, Steven McKinley - Psychology-Counseling Psychology, Rita Schenkelberg - Psychology-Counseling Psychology**
Title: PERCEPTIONS OF DESIRABILITY AND ATTRACTIVENESS FOR ONLINE DATING PROFILES WITH NON-MONOGAMOUS RELATIONSHIP CUES
Department: Social & Behavioral Sciences
Sponsor: Susan Becker

Abstract: The attractiveness and desirability of a relationship of online dating profiles were analyzed based on the presence or absence of non-monogamous relationship cues. This was done using a 3x2 experimental model. Six hundred students completed the experiment with 200 in each condition group. Many covariates were collected such as Right-wing Authoritarianism, Socio-Sexuality, the Big Five personality traits, and the Dark Triad. These covariates provide insight into the differing aspects of social

and evolutionary influences on dating and sexual relationships. Data suggest sex differences in attraction in line with evolutionary theory on mate selection.

Presenter(s)-Major: **Callahan Clarke - Biological Sciences-Biology, Bryenna Workman - Biological Sciences-Biology**
Title: SINGLE LARGE OR SEVERAL SMALL: PREY SIZE SELECTION AND ITS AFFECT ON LOCOMOTION OF RIBBON SNAKES
Department: Biological Sciences
Sponsor: Paul Hampton

Abstract: Previous studies of snake locomotion have illustrated that extra weight in the form of carrying offspring or ingested meals can significantly slow maximum speed and reduce endurance. Snakes primarily move by serpentine locomotion, creating lateral undulations and using push-points in their environment. Consequently, a rigid prey item may confound the adverse effects of a meal on locomotion by limiting the maneuverability. We hypothesized that consumption of several small fish will have less hindered movement of the spinal column compared to a single large fish. We chose western ribbon snakes (*Thamnophis proximus*) for our study. These are slender snakes that depend upon speed to avoid predation. Ribbon snakes were fed meals approximately 20% of the snake's mass. The large meal treatment was a single fish that was approximately 20% of the snake's mass. For the several small treatment, snakes were offered four fish that were each approximately 5% of the snakes size, thus totaling an equivalent meal size. After feeding, individuals were video-recorded while crawling through a track with push-points. Using Logger Pro, a motion-analysis program, we determined the flexibility of the spinal column with prey in their stomachs as well as maximum velocity.

Presenter(s)-Major: **Landon Clifford - Business Administration-Management, Kyle Davis - Business Administration-Marketing, Amelia Higgins - Business Administration, Laurel Kasel - Business Administration-Management, Eric Knickerbocker - Business Administration-Management, Taylor Mull - Business Administration-Marketing, Kaitlin VanRoosendaal - Business Administration-Marketing**
Title: AFPM RECRUITMENT CHALLENGE
Department: Business
Sponsor: Tim Hatten

Abstract: This project was established for the reasons of building awareness for the petrochemical and fuel industry, building awareness towards American Fuel and Petrochemical Manufacturing (AFPM) as a viable option for career opportunities. The target market is primarily millennials who are in either a four year, two year, or craft focused higher education programs. This campaign is also directed towards two other secondary target markets identified in in the situational analysis. More specifically, directed toward educated veterans and mid-career changers. This tactic was developed in response to skill being the main descriptor of the target market rather than age or other demographic identifiers. The primary research techniques to be used in this campaign are as followed: First will be administrating surveys to get a more analytical data regarding the target groups knowledge and perception of fuel manufacturing as well as the main factors that drive career decisions. Second will be focus groups targeted to the primary and secondary target markets to gather more detailed data on initial awareness of AFPM and the petrochemical industry. Third will be a confessional booth where respondents can answer certain awareness questions with no limitations. Building awareness will be mostly focused on a local level but with national integration ability. Holding an event at higher education institution will be the first step taken during the campaign to educate the target market about the petrochemical industry and AFPM in a unique and innovative way. In this process, cards with links and information will be handed out to connect the respondents with the social media site that our team has created. These links will be featuring AFPM information on the social media site Linked-In and provide them access to a job board that the team has created inform the public about jobs in the specific companies under AFPM and what benefits they are able to give. This campaign tactic will be modified for each target market depending on location and method best to reach maximum amount of target markets. To determine the effectiveness of this campaign the team will take the amount of participants that we have gathered at the event and those who visited the teams mock social media site and compare those with the amount of increase or decrease in the number of applications and contacts gathered. The overall expectation is that this project will spurt a growth in applications from the local population and at least gain contact information from willing candidates.

Presenter(s)-Major: **Faye Coats - Master of Business Administration**
Title: IMPROVING EFFICIENCY AT ST. MARY'S MEDICAL CENTER'S CENTRAL PHARMACY
Department: Business
Sponsor: Donald Carpenter

Abstract: The purpose of this research project is to understand the current operational practices in the central pharmacy at St. Mary's Hospital and Regional Medical Center in order to recommend improvements that can be made to these practices. The pharmacy already utilizes a software program for dispensing and storing medication at specific locations around the hospital.

However, the pharmacy has a problem with overall operational efficiency, which it would like to improve. Specific interest is placed on understanding how to improve inventory management and operational efficiency through lean processing and further utilization of automated systems. The pharmacy is a critical component to the overall successful operations of the hospital as it controls the main distribution and clinical services of drugs and medication. The main issue and subsequent research to be carried will be presented in the form of research questions. This author aims to be able to answer the research questions thoroughly using a number of methodologies: academic literature review, collection of internal and external organizational data, modeling simulation software, and statistical analysis software. This author concludes that research collected throughout this project can be used by the pharmacy to make informed decisions about changes to be made to ensure the pharmacy is operating efficiently.

Presenter(s)-Major: **Stephen Cochran - Manufacturing Technology - Machining, Cooper Parsons - Technology Integration, Clinton Pruitt - Process Systems Technology**
Title: SUPER CRITICAL CO2 HOPS EXTRACTION
Department: Western Colorado Community College
Sponsor: Bill McCracken

Abstract: The objective of this project is to fabricate and demonstrate a CO2 Super-critical process that extracts oil from hops and other plant based products. The goal is to create a closed system in which the oils can be extracted and the CO2 can be reused. The CO2 Super-critical process is less hazardous because extracts are produced with a natural solvent without residues, unlike other solvent extract processes. In our system, the super-critical state of the CO2 will be at 1700 psi and have a temperature of 30 degrees centigrade. At this state the liquid CO2 has properties of both a gas and a liquid and is a much stronger solvent, making it easier to extract the oils from the plants. In order to extract the oil the process will increase the pressure to 4000 psi with a temperature of 60 degrees centigrade. This temperature and pressure is needed for a set amount of time to adequately extract as much oil as possible, then the process will be moved to another chamber with much lower pressures and temperatures to retrieve the product.

Presenter(s)-Major: **Russell Coleman - History-Secondary Teaching**
Title: A PLUCKABLE FLOWER FOR YOUR PHALLUS CHALICE
Department: Social & Behavioral Sciences
Sponsor: John Seebach

Abstract: This assignment forced students to confront gender stereotypes and biases within popular American media advertising. After watching two older documentaries on the subject; Jackson Katz's Tough Guise and Jean Kilbourne's Killing us Softly: Advertising's Image of Women, students analyzed contemporary print advertisements to see if Katz's and Kilbourne's argument still hold up to scrutiny. Both argue that modern American society's expectations of gender specific behavior and appearance are molded by the advertising industry. Analyzing print ads in current magazines shows that their assertions are still valid. From the perspective of a History student in an Anthropology class, this project demanded to be taken further. While the project had students analyze older scholarship to see if there is a modern connection, the past demanded attention as well. Exploring this concept further resulted in a detailed historiography of scholarship relating to gender construction in advertising, which was added as an afterword. This research shows that the American marketing and advertising industries have molded and reinforced gender biases and stereotypes this way for generations. This project's aim is twofold: one to satisfy professional curiosity, and two, to reach across the History and Anthropology departments, disciplines that should be inseparable in any university.

Presenter(s)-Major: **Kilian Collins - Environmental Science and Technology, Dakota Klossner - Environmental Science and Technology, Eric Krueger - Environmental Science and Technology, Tyler Rust - Environmental Science and Technology**
Title: POST TAMARISK REMOVAL BASELINE DATA COLLECTION FOR BASIC FLOW, SEDIMENTATION, CHANNEL, VEGETATION, AND SOIL PROCESSES OF NO THOROUGHFARE WASH
Department: Physical & Environmental Sciences
Sponsor: Deborah Kennard

Abstract: Extensive tamarisk removal projects have occurred along many streams in the southwestern United States with a relatively small amount of data being gathered in regards to the alterations of the channel structure and function following removal. No Thoroughfare Wash, located south of Grand Junction, CO, is an ephemeral tributary of the Colorado River which saw extensive tamarisk removal in December of 2014. The goal of this study is to collect baseline data for channel morphology and perform basic flow, sedimentation, and floodplain analysis to support future channel and floodplain restoration decisions. Channel morphology will be established by conducting cross-sectional and profile view surveys. HEC-RAS modeling will be used to analyze sedimentation and flow patterns. In addition, vegetation (percent cover and species richness) and soil surveys (soil stability, salinity, and conductivity) will be used to help guide future restoration decisions. Establishing this baseline data will help to quantify the impacts of tamarisk removal along semi-arid ephemeral stream channels.

Presenter(s)-Major: **Hannah Cook - Nursing-AAS, Raelynn Hilgenfeld - Nursing-AAS, Amber Olson - Nursing-AAS, Elizabeth Vrettos - Nursing-AAS**
Title: ALTERNATIVE MEDICINE IN CONJUNCTION WITH PHARMACEUTICAL/WESTERN MEDICINE
Department: Health Sciences
Sponsor: Genell Stites

Abstract: The audience will need to have a basic understanding of how collaborating alternative medicine and pharmaceutical/western medicine can greatly improve patient outcomes. The goal is to show teamwork and collaboration of all mediums involved in patient care based on the patient's wishes. We will show how western medicine and homeopathic medicines used in combination will improve the patient outcomes. This presentation is also directed towards those who simply want a better understanding of how the different disciplines of practice can prove valuable in preventing/managing future health issues or improving current health statuses. This presentation hopes to show how the use of both western medicine and alternative medicine working together potentiate a better healthcare experience for the patient, with a focus on the alternative medical practices.

Presenter(s)-Major: **Corbin Cooper - Applied Mechanical Engineering, Michael Crespin - Mechanical Engineering, Connor Lumley - Mechanical Engineering, David Madrid - Mechanical Engineering, Rachel Wall - Mechanical Engineering**
Title: ELECTRIC MELTING FURNACE
Department: Physical & Environmental Sciences
Sponsor: Sarah Lanci

Abstract: In the engineering design process, it is important to keep in mind the manufacturability of a design. The purpose of this project was to create a portable electric furnace that the department could use to melt metals for casting parts, as part of an exploration in manufacturing processes. The furnace was made from a steel frame insulated with refractory brick and a heating element crafted from wound nichrome wire. An electric heating element was used to increase portability, ease of setup, and safety. The furnace design also included a temperature control circuit, crucible removal device, and a slag removal method. The designers' goal was to make a well-packaged product that could easily be set up for class demonstrations and laboratory experiments.

Presenter(s)-Major: **William Corey - Accounting-Public Accounting, Joshua Hardin - Accounting-Public Accounting, Sara Swaney - Accounting-Public Accounting**
Title: ETHICS OF NFL CONTRACTS AND THE PLAYERS ASSOCIATION
Department: Business
Sponsor: Suzanne Lay

Abstract: This research attempts to prove that some NFL players' contracts are not ethical with regards to the National Football League Players Association (NFLPA). Different contract structures from various players were analyzed using modern moral philosophies to see how those contracts met the requirements of the NFLPA and how those contracts correlated with modern ethics. Both the ethical obligations of the NFLPA and the ethical standing of each contract were analyzed. Additionally, the accounting structure of each contract was evaluated to see how meeting the requirements of the NFLPA might still result in an ethical dilemma. The research points to the fact that, even though all contracts met the accounting structure required by the NFLPA, some contracts may still not be considered ethical under modern moral philosophies. This research can be used moving forward to improve contract structure regulations by the NFLPA to promote more ethical values in the NFL.

Presenter(s)-Major: **Steven Corr - Geology**
Title: ANCESTRAL GUNNISON AND COLORADO RIVER TERRACES: AN ANALYSIS OF WHITEWATER TERRACES AND THEIR IMPLICATIONS FOR THE ORIGIN OF UNAWEEP CANYON
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

Abstract: Unaweep Canyon in western Colorado has been studied by many geologists since the late 1800's. Previous evidence suggests that the canyon was carved by a combination of both the Gunnison and Colorado Rivers. Currently, neither of these rivers flow through the 40 kilometer long Unaweep Canyon, so determining how it was formed is difficult. Past and current studies encompassing the surrounding ancestral river terraces of Unaweep help geologists to reveal part of the story behind how this canyon came to be. Red sandstone river gravels have been found in terraces near Gateway and Grand Junction, CO, and used to interpret a Colorado River origin. However, these same red sandstones have been found adjacent to the Gunnison River suggesting an alternative origin. The main purpose of this research project is to conduct detailed analyses of Gateway and Whitewater terraces, and determine if these red sandstones provide sufficient evidence for the ancient Colorado River in Unaweep Canyon.

Presenter(s)-Major: **Tiana Couse - Criminal Justice-POST Academy**
Title: A STUDY OF THE MOST EFFECTIVE MACERATION METHODS
Department: Social & Behavioral Sciences
Sponsor: Melissa Connor

Abstract: Maceration is the act of removing all soft tissue from the bones for further examination and must be done without damaging or morphing the bone. The techniques used to do this should be safe for the active party, fast, fairly inexpensive, and with equipment that any lay person could get. In order to determine the most effective method, six techniques were applied to feline skulls, bear paws, and human remains. These methods included boiling with two different degreasing agents (Dawn dish soap and Greased Lightning), power washing, beetle scavenging, microwave maceration, and physical maceration. This experiment is building off of Christine King and Wendy Birch's article "Assessment of Maceration Techniques Used to Remove Soft Tissue from Bone in Cut Mark Analysis" (2015). The new technique being tested is the power washing maceration and the use of human remains to test the other techniques. A sample size of five mountain lion skulls, two full bear paws, and one set of human remains were used. The sample was fairly small due to the limited availability of remains. Pictures were taken of every scenario of each technique and a system of effectiveness was applied based on the price, personal protection equipment (PPE) needed, the ease of the removal of soft tissue, the availability of equipment, the time needed for full maceration, the ease of the technique itself, and the amount of cleanup needed after the technique was used. The results showed no one technique as the most effective, but rather a mixture of the techniques that change on a case-by-case basis seemed to be the best option.

Presenter(s)-Major: **Danielle Cox - Art-Studio Art**
Title: DREAD SOVEREIGN
Department: Art
Sponsor: Steven Bradley, Joshua Butler

Abstract: "Dread Sovereign" is a hand-made stop-motion short, running app 4 minutes 30 seconds. My aim was to instill a sense of cerebral confusion for the viewer, specifically, the irrational anxiety of nightmares, as well as the subterranean truth found in the psychology of the dream world. Within this framework I imagined a strange story, one of slightly Germanic lore as well as an echo of German historical reference. The goal of the aesthetic was to create a splotchy, photorealistic, quality blending seamlessly with a strange illustrative style. By obscuring each individual frame by hand with acetone and a greasy black substance, I could achieve a very unique aesthetic for the whole project. The experience for the viewer is intentionally dizzying, both mentally and visually, provoking concentration and even psychological frustration. The short film took over a year to create and was a huge collaborative work. All participants were volunteers, who either supplied equipment or their talent. Four native German speakers total worked on the script, including Professor Gabriele Mayer-Hunke and Professor Steven Bradley of Colorado Mesa University. For the entire soundscape I had the pleasure of working closely with a fellow CMU alumni music graduate, Henry Daniels.

Presenter(s)-Major: **Jennifer Crimmins - Liberal Arts-Elementary Teaching**
Title: REFLECTIONS ON STUDENT GROWTH
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: A teacher candidate at Colorado Mesa University gathered and analyzed student growth within a fifth grade group of students throughout the spring 2015 semester. The purpose of this study was to gather data on specific objectives that were to be met throughout two different content units. Through a process of formative and summative assessments, interviews, and collaboration with other teachers, the candidate has been able to make educated reflections of the learning that was accomplished. The overall goal for this project was to analyze the learning that was accomplished by students throughout a unit, and what barriers may have stood in their way. This study is meant to be shared with other teachers and parents to determine specific obstacles related to students and their education. Through an analysis of this data, teachers can determine the best way to teach new information to students through the most productive instruction. The conclusion of this project will show that teachers need to continuously strive for a positive and effective impact on student learning.

Presenter(s)-Major: **Kristine Crippen - Biological Sciences-Biology, Keila Utu - Biological Sciences-Biology**
Title: DEVELOPING TECHNIQUES FOR QUANTIFYING PROXIMATE BODY COMPOSITION IN FISH USING BIOELECTRICAL IMPEDANCE ANALYSIS
Department: Biological Sciences
Sponsor: Eriek Hansen

Abstract: Methods for determining the condition of organisms are valuable tools for assessing the health of populations. Traditionally, length-weight relationships are used to quantify fish condition, but this method cannot differentiate among the components of proximate body composition (water, lipid, and lean masses). Current methods used to quantify proximate body

composition are lethal. Many fish species in the Colorado River are classified as imperiled and nonlethal techniques are needed to quantify proximate body composition. Bioelectrical impedance analysis (BIA) is a nonlethal method which measures resistance and reactance, and has been used to quantify human proximate body composition. Our goal is to develop BIA techniques for studying sensitive and endangered species. Our objectives are 1) refine BIA techniques for suckers and minnows, 2) compare effects of invasive needle electrodes versus noninvasive surface electrodes, 3) develop a multiple regression model for predicting proximate body composition of white suckers, 4) evaluate if the model is specific to white suckers or can be used for multiple species in the sucker family. We will report on the development of a BIA protocol and predictive model for white suckers and outline a study we will be completing this summer comparing needle versus surface electrodes in white suckers.

Presenter(s)-Major: **Gene Cross - Nursing-AAS, Chantel Heinrich - Nursing-AAS, James Randleas - Nursing-AAS, Claire Tregilgas - Nursing-AAS**
Title: TACTILE TEACHING TECHNIQUES FOR DIABETIC PATIENTS
Department: Health Sciences
Sponsor: Genell Stites

Abstract: As the waistlines of the US continue to grow, so does the number of cases of diabetes. As professional health care workers, we are always concerned about the safety of our patients. The greatest threat to patient safety is not when they are in our care, but when they go home. The ever present question is how to educate them in a way to understand this complex disease so that they will be able to make successful lifesaving changes. The presenters intend to explore the use of tactile teaching techniques specifically catered to educating diabetic patients.

Presenter(s)-Major: **Michael Cunningham - Master of Business Administration**
Title: EFFECTIVENESS OF AUTOMATION TOOLS ON COMMERCIAL GREENHOUSE OPERATIONS
Department: Business
Sponsor: Donald Carpenter

Abstract: This research project examines Orchard Mesa Greenhouse's need to find the most cost and labor effective ways of moving and irrigating bedding plants. The research issue and questions will explore the need and feasibility of the process changes. A literature review will examine published information regarding plant moving and irrigation automation to date. The research approach and methodology section explains that the questions will be addressed via literature review, data analysis, process modeling and simulation, statistical analysis, and logical deduction. A timeline is provided regarding all of the steps necessary to the performance of this practicum. Finally, as a result of the project, conclusions will be drawn, and recommendations presented to the client.

Presenter(s)-Major: **Shannon Cuoco - Nursing-AAS, Lois Garraty - Nursing-AAS, Amanda Rubalcave - Nursing-AAS, Bandie Smith - Nursing-AAS**
Title: ENSURING ADEQUATE HYDRATION THROUGH TEAMWORK AND COLLABORATION
Department: Health Sciences
Sponsor: Genell Stites

Abstract: Adequate hydration is important for overall good health, but it becomes a vital intervention in the care of patients who are already vulnerable and compromised in body function, as dehydration can not only impede recovery but lead to other serious health consequences and increased health care costs. Research indicates that the elderly, particularly those in residential long-term care facilities, are the population most under-hydrated and at greatest risk for complications of dehydration. Contributing factors may include: under staffing leading to lack of supervision of liquid intake, lack of beverages to suit resident preference, lack of easily accessible/utilized drinking receptacles, and biomechanical impediments such as dysphagia and aphasia. Teamwork and communication are essential in order to ensure that the simple measure of adequate hydration is being carried out, which will in turn help to ensure the best possible health outcomes for the elderly in residential care. This team of presenters will offer a comprehensive look at the challenges long-term care facilities face in delivering this most vital of care elements, as well as design a simple, yet effective hydration plan for long term care facilities that addresses not only residents' specific needs, but also the needs of the health care team who cares for them.

Presenter(s)-Major: **John Cusick - Business Administration-Marketing, Tyre Ephriam - Business Administration-Marketing, Jonathan Wallace - Sport Management, Corinne Williams - Business Administration**
Title: **KLASS**
Department: **Business**
Sponsor: **Tim Hatten**

Abstract: A start-up business with no marketing strategy has just come alive through the owner. However, with no marketing strategy to help, we have created something that can improve the value of the brand. Klass is a student-owned clothing business that needed a new way to market, rather than just successful word of mouth tactics. We looked at the demographics of the county that we currently live in and decided that the Klass brand can flourish in this area. We administered a survey of ten questions including: thoughts on our logo, what brands closely relate to us, and activities that closely relate to our brand. With the analyzed data through SPSS (analytic software) we will show the best place for the brand, which demographic is the best fit for us, as well as even the best place for our pop-up shop (either a traveling shop that can be anywhere, or a shop in a concrete location where we can begin selling items) to be. We may have begun without a marketing strategy, but with the research we have compiled we are well on our way to creating one. The importance of this project for all of us is very high because of the success that we are chasing. We will continue to market on campus and move into different geographical locations through various media channels in accordance to our new marketing strategy.

Presenter(s)-Major: **Caitlin Davis - Liberal Arts-Elementary Teaching**
Title: **STUDENT ASSESSMENT CASE STUDY (APPALS)**
Department: **Teacher Education**
Sponsor: **Cynthia Chovich**

Abstract: This project focuses on assessment and the data that is shaping instruction within the modern day classroom. Through an in-depth case study of a student, who is a little below grade level, the teacher candidate was allowed to put theories of assessment into practice and discover how students learn and how data is used to interpret their knowledge. In the assessment process, the goal was to determine how assessments should meet the needs of the students and provide information about where they are developmentally. By also considering the environmental factors of the student's life, the teacher candidate was also able to use that information to help assess the student and interpret the data. This process allowed the teacher candidate to figure out how to assess the student, as well as how to choose the following assessment. Overall, the teacher candidate learned how to assess and how assessments shape instruction within the classroom.

Presenter(s)-Major: **Noelle De Puey - Mathematics**
Title: **SEISMIC EXPLORATION**
Department: **Computer Science, Mathematics & Statistics**
Sponsor: **Daniel Schultz-Ela**

Abstract: Seismic refraction is a widely used tool to discover locations of oil and gas by using mathematics. By analyzing the refraction and reflection layers displayed in new generation computer models, scientists can now more accurately predict where these deposits are located. In using these data they can then determine the best and most accurate surface locations to set a drilling rig to discover and develop an oil or gas field. This along with other new technology is the reason both old and new fields are providing the energy we use today and powering our economy. This poster will provide a brief overview of the history and process of seismic exploration and then cover the mathematics used in seismic refraction and reflection.

Presenter(s)-Major: **Carli DeArmond - Nursing-BSN, Erica Nielson - Nursing-BSN, Weston Owens - Nursing-BSN, G Wagner - Nursing-BSN, Mackenzie Welfare - Nursing-BSN**
Title: **PREVALENCE OF POST-TRAUMATIC STRESS DISORDER AMONG FLIGHT NURSES COMPARED TO NURSES THAT WORK IN OTHER CRITICAL CARE SETTINGS**
Department: **Health Sciences**
Sponsor: **Bridget Marshall**

Abstract: Purpose: A research proposal to identify the prevalence of post-traumatic stress disorder (PTSD) among flight nurses compared with nurses practicing in other critical care settings. Problem Statement: Limited research exists on the prevalence of PTSD among civilian flight nurses. Information is available on nurses practicing in other critical care settings, including Intensive Care Units and Emergency Rooms. Research Question: What is the prevalence of PTSD among civilian flight nurses compared with nurses practicing in other critical care settings? Methodology: A mixed method study using the Posttraumatic Stress Diagnostic Scale (PDS) to survey both civilian flight nurses and critical care nurses will be used. The sample will consist of flight nurses from 11 hospital-based air medical programs across the state of Colorado as compared to nurses working in other critical care settings within the same hospitals. Twenty surveys to the flight crews at each of the 11 hospital-based air medical programs and 20 surveys

to the hospital's respective critical care units will be distributed. This will be a cross-sectional study surveying the prevalence of PTSD within two different populations of nurses at a specific time. Descriptive statistics will be employed to evaluate the results of the surveys.

Presenter(s)-Major: **Adam Degemann - General Engineering, Paul Jensen - Computer Science, Ryan Kawano - Applied Mechanical Engineering, Taylor Rucker - Applied Mechanical Engineering**
Title: SELF-ERASING WHITEBOARD
Department: Business
Sponsor: Georgann Jouflas

Abstract: A group of students have researched, designed and manufactured a prototype to fix a problem in classrooms. In nearly every class, the instructor's valuable time is wasted erasing whiteboards. Through interviews and extensive research, the group found that the task of erasing whiteboards is not only a waste of time but a waste of money as well. Cleaning supplies and janitorial staff salaries are spent on cleaning hundreds of whiteboards daily at Colorado Mesa University. The students attempted to construct a self erasing whiteboard prototype, using existing technology. The goal of the self erasing whiteboard is to ensure that the end user is not spending their time on erasing their work and that the purchaser is allocating far less of their budget to whiteboard maintenance.

Presenter(s)-Major: **Keegan DePriest - Geosciences-Geology**
Title: SEISMIC INTERPRETATION OF THE MISSISSIPPI INTERIOR SALT BASIN
Department: Physical & Environmental Sciences
Sponsor: Verner Johnson

Abstract: This project will investigate possible oil and gas reservoirs in Mississippi Interior Salt Basin in central Mississippi by interpreting seismic data collected from oil and gas companies operating in the region. The Mississippi Interior Salt Basin lies from Texas to Alabama. The area is known to be a foreland basin located between the Appalachian and Ouachita Fold and Thrust Belts. The Mississippi Interior Salt Basin covers an area of twenty three thousand square miles. It is bounded by the Cincinnati Arch, Appalachian Basin, Louisiana-Mississippi Salt Basin and Mississippi Embayment. The main framework for the basin is Paleozoic block faulted strata dipping southwesterly away from the Nashville Dome in the Cincinnati Arch Province. The Appalachian and Ouachita orogenic belts cut the frontal thrust faults in a southeasterly and southwesterly pattern. These are buried beneath Cretaceous and Tertiary strata of the Mississippi Embayment and Gulf Coastal Plain. The objective is to interpret the strata to discover structures that are associated with oil and gas reservoirs and use ArcGIS to construct a contour map of the top layer to locate possible drill locations.

Presenter(s)-Major: **Mitchell Dille - Mechanical Engineering, Douglas Hansen - Mechanical Engineering Tech, Dominique Pitts - Mechanical Engineering, William Somerville - Mechanical Engineering**
Title: RAIL GUN
Department: Physical & Environmental Sciences
Sponsor: Jody Kliska

Abstract: Rail guns are a relatively new technology currently being designed for use in military and aerospace applications. A rail gun uses enormous amounts of energy to electronically charge an object which in turn accelerates the object to as high as Mach 8. Using a rail gun as a weapon is difficult due to the large quantity of energy required to charge the object being fired. The team will explore different ways in which energy can be generated to power a rail gun. The team will then demonstrate the rail gun in hopes of continuing the development of this new technology.

Presenter(s)-Major: **Ryan Dobson - Geosciences-Geology**
Title: INTERPRETATION OF A JURASSIC RIVER SYSTEM WITHIN THE DINOSAUR-BONE BEARING BRUSHY BASIN MEMBER OF THE MORRISON FORMATION, RABBIT VALLEY, WESTERN COLORADO
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

Abstract: The Upper Jurassic Morrison Formation has been of interest to geologists and paleontologists due to the tremendous number of dinosaur bones preserved within the formation. Why the ancient rivers and floodplains, represented by this formation, contain so many dinosaur bones is still in question. The Morrison Formation accumulated in a broad, short lived and slowly subsiding basin that extended across much of the western U.S. and up into Canada. The purpose of this project is to analyze the alluvial architecture, and interpret the characteristics of a single river system of the Brushy Basin Member of the Morrison

Formation in Rabbit Valley. Measuring stratigraphic sections and describing the alluvial architecture and sedimentary structures of this sandstone will provide a better understanding of why this particular river system accumulated so many dinosaur bones.

Presenter(s)-Major: **Logan Donohue - Mechanical Engineering, Gregory Gonzales - Mechanical Engineering, Dominick Heskett - Mechanical Engineering, Benjamin Tarasiewicz - Mechanical Engineering, Levi Walcher - Mechanical Engineering**

Title: MAGNETIC MOTOR

Department: Physical & Environmental Sciences

Sponsor: Sarah Lanci

Abstract: It is estimated that it takes 714 pounds of burned coal to power a 100-Watt light bulb continuously for one year. The purpose of this project was to create a resource-efficient motor without the need for natural resources such as coal. This project focused on a motor powered by magnets placed at specific points on a wheel. A rotation was created by bringing an oppositely facing magnet in the range of the magnets on the wheel. The repulsion of the opposite poles created kinetic energy from the stored potential energy in the magnets which was harnessed and turned into electricity through use of a generator. The resulting electricity was then used to power a light bulb thus proving the possibilities of electricity generation from magnetic repulsion. Electric power created from magnetic repulsion has great potential in the energy fields because it reduces the amount of natural resources needed to create the energy and sets up a system for sustainable renewable energy.

Presenter(s)-Major: **Stephen Drozda - Mechanical Engineering, Peter Greco - Mechanical Engineering, Manuel Prieto - Mechanical Engineering, Connor Timms - Mechanical Engineering, Christopher West - Mechanical Engineering**

Title: THE JUGGERNUT; STRESS DEMONSTRATION

Department: Physical & Environmental Sciences

Sponsor: Sarah Lanci

Abstract: When hanging from a rock hundreds of feet from the ground it seems like a small piece of metal may not hold a fall. However, climbing protection, be it passive or active, can hold a tremendous amount of force. Passive protection involves static loading of a wedged piece of gear in the rock. Active protection is when the piece of gear involves a camming action to exert outward forces on the rock. The purpose of the Juggernaut is to combine active and passive protection into one piece of equipment. This new piece of climbing gear does not scar the rock and holds the same forces as commercial gear. The stress on the rock is shown through photoelastic stress testing. Viewing a material with birefringent properties through a polarized lens will show stress lines. Using the climbing gear in a mock-up crack made of birefringent material shows the stress lines, and indicates the quantity and location of stress on the crack. The different types of climbing protection can then be compared by viewing the stress lines produced in the mock crack.

Presenter(s)-Major: **Allison Duncan - Theatre Arts-Dance**

Title: BAGGAGE

Department: Theatre Arts

Sponsor: Megan Glynn

Abstract: The year 2014 has been dubbed by some anthropologists as "The Year of the Crazy Ex-Girlfriend" in popular culture. Music, television and social media have poked fun at this humorous stereotype while also exploring the power of desire and commitment that drives "twenty-somethings" to cling to their relationships long after they are over. In addition to the vast attention to this topic from various social media sources, the presenter became interested in this subject after hearing stories from peers dealing with their crazy ex-significant others and began to study the psychology behind this peculiar behavior. This presentation will examine the stereotype of the "Crazy Ex-Girlfriend" and demonstrate psychological thoughts and behaviors specific to this type through dance. It will also explore how social media's influence in today's society allows people to hold on to terminated relationships in the privacy of their own homes. In addition to psychological research of emotions and physical traits associated with this stereotype, the presenter will interview peers dealing with a "crazy ex" and present the findings of specific stories through dance and text.

Presenter(s)-Major: **Briana DuRocher - Liberal Arts-Elementary Teaching**
Title: STUDENT GROWTH
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: The purpose of this project is to help future teachers have a better understanding of the importance of assessments and the knowledge that can be gained from them. To meet the goal of this project student work needs to be collected and evaluated. The presenter is studying to be an elementary school teacher so the data will be taken from a second grade classroom. The research is expected to show the growth between a pre-assessment and a post-assessment in the following content areas: reading, math, science, and writing. The conclusion of this project will show the importance of evaluating growth in students academic performance in these content areas. It will show future teachers why assessments are a necessity in the classroom to understand where students are before and after they have been instructed on the topic.

Presenter(s)-Major: **Tara Ebarb - Master of Business Administration**
Title: PROCUREMENT AT SAN JUAN CONSTRUCTION
Department: Business
Sponsor: Donald Carpenter

Abstract: This purpose of this project is to solve a business process problem for San Juan Construction (SJC), a general contractor based in Montrose, Colorado. The process problem the company is facing involves its procurement process. As the company has grown from a small business to a large business, the current process has been unable to handle the increased resources and personnel, causing problems mainly at the beginning and end of the process. The research questions address the overall issue of improving the efficiency of SJC's procurement process. Literature was explored to find the best practices of procurement, and an Arena simulation model was created and validated to model SJC's current process. Statistical analysis was then run on the original model, as well as on the model after changes were made. Logical deductions based on these analyses and the resulting recommendations for the client on how to improve its procurement process will be presented.

Presenter(s)-Major: **Rachel Eckelkamp - Theatre Arts-Acting/Directing, Elisa Glavin - Theatre Arts-Acting/Directing**
Title: "ELEEMOSYNARY" BY LEE BLESSING
Department: Theatre Arts
Sponsor: Maurice LaMee

Abstract: The second scene is from "Eleemosynary" by Lee Blessing featuring Rachel Eckelkamp as Artie and Elisa Glavin as Echo. In this scene Dorthea has just died and they are working on sorting out all of her possessions before the funeral. While they're sorting through everything Artie tells Echo that she wants Echo to go and live with her Uncle Bill's family. Artie says that she was never a good mother to Echo and that's why she keeps leaving her with other family members. Echo leaves with Uncle Bill and his family after Dorthea's funeral. Two weeks later, Echo runs away from Uncle Bill's and back to her grandmothers house because Uncle Bill hardly even remembers Artie or Dorthea. She says that she's going to acclimate her mother so that they can live together. Finally Artie agrees. This pushes both characters to an emotional point, making both realize that that need each other. This will show the audience how families will change and then try to adapt.

Presenter(s)-Major: **Sarah Elliott - Nursing-BSN, Flor Galvan - Nursing-BSN, Mallory Haulman - Nursing-BSN, Rebecca Luckett - Nursing-BSN**
Title: COMPLEMENTARY AND ALTERNATIVE THERAPIES IN NURSING
Department: Health Sciences
Sponsor: Beverly Lyne

Abstract: Despite patient demand and nurse acknowledgment of need, both have yet to be met due to the gap in nurse education about CAM therapies. Research outlines the gap between nurse education and patient interest in CAM therapies. The objectives of this study are to determine which CAM modalities nurses are most interested in learning about, and which methods of obtaining the necessary training would prove the most beneficial to the nurses. Nurses surveyed are licensed practical nurses (LPNs) or registered nurses (RNs) with a bachelor's or associate degree. Facilities to be used include St. Mary's Hospital, Community Hospital, VA Hospital, Marillac Clinic, the Health Department, all home health agencies, and all long term care facilities. An email will be sent out to nursing administrators at each facility and will then be forwarded to each nurse. Surveys are completed in the preferred setting of the nurses. Data will be compiled through a designated email address and all survey codes will be stored in a password protected web-based program.

Presenter(s)-Major: **Allison Ellis - Liberal Arts-Elementary Teaching**
Title: ASSESSMENT PROCESS, PRACTICE AND ANALYSIS LEARNING STUDY
Department: Teacher Education
Sponsor: Cynthia Chovich

Abstract: APPALS (Assessment, Process, Practice, and Analysis Learning Study) is a case study conducted by a teacher candidate on one elementary student over the course of a semester. The case study consists of assessments to establish baselines in reading and writing instruction, in-depth data analysis, research to support instructional decisions, and selection of future assessment instruments. The case study is designed to assist the teacher candidate in developing, practicing, analyzing, and using theories and methods necessary in today's literacy classroom.

Presenter(s)-Major: **Karen Enenkel - Nursing-BSN, Alicia Fender - Nursing-BSN, Merrill Hunt - Nursing-BSN, Davis Petrash - Nursing-BSN, Crystal Tucker - Nursing-BSN**
Title: RAPID HUMAN IMMUNODEFICIENCY VIRUS TESTING ON COLLEGE CAMPUS TO IMPROVE TESTING PARTICIPATION
Department: Health Sciences
Sponsor: Bridget Marshall

Abstract: A research proposal was developed to determine the most effective approach for increasing first time participation in rapid human immunodeficiency virus testing (RHIVT) of Colorado Mesa University (CMU) students. A recent study looked at RHIVT, comparing RHIVT at a private university with a community college utilizing a student run weekly clinic on each campus. This study did not consider whether students would be more likely to undergo testing if administered by students versus at an on campus, student health services clinic. One question is: Does a student-run RHIVT initiative at the CMU University Center attract more first time HIV testing participants than RHIVT at the CMU Student Health Center? Methodology: The study will be a mixed method design with a cross-sectional arm looking at the population of first ever HIV testing participants along with a descriptive arm to analyze demographic characteristics. The sample will include students who undergo RHIVT in September 2015 at either the CMU Student Health Center or the weekly student run clinic. The tools used will include a quantitative survey and chi squared tests of association.

Presenter(s)-Major: **Abigail Engel - General Engineering, Jeremy Gilliam - Applied Mechanical Engineering, Antonio Gueretta - General Engineering, Aldrin Micua - General Engineering, Seamus O'Brien - General Engineering**
Title: BIOMASS GASIFIER
Department: Physical & Environmental Sciences
Sponsor: Sarah Lanci

Abstract: Fossil fuel is a widely used form of energy to run internal combustion engines; however, its supply is not infinite and is slowly dwindling. The purpose of this project was to design a biomass gasifier that is able to power a small engine using unburnt gas emission as a source of alternative energy. A biomass gasifier would exemplify a possible alternative source of energy that is renewable, self-sustaining, and off the grid. In this project, the fumes from the burned biomass were used as the sole energy source for a small combustion engine with the hope to raise community awareness to the possibility of using a biomass gasifier to power other devices that currently utilize fossil fuel.

Presenter(s)-Major: **Madison Everett - Liberal Arts-Elementary Teaching**
Title: WHAT U.S. EDUCATION IS MISSING: MINDSET AS THE CORNERSTONE TO FINNISH SUCCESS
Department: Teacher Education
Sponsor: Mark Schmalz

Abstract: This research explores the characteristics of the Finnish education system that contribute to the country's renowned success in Program for International Student Assessment (PISA) scoring. Motivating the research was the curiosity to uncover what the United States education system is missing, and what changes could be made to parallel the success of Finland. Through observations in the University of Eastern Finland Teacher Training School in Joensuu, the researcher discovered three main domains where the uniqueness of Finnish culture enriched the educational experience. These fields of interest were environment, interactions, and the teacher training program. Although these areas were only subtly different from the US, it was clear that the mindset behind education in Finland is what makes their success stand out in worldwide comparisons, and more importantly a true focus on genuine learning. After observing and experiencing these differences, it is clear that the United States education system must change the mindset behind the profession, not only policy and legislation. This presentation is for educators, legislators, and parents to help give insight into the cultural problems that affect our US schools by using a comprehensive comparison to Finnish school life.

Presenter(s)-Major: **James Feyerherm - Technology Integration-Network Technician, Thom Kerns - Technology Integration-Network Technician, Adam Perry - Computer Information Systems**
Title: WCCC 3D PRINTER NETWORK
Department: Western Colorado Community College
Sponsor: John Sluder

Abstract: This project is the design of a campus-wide network for use by students and professors to build prototypes on WCCC/CMU campus 3D Printers. This network system will enable students to send .stl files of their designs to professors for approval. Professors can review the submitted .stl files for accuracy and send the files to any of the 3D Printers on WCCC/CMU campus. Professors will also have the capability to remotely monitor and manage print jobs for all 3D printers. The set-up of any required software IP addresses and permissions will be coordinated with the CMU IT Department.

Presenter(s)-Major: **Ross Fischer - Mechanical Engineering, Keenan Jewkes - Mechanical Engineering**
Title: AN ARTIFICIAL NEURAL NETWORK APPROACH TO THE EFFECTS OF BUILD PARAMETERS ON MECHANICAL PROPERTIES OF FDM-MANUFACTURED PARTS
Department: Physical & Environmental Sciences
Sponsor: Scott Kessler

Abstract: The goal of this project was to develop a server database of ABS material FDM manufactured parts mechanical properties. The database will be linked to a trained artificial neural network allowing users to obtain mechanical properties based on their specified printing parameters. The mechanical properties are based on printing temperature, build orientation, layer thickness, and raster angle. The artificial neural network's design will allow for predicting tensile/compressive strength, yield strength, and modulus, as well as IZOD impact strength based on the above printing parameters. The project's objectives are to compare mechanical property predictions of databases with experimental data and to develop a server database tied to the neural network and publish it on an open source website. Additional testing and neural network design performed on all popular FDM materials would make the server database more robust.

Presenter(s)-Major: **Danielle Flores - Nursing-BSN, Allison Freund - Nursing-BSN, Madelyn Hogarth - Nursing-BSN**
Title: HOME HEALTH CANCER TREATMENT: EFFECTS ON ADOLESCENT IDENTITY DEVELOPMENT -- A QUALITATIVE APPROACH
Department: Health Sciences
Sponsor: Stacie Schreiner

Abstract: Extensive research exists concerning effects of cancer treatment on the pediatric population; however, there is limited research specific to the adolescent population. The purpose of this study is to explore how home health nursing care affects adolescent identity development during maintenance therapy for cancer. The sample consisted of 20 adolescents between the ages of 12 and 19 who are in the maintenance phase of cancer treatment. Semi-structured interviews will allow researchers to explore variables that influence identity development and themes will be extrapolated from the interview content. This study is expected to reveal positive and/or negative effects of using home health treatment in adolescent cancer patients.

Presenter(s)-Major: **Shannon Foley - Theatre Arts-Music Theatre**
Title: GET YOUR @#%\$ TOGETHER! AND OTHER WISE WORDS WITH SHANNON FOLEY
Department: Theatre Arts
Sponsor: Jeremy Franklin

Abstract: "Get Your @#%\$ Together! And Other Wise Words with Shannon Foley" is a full-length cabaret written and performed by Shannon Foley with piano accompaniment by Douglas Morrow. The presenter will perform the contemporary musical theatre song "Avalanche" by Kait Kerrigan and Brian Lowdermilk. The cabaret is essentially a "Ted Talk" seminar that goes awry. This section of the cabaret focuses on a switch in the mentality of the presenter from being overly cautious and guarded to completely flipping her switch and letting the insanity of love, adventure, and life in general fall where it may.

Presenter(s)-Major: **Jessica Forbes - Nursing-BSN, Christie Harju - Nursing-BSN, Emma Kerr - Nursing-BSN, Jordan Talley - Nursing-BSN**
Title: INVESTIGATION OF REGISTERED NURSES' ATTITUDES TOWARDS SUICIDE ATTEMPTERS
Department: Health Sciences
Sponsor: Bridget Marshall

Abstract: Purpose: A research proposal to investigate registered nurses' attitudes towards caring for individuals who have unsuccessfully attempted to end their life, referred to in this study as suicide attempters. Research question: What are the attitudes of registered nurses working on inpatient floors at St. Mary's Hospital and Regional Medical Center and Community Hospital in Grand Junction, Colorado concerning caring for suicide attempters? Problem: Suicide is a prominent concern in Colorado and Mesa County has one of the highest rates of completed suicide in the state. Studies regarding nurses' attitudes towards suicide attempters have been completed in several countries. Limited information is available concerning nurses' attitudes towards caring for suicide attempters in the United States. The present study sample will provide insight on registered nurses' attitudes currently working on medical, surgical, neurological, orthopedic, pediatrics, and intensive care units at St. Mary's Hospital and Regional Medical Center and medical, surgical, and intensive care units at Community Hospital in Grand Junction, Colorado. Methodology: Sample selection will take place from August 2015 to December 2015. A descriptive observational study design will be used to solicit nurses' attitudes. Descriptive statistics will be used to compare means and look for relationships.

Presenter(s)-Major: **John Fowler - Computer Science, Zack LaVergne - Computer Science, Tarrell Rodrigues - Computer Science**
Title: SUPERIOR NOTE
Department: Computer Science, Mathematics & Statistics
Sponsor: Lori Payne

Abstract: As digital tools become more prevalent in classrooms, the need for unique note taking applications increases. Many existing note taking programs are complex and hard to learn. While there are simple tools that are easier to learn, they were not meant for professional use. This project will create a note taking application that is professional, simple and easy to learn.

Presenter(s)-Major: **Mykenzie Fox - Liberal Arts-Elementary Teaching**
Title: STUDENT GROWTH WITHIN AN ELEMENTARY CLASSROOM
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: This project was developed as a final for a teaching internship. Data was collected from two units in a second grade classroom. The first unit covered adding and subtracting, and the second covered informative writing. A variety of assessments were given to track the students' growth along the way. The goal behind this project was for teachers to analyze the progression of each of the students' learning and determine what worked and what did not, in terms of teaching practices. Graphs will show the disaggregated data of the independent learners' growth and compare that data to the growth of the students who are given extra assistance (accommodations/differentiations). The concluding piece will be the knowledge gained from each assessment as well as student growth throughout the units.

Presenter(s)-Major: **Sean Gangle - Computer Science, Amanda O'Connor - Mathematics**
Title: ELEMENTARY STUDENT MATH AID
Department: Computer Science, Mathematics & Statistics
Sponsor: Lori Payne

Abstract: The student developers will create a mathematics learning aid, targeted at elementary school-aged students. Utilizing the Visual Basic programming language, student developers will implement an interactive desktop interaction, with grade appropriate mathematics challenges. Depending on grade level, students interacting with the application will be able to experience common math operations: addition, subtraction, multiplication, and division. The application will provide feedback to user attempts, celebrating successes and providing guidance for challenges with which students struggle.

Presenter(s)-Major: **Rayne Gardner - Mathematics-Statistics, Michael Sweeney - Computer Science**
Title: SOFTWARE FOR THE EVER-CHANGING SERVICE INDUSTRY
Department: Computer Science, Mathematics & Statistics
Sponsor: Lori Payne

Abstract: Service-based businesses and small businesses with employees in the field are always on the move. With multiple projects and job sites all over town, managers are faced with the daunting task of tracking their employees and physical assets in an ever-changing environment, as well as managing the timely completion of jobs for their clients. This presentation will demonstrate a software tool that allows managers to better manage the places, people and things that keep their business running. By utilizing a simple, intuitive and highly visual user interface, the presentation will show how small business owners and managers can use this software to keep their business and their income flowing.

Presenter(s)-Major: **Zachary Gardner - Biological Sciences-Biology, Kathryn Hawley - Biological Sciences-Biology, Adriana Ramos-Gonzalez - Chemistry**
Title: DYNAMIN-RELATED PROTEIN 1 AS A REGULATORY PROTEIN OF MITOCHONDRIAL MORPHOLOGY AND APOPTOSIS IN BREAST CANCER MODELS
Department: Biological Sciences
Sponsor: Kelly Jean Craig

Abstract: While breast cancer is the second most prevalent form of cancer, its tumorigenesis (conversion from a healthy to cancerous cell) remains poorly classified. This study was undertaken because mitochondrial dynamics (processes of fusion and fission) have been linked to cell survival and the intrinsic apoptotic pathway, respectively. A hallmark indicator of cancer cells is the ability to evade apoptosis, a characteristic that has previously been associated with mitochondrial fusion in other cancer cell lines. It was expected that the cancerous cell lines in this study would exhibit a pro-fusion phenotype, indicative of a cell evading intrinsic apoptosis. Mitochondrial phenotypes of cell lines HTB-22 (adenocarcinoma), HTB-126 (invasive ductal carcinoma), and HTB-125 (epithelial tissue) were observed via confocal microscopy. Although no statistical difference was observed between HTB-126 and HTB-125 cells, the HTB-22 cells displayed a shorter, pro-fission phenotype when compared to HTB-125, contradictory to the hypothesis. The HTB-22 cells were further investigated in comparison the healthy HTB-125 cells, comparing apoptosis initial protein, dynamin-related protein 1 (Drp1), colocalization with the mitochondria. Protein dysregulation in cancer cells can be observed in preliminary results suggesting less colocalization of Drp1 at the mitochondrial membrane in HTB-22 when compared to HTB-125, despite the pro-fission phenotype of HTB-22.

Presenter(s)-Major: **Robert Gasnick - Geosciences-Geology**
Title: OHIO CREEK CONGLOMERATE AT SHALE RIDGE, NORTHERN PICEANCE CREEK BASIN, COLORADO
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

Abstract: Since the late 1800's geologists have studied the Ohio Creek Conglomerate of the Piceance Basin, Colorado. Even with a continued interest with respect to oil and gas exploration, the unit has been poorly documented in the Shale Ridge area located 11 miles west of De Beque Canyon. The Ohio Creek Conglomerate overlies the Cretaceous Williams Fork Formation of the Mesaverde Group and rests below a major regional unconformity in the Piceance Creek Basin. Biostratigraphic studies of the Ohio Creek Conglomerate and surrounding units have provided ages for the conglomerate. However, the variable nature and poorly understood stratigraphic boundaries of the unit have created great difficulties in creating an accurate age estimate. Following previous work, this research project will define the Ohio Creek Conglomerate at Shale Ridge. Stratigraphic sections, lithological descriptions, and correlation of key boundaries will greatly aid in interpreting this unit. With the increasing demands on hydrocarbons, the Ohio Creek Conglomerate remains an important unit with regards to hydrocarbon reservoir exploration and source distribution.

Presenter(s)-Major: **Brianne Ghosh - Exercise Science**
Title: EFFECT OF GRIP WIDTH ON MUSCLE ACTIVATION IN TWO UPPER LIMB MUSCLES DURING BENCH PRESS EXERCISE
Department: Kinesiology
Sponsor: Brent Alumbaugh

Abstract: Bench press exercise has been utilized to increase athletic performance and upper body strength for decades. Various techniques for developing certain muscles have been studied, such as hand positioning, forearm positioning, and bench angle. Purpose: Compare muscle activation for the sternal head of the pectoralis major and lateral head of the triceps brachii at three different grip widths during bench press exercise using electromyography (EMG). Methods: Three collegiate football players performed three sets of eight repetitions, each set representing different grip widths (narrow = .44m; middle = .60m;

wide = .92m). 60% one-repetition maximum and bar speed was constant using a metronome of 66 beats per minute. Surface EMG activity of two muscles were collected and averaged at each width. Averages were compared for each muscle. MVC tests were performed on each muscle prior to data collection. Values were averaged and %MVC was calculated in order to compare subject results. Results: Muscle activation for pectoralis major sternal head and triceps brachii lateral head increased as grip width decreased. Muscle activation during bench press was 100-200% greater than muscle activation during MVC testing for each muscle. Conclusion: At a particular load, muscle activation was greatest at a narrower grip for both muscles.

Presenter(s)-Major: **Elisa Glavin - Theatre Arts-Acting/Directing, Demitri Miller - Theatre Arts-Acting/Directing, James Overcash - Theatre Arts-Acting/Directing**
Title: "REBORNING"
Department: Theatre Arts
Sponsor: Maurice LaMee

Abstract: Performers Demitri Miller, Jamie Overcash, and Elisa Glavin will be presenting a three person acting scene from the play "Reborn" by Zayd Dohron in a contemporary dramatic style. "Reborn" was written by Dohron in 2011 and was nominated for a Bay Theatre Critics Circle Award for Best Original Script. By choosing this newer contemporary piece the performers hope to engage their audience with deep modern-day questions such as the on-going question of what is art, where the moral boundaries of art lie, and the emotional state art may put a viewer or the artist themselves in. This scene illustrates rapid character shifts, emotional change and goal-orientated motivation that can be defined as true human moments, allowing performers to express full acting potential.

Presenter(s)-Major: **Lindsay Gnesios - Mechanical Engineering, Dylan McGraw - Applied Mechanical Engineering, Austin Rankin - Mechanical Engineering, Dirk Smuin - Applied Mechanical Engineering**
Title: POWER GENERATOR
Department: Physical & Environmental Sciences
Sponsor: Sarah Lanci

Abstract: Alternative energy has been shown to be very effective and extremely important in many places. The purpose of this project was to create a generator that could produce as much energy as a 12 volt system and also provide insight into how mechanical power is harnessed to produce electricity. The design team focused on using wind as the main power source for the generator, but also explored other possibilities for calm weather, such as pedaling a bicycle. The generator was designed to be an educational tool showing how kinetic energy is transformed into electrical energy, therefore all the parts of the generator were made as clearly visible as possible. This project was an example of a setup that could be built and used to cleanly support an "off the grid" lifestyle.

Presenter(s)-Major: **Kayla Gonzalez - Athletic Training**
Title: CHANGES IN BLOOD OXYGEN SATURATION LEVELS DURING MILD HYPERBARIC CHAMBER TREATMENT
Department: Kinesiology
Sponsor: Jeremy Hawkins

Abstract: Recent discussions in the process of wound healing have stated that implementation of hyperbaric oxygen therapy (HBOT) will increase the rate of tissue healing. The purpose of this study was to observe a patient's percent oxygen saturation during HBOT treatment, while we altered the atmospheric pressure as well as the supplemental oxygen. In previous studies, there has been no use or mention of oxygen saturation levels to back up the theory that HBOT increases oxygen saturation levels. In this study, subjects were placed in a hyperbaric chamber for 63 minutes and were then administered a series of different combinations of atmospheric pressure and oxygen supplementation. During the HBOT treatment, subjects wore a pulse oximeter and their oxygen saturation levels were documented every minute. The results of this study showed that HBOT that included oxygen supplementation and increased atmospheric pressure, along with treatment that contained oxygen supplementation alone led to the highest oxygen saturation readings. A larger subject pool should be considered for future studies, but when choosing treatment parameters for HBOT this information can be used as a baseline to obtain desired oxygen saturation levels.

Presenter(s)-Major: **Brandon Gracey - Physics**
Title: ANALYSIS OF THE INTERACTION OF SGR A* AND THE SMALL GAS CLOUD G2 IN THE GALACTIC CENTER
Department: Physical & Environmental Sciences
Sponsor: Jared Workman

Abstract: In 2011 a group of researchers observed a gaseous cloud (later named G2) approaching the supermassive black hole at the center of our galaxy, Sagittarius A*. G2, was on a highly eccentric orbit around with the supermassive black hole Sgr A* which could potentially result in a small accretion event that would be observable from the Earth. Over 100,000 computing hours were used for simulations. Analysis routines were developed to compare simulation results to predictions based on observations.

Presenter(s)-Major: **Micah Green - English-Literature, Kirk O'Connell - Hospitality Management, Maleah Schad - Exercise Science**
Title: MOUNTAIN HIGH WATER RESORT
Department: Business
Sponsor: Britt Mathwich

Abstract: In order to gain a realistic and in depth understanding of how the resort development and marketing process works, a group of three students in the Hospitality Management class (HMG 450) came together to create a preliminary concept development. It was important that the group completed all of the six vital segments of producing a resort of their choice, including a marketing plan, but steps one through three will be discussed today. The first phase that will be presented is the basics, such as the resort concept, who the concept will target, and the competitive analysis. The second part will go through an in-depth description of what kind of amenities the resort will offer. The last phase to be discussed will demonstrate the layout of the resort. It will go over the space design, the resort layout, ADA concerns, and how the resort is being made as environmentally friendly as possible. This information will represent the Mountain High Water Resort and Conference Center in Crested Butte, Colorado. It will give guests a chance to affordably escape to the beach. The overall objective of this project is to fully understand the process of developing and marketing a successful resort.

Presenter(s)-Major: **Lenaya Hafley - Medical Laboratory Technician, Anchalee Smith - Medical Laboratory Technician**
Title: B POSITIVE
Department: Health Sciences
Sponsor: Tracy Matthews

Abstract: More than 41,000 blood donations are needed every day, with someone in the U.S. needing a transfusion every 2 seconds. With that many donations needed, only 38% of the U.S. population is eligible to donate but only 10% actually do. The 10% that donate in the U.S. is considered a high number compared to developing countries. In 2014, of the 108 million blood donations collected globally, approximately half of these are collected in the high-income countries, home to 18% of the world's population. Some foreign countries have trouble maintaining a safe supply of blood due to the lack of technology and skilled laboratory workers to properly test, process and store red blood cells for transfusions. Mass producing artificial Type O negative blood, the universal red blood cell donor, cultured from bone marrow, would make up for the shortage of blood needed worldwide. Artificially culturing red blood cells could provide a safe alternative for blood transfusions by eliminating the transmission of blood borne pathogens.

Presenter(s)-Major: **Stacey Hale - Nursing-BSN, Ashley Jereb - Nursing-BSN, Taylor Purrington - Nursing-BSN, Lauren Quick - Nursing-BSN, Jessica Stratton - Nursing-BSN**
Title: SCREENING TOOLS TO IDENTIFY PREVALENCE AND INCIDENCE OF MARIJUANA USE IN PREGNANCY
Department: Health Sciences
Sponsor: Bridget Marshall

Abstract: A research proposal to explore the incidence of marijuana use in pregnant women in Colorado and identify if providers are screening for prenatal marijuana use. Problem Statement: Since the legalization of marijuana in Colorado in 2014, there is an increased concern about use amongst pregnant women. Very little is known about how marijuana affects the growth and development of the fetus. Screening tools are available for practitioners to utilize; whether or not they are being used is unclear. Research Question: What is the prevalence and incidence of marijuana use in pregnant women in Colorado and are providers screening for prenatal marijuana use? Methodology: A quantitative questionnaire will be sent to all gynecologists, obstetricians, midwives and primary care providers in the Grand Valley to evaluate the use of marijuana screening tools for pregnant mothers. The study will be conducted over a one-year timeframe. We will use descriptive statistics to evaluate the information.

Presenter(s)-Major: **Terence Haley - Mechanical Engineering, Timothy Kettle - Mechanical Engineering, Marcus Matthews - Applied Mechanical Engineering, Scott Taylor - Mechanical Engineering**
Title: DOUBLE ELECTROSPINNING SYSTEM
Department: Mechanical Engineering Partnership Program, Colorado Mesa University and University of Colorado Boulder
Sponsor: Francisco Castro

Abstract: Electrospinning is a technique used to create polymer nanofibers intended for use as scaffolding for tissue engineering. The goal of this project was to design, construct, and program an automated double electrospinning device that will be capable of producing nanofibers of two distinct materials simultaneously and layering them together. The nanofibers produced by the device will be used for experiments with cellular regeneration and other biomedical applications. Major components of the double electrospinner include two injection pumps, a motorized linear slider, two high-voltage power supplies, and a motorized rotating collector. The injection pumps are used to pump polymer solutions through syringes. The syringe tips have a high voltage applied to them, which causes the polymer solution to shoot to the grounded collector, thereby producing nanofibers. The syringe tips are conveyed back-and-forth along the length of the rotating collector with the motorized linear slider, allowing longer specimens to be produced. By automating the system, precision and control of the electrospinning process can be enhanced and the ability for data logging and system error warning can be added.

Presenter(s)-Major: **Jacob Hall - Computer Science, Ernest Ripley - Computer Science, Rico Trask - Computer Science**
Title: MAVCLOUD
Department: Computer Science, Mathematics & Statistics
Sponsor: Lori Payne

Abstract: Students at Colorado Mesa University find the current file system for remotely uploading homework assignments for classes to be a confusing and unreliable hassle. Even for experienced users, the current system has several flaws that make uploading and grading to be inconsistent between different teachers and classes. This presentation will demonstrate a desktop-based application for remote modification of files and folders on the student network and include a simple, attractive graphical user interface that streamlines file management and provides an overview for class semester information.

Presenter(s)-Major: **Laurie Hamon - Business Administration, Parker Sowash - Business Administration-Management**
Title: BRAND SYMBOL RECOGNITION
Department: Business
Sponsor: Deborah Parman

Abstract: This project examined the different outlooks on popular logos and brand symbols. The results of 60 surveys were analyzed using SPSS analytic software. Cross-tabulations and frequencies show what the various demographics most recognized when it came to brands. This presentation will show the team's findings in terms of brand recognition, loyalty and use.

Presenter(s)-Major: **Cole Hanson - Mechanical Engineering, Daniel Harbert - Applied Mechanical Engineering, Cy Henry - Mechanical Engineering, Robert Rowsam - Applied Mechanical Engineering**
Title: MECHANICAL OILSEED PRESS: UTILIZATION OF OILSEEDS TO PROMOTE SUSTAINABLE PRACTICES BY SUPPLEMENTING THE FUEL SUPPLY OF LOCAL FARMS
Department: Mechanical Engineering Partnership Program, Colorado Mesa University and University of Colorado Boulder
Sponsor: Francisco Castro

Abstract: Modern agriculture requires extensive use of petroleum fuels. The fluctuating price of these fuels can be difficult to manage for small agricultural producers as fuel costs can comprise 10 to 20 percent of a farm's budget. One method for reducing the use of petroleum fuels is by using a Tri-Glyceride Blend (TGB). A TGB consists of a 3:1 blend of straight vegetable oil and gasoline which can be used without extensive processing in diesel engines. Small-scale farm producers could reduce the impact of fluctuating fuel prices by dedicating a portion of their land to an oilseed crop, such as canola, and produce their own fuel if they have access to the facilities to process the seeds. Dr. Perry Cabot from the Colorado State University Agricultural Research Center has sponsored a project to design and construct a mobile oilseed press that will cater to small-scale operators. The screw-type press has the capacity to process five tons of oilseed in a 24 hour period and is housed on a dedicated trailer. The design of the press was inspired by existing concepts, and incorporates a tapered thread screw, conical choke, and adjustable oil drainage.

Presenter(s)-Major: **Neil Harding-Rutledge - Business Administration, Sandra Heley - Business Administration-Hospitality Management, Crystal Manzanares - Business Administration-Hospitality Management, Pricilla Rain - Business Administration-Management**
Title: MESA HAVEN CONCEPT RESORT
Department: Business
Sponsor: Britt Mathwich

Abstract: The purpose of this project is to establish a luxury outdoor experience resort situated on the Grand Mesa located in Western Colorado. This presentation is being done to satisfy the requirements of the class Hospitality Management 450, Strategic Hospitality Sales and Marketing. The requirements for the class project include a six phase development and marketing plan; however, this presentation will only cover the first three design and development stages and the marketing plan. First, the resort concept, including information pertaining to the target market, resort theme, and the competitive market, will be discussed. Second, the presentation will discuss the amenities offered by the resort and how they compare to competitors seeking similar market segments. Last, space design and justification of the resort, along with any additional considerations and the marketing plan will be presented. This resort was designed to cater to leisure travelers seeking an upscale, all-inclusive, lakeside get-away in the beautiful Colorado outdoors. This presentation will cover how the development team intends to bring a unique, lavish, outdoor experience to the Western Slope of Colorado.

Presenter(s)-Major: **Eric Hartline - Physics**
Title: QUANTUM CONDUCTANCE IN GOLD WIRES
Department: Physical & Environmental Sciences
Sponsor: Bill Tiernan

Abstract: We have observed quantized conductance in a gold wire that demonstrates the emergence of quantum mechanical properties in nanoscale wires. A 100 μm gold wire is cut about halfway through and is epoxied to a sheet of spring steel. The wire is then stretched with roughly nanoscale resolution by bending the spring steel with a micrometer. The conductance, $G=I/(\Delta V)$ is monitored as the wire is slowly stretched. Near the breaking point, we observe quantum conductance in the form of discrete integer steps that concur with theoretical predictions of $G=((2e^2)/h)n$, (where $n = 1,2,3,\dots$, e = elementary charge of an electron, and h = Plank's constant).

Presenter(s)-Major: **Bryan Harvey - Mechanical Engineering, Westlyn Johnston - Mechanical Engineering, Keaton Kemper - Mechanical Engineering, Dylan Payne - Mechanical Engineering, William Ramsey - Mechanical Engineering**
Title: TESLA COIL
Department: Physical & Environmental Sciences
Sponsor: Jody Kliska

Abstract: Tesla coils are used to help generate wireless electricity, and have been around since the late 1800's. This project will demonstrate electricity through a created tesla coil. The focus will primarily be upon current, static electricity, frequency, and current transformation. Our Tesla coil will produce electricity which is stored in a capacitor. The capacitor will continue to store the electricity until it can no longer contain the electricity which will create a "jump" to the coils that will be built. The team will demonstrate the functionality of our Tesla coil, and the educational qualities that it possesses. It will demonstrate wireless electricity and the discharge of electricity into the air creating sound waves which can be used to make music.

Presenter(s)-Major: **Nicholas Harvey - Mechanical Engineering, Obinna Nwabia - Mechanical Engineering, William Senn - Mechanical Engineering, Johnathan VanVleet - Mechanical Engineering**
Title: RUBENS TUBE
Department: Physical & Environmental Sciences
Sponsor: Jody Kliska

Abstract: A Rubens Tube can be the light of the party or a great demonstration for physics. This flame tube is an antique physics apparatus to demonstrate acoustic standing waves in a tube. It graphically shows the relationship between sound waves and sound pressure, like a primitive oscilloscope. The purpose of this project is to graphically demonstrate the relationship between sound waves and sound pressures. Rubens tube is a long perforated tube that lets gas in on one end while the other end has a speaker to change pressure by creating sound waves. It was invented in 1905 by Heinrich Rubens and has been used as a physics demonstration since then. The team will demonstrate their knowledge of pressure to flame output and how this information can be used for more applications than interesting club lighting.

Presenter(s)-Major: **Samuel Hebenstreit - Physics**
Title: OPTIMAL INITIAL STATES FOR PARAMETER ESTIMATION FOR THE QUANTUM MECHANICAL AMPLITUDE DAMPING CHANNEL
Department: Physical & Environmental Sciences
Sponsor: David Collins

Abstract: We consider the evolution of quantum systems as time passes. The evolution is of a known form but depends on an unknown parameter. An estimation of the parameter can be established once the system undergoes evolution and is subjected to measurement. The results of measurement are statistically distributed by the laws of quantum mechanics, and thus uncertainty is introduced into our estimation. Uncertainty is bounded by quantum Fisher information. The optimal initial states are those that yield a maximal quantum Fisher information. We consider the evolution of quantum systems transformed by an amplitude damping channel. After passing through the amplitude damping channel, quantum Fisher information is ascertained for these transformed systems. We demonstrate that some initial states yield larger values of quantum Fisher information than others.

Presenter(s)-Major: **Gemma Heimlich-Bowler - Non-Degree Seeking Student**
Title: BIOELECTRICAL IMPEDANCE AS A METHOD OF ESTIMATING THE POST MORTEM INTERVAL
Department: Biological Sciences
Sponsor: Eriek Hansen

Abstract: Law enforcement activities require accurate methods for estimating post mortem interval (PMI). An accurate PMI can be used in identifying victims or validating alibis. The current method for estimating PMI uses visual assessments of decomposition among body segments. The decomposition level is scored according to a Likert scale to calculate total body score (TBS). The PMI is calculated from a linear regression model that predicts accumulated degree days (ADD) using the TBS score. Though useful, TBS has many limitations specifically the subjectivity of the assessor and regional differences in decomposition patterns which affect ADD. Bioelectrical Impedance Analysis (BIA) is used to quantify proximate body composition (fat, water, and lean mass) in living organisms. Specifically BIA measures the resistance and reactance of tissue. Our objective for this study is to evaluate BIA techniques for estimating time of death. We used BIA to systematically quantify changes in electrical resistance and reactance of human cadavers with known times of death at the Forensic Investigation Research Station, Colorado Mesa University. We used the BIA metrics and TBS in multiple regression models and model selection techniques to estimate PMI. Using BIA for estimating PMI provides a more quantitative method for law enforcement to determine PMI.

Presenter(s)-Major: **Francisco Hernandez - Environmental Science and Technology, Lyndsey Karp - Political Science**
Title: AREAS OF OUTSTANDING RECREATION OPPORTUNITY: UTILIZING GEOSPATIAL DATA TO INCORPORATE THE PUBLIC'S PERCEPTIONS INTO THE BUREAU OF LAND MANAGEMENT LAND USE PLANNING PROCESS
Department: Social & Behavioral Sciences
Sponsor: Tim Casey

External Funding Source: BLM grant L14AC00383

Abstract: This research incorporates the use of Geographic Information Systems technology to create a human layer of landscape interaction using the public's perspective on areas of outstanding recreation opportunity within the Bureau of Land Management Royal Gorge Field Office in central Colorado. Land use planners are able to utilize the layer created from research to integrate the public's perceptions of a landscape in conjunction with their Resource Management Planning Process. Data was obtained through in-person focus groups, located within the field office management area. Participants were asked to indicate an area of outstanding recreation opportunity on a common map of the region. Additional information was collected through the use of audience polling technology with a questionnaire to ascertain activity preferences, qualities of the landscape, and what could diminish their area of preference. Geospatial information and data derived from focus groups was plotted using ArcMap 10.1. The created layer can be combined with other geospatial layers such as, oil and gas leases or areas of critical environmental concern to assist in planning around user preferences. The results allow for enhanced planning processes to better comprehend how individuals are connected to the landscape in which they chose to recreate.

Presenter(s)-Major: **Meagan Hillman - Business Administration-Hospitality Management,
George Kearsse - Business Administration-Hospitality Management,
Anna McEndree - Business Administration-Management**
Title: HMG450 MARKETING PLAN FOR THE MONUMENTAL RESORT
Department: Business
Sponsor: Britt Mathwich

Abstract: This HMG450 final semester project is an oral presentation displaying the key characteristics of a proposed urban resort development in Grand Junction, located adjacent to the CMU campus. The resort is anticipated to attract several key target markets to the Western Slope – particularly traveling students visiting CMU, leisure tourists, and business/events travelers – by featuring a range of enjoyable vacation and recreational experiences. For this project a six-phase development plan has been created, three of which will be featured in this presentation: the resort's concept (shaping the resort to the needs of tourist markets), physical offerings (accommodations, facilities, and other spaces), and space design (visual floor-plans and layouts, considerations for the environment and people with disabilities). A key focus of this presentation is the resort's final marketing plan, and how it will position itself to crucial target segments. The ultimate aim of the resort is to drive new tourism and income into the region, applying creative solutions to resort management and design. The purpose of this project is to show the untapped market potential Grand Junction is missing out on, by not having built a major resort.

Presenter(s)-Major: **Rachel Hoge - Liberal Arts-Elementary Teaching**
Title: GIFTED AND TALENTED STUDENTS: DO THEY NEED DIFFERENT TEACHING STRATEGIES TO BE SUCCESSFUL?
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: The teacher candidate has taught two units in the areas of math and social studies. While examining the results of the pre and post assessments, the teacher paid particularly close attention to the results of the five gifted and talented students in a fourth grade classroom with the goal of analyzing student learning. The project was completed based on the motivation to examine student learning and decide if gifted and talented students perform better when the learning is more hands-on (math) or if these students can learn just as well when the assignments are based on readings from a textbook (social studies). To fully understand the presentation, the observer needs to understand how assessment, whether formative or summative, drives instruction and also provides insight into student learning. This inquiry is significant because it will display to teacher candidates and fellow teachers alike if gifted and talented students prefer a certain teaching style, therefore being able to better reach all types of learners. Since the project is based on assessment and student learning, the intended audience involves any type of teacher or person interested in the growth of gifted and talented students.

Presenter(s)-Major: **Amy Hollingsworth - English-Literature**
Title: SETTING AN UNCANNY STAGE
Department: Languages, Literature & Mass Communication
Sponsor: Randy Phillis

Abstract: The Absurdist playwrights of the 20th century used a variety of methods to unsettle their audience's notions and expectations of reality, and one of the powerful tools at their disposal was the stage setting, a sometimes overlooked element in seminal works. This presentation examines how three famous plays, Samuel Beckett's "Waiting for Godot," Eugene Ionesco's "The Chairs," and Harold Pinter's "The Dumb Waiter," use stage settings to create the an uncanny effect that disrupts an audience's understanding of their own world. By comparing and contrasting the setting instructions and stage directions of these plays, a greater understanding of how reality, fiction, and performance are blurred in each work individually, and the implications for the movement as a whole, can be gained.

Presenter(s)-Major: **Morgan Holloway - Liberal Arts-Elementary Teaching**
Title: APPALS
Department: Teacher Education
Sponsor: Cynthia Chovich

Abstract: The Assessment Process, Practice and Analysis Learning Study (APPALS) allows a teacher candidate to put their teaching theories into practical use. This study gives a teacher candidate the opportunity to design, implement, and analyze assessment tools in the classroom. Pre-assessments are an essential influence that guides teacher instruction. This is a significant project because understanding the students' prior knowledge and gaps of knowledge will help teachers determine what lessons should be taught. Pre-assessment can inform teachers what developmental stage students are in, display student strengths, and indicate what students need to learn in the upcoming lessons.

Presenter(s)-Major: **Shannon Howard - Liberal Arts-Elementary Teaching**
Title: TEACHER EFFECTIVENESS OF STUDENTS FROM TRADITIONAL VS. NON-TRADITIONAL FAMILIES
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: Through this project, the researcher determined her effectiveness as a teacher to students of non-traditional families vs. students of traditional families through analysis of pre-assessment data and post-assessment data for two units she taught. The researcher looked closely at the data of one first grade science unit and one first grade writing unit. Although first grade students have many similarities, home life (in addition to other factors) can play a role in students' comprehension of subject matter. The results will help the researcher to improve her effectiveness as a teacher. The researcher expects the results of this study to demonstrate that she is more effective with the students with traditional families than those with non-traditional families, and therefore provides her with a specific goal for improvement. The researcher will share her results of the data analysis of the units as well as the implications and the affect that the information will have on future instruction.

Presenter(s)-Major: **Summer Igo - Environmental Science and Technology, Geoffrey Mattson - Environmental Science and Technology, Drake Shepit - Environmental Science and Technology, Brandon Switzler - Environmental Science and Technology**
Title: REMEDIATION ASSESSMENT AND MONITORING PLAN OF GASOLINE CONTAMINATED GROUNDWATER FROM UNDERGROUND STORAGE TANKS AT AUSTIN COUNTRY STORE IN AUSTIN, COLORADO
Department: Physical & Environmental Sciences
Sponsor: Deborah Kennard

Abstract: The problem of contaminated water from refined oil by-products is nothing new, but the methods used to remediate these sites are not well developed. This study looks at the possible options for gasoline clean-up from contaminated groundwater at Austin Country Store in Austin, Colorado. Conventional practices of contamination remediation cannot be used in this instance because of its close proximity to surface waters and residential neighborhoods. The primary treatment method currently being studied is chemically oxygenated granular activated carbon. Commonly this treatment is effective in household water treatment, but its use on a large scale is widely unknown to the scientific community. The goal of our project is to uncover and further understand the method of reaction and environmental retention which are both not completely understood in groundwater remediation. In order to fulfill that goal we must characterize hydrogeological and other relevant characteristics of the site, list ideal criteria that identifies the most effective and feasible injection option, identify and evaluate groundwater clean-up options (including COGAC injection), develop a post-COGAC injection monitoring plan, carry out one round of sampling for the post-COGAC injection monitoring plan, and evaluate the monitoring results.

Presenter(s)-Major: **Amanda Jablonsky - Business Administration-Hospitality Management, Kelsie Majerus - Business Administration-Hospitality Management, Jazmin McFarland - Business Administration-Marketing**
Title: WESTERN SKIES RESORT
Department: Business
Sponsor: Britt Mathwich

Abstract: Western Skies will be a rustic, high-end lodge established in Mack, Colorado. Three students developed a six-phase resort development and marketing plan for Hospitality Sales and Marketing (HMG 450). Western Skies Resort offers luxurious facilities to give guests the ultimate outdoor experience. Guests have the opportunity to experience the outdoors year round with seasonal "glamping," year round cabins, indoor rock climbing and white water rafting as well as high-end guest rooms featured in our main lodge. In this presentation, the first three phases, as well as the marketing plan, will be discussed. The resort concept includes the target market, location, and competitive analysis. Resort offerings will be discussed, which will include accommodations, facilities, as well as transportation. Finally, space design will be demonstrated, which will consist of resort layout, environmental considerations and a marketing plan. With the support from owners and investors, Western Skies will be able to offer an outdoor experience to a wide array of guests.

Presenter(s)-Major: **Eric James - Master of Business Administration**
Title: IMPROVING THE UTILIZATION OF AN EMR PROCESS
Department: Business
Sponsor: Donald Carpenter

Abstract: Brady Chiropractic Group is a large, multipurpose practice that serves Grand Junction and the surrounding areas. Like many healthcare facilities around the country, Brady has decided to become early adopters of Electronic Medical Record technology, allowing them to easily update and access charts using computers. The complicated nature of the technology has confounded problems with its introduction, and Brady Chiropractic Group would like to see it utilized more efficiently. A review of scholarly literature identified a variety of material on the subject of electronic medical records along with their introduction and associated gains or drops in efficiency. A number of different business tools will be employed in an analysis of the problem, model building, simulation, and recommendations for implementation.

Presenter(s)-Major: **Samantha Jarnagin - Liberal Arts-Elementary Teaching**
Title: APPALS
Department: Teacher Education
Sponsor: Cynthia Chovich

Abstract: This literacy project is a case study on an elementary age student that shows the growth of his literacy elements over the course of a semester. This case study will be using ongoing formative and summative assessments, as well as progress monitoring, to demonstrate understanding of educational foundations and teaching methods course in a continuing field setting.

Presenter(s)-Major: **Melissa Jensen - Nursing-AAS, Wendi Piatt - Nursing-AAS, Eric Reeser - Nursing-AAS, Melinda Smith - Nursing-AAS**
Title: THE IMPORTANCE OF CONSISTENCY IN COMMUNICATION OF CARE, WITH EXAMPLES OF EFFECTIVE AND INEFFECTIVE TEAMWORK
Department: Health Sciences
Sponsor: Genell Stites

Abstract: This presentation will show how detrimental teamwork is in the healthcare field and how devastating to patient care it can be when it's not practiced. Teamwork is valuable in the health care setting, clearly leading to higher quality and more efficient patient care. Communication failures are a common cause of inadvertent patient harm, stemming from the complexities of patient care in the acute and long-term care settings. The presenters will show how proper and improper communication and teamwork can change the care of a patient and alter their experience for the better or worse. Experience has shown that teamwork, the ability to seamlessly integrate skill, knowledge, communication and affective competencies, can improve patient safety and avoid medical errors.

Presenter(s)-Major: **Christy Jersin - Psychology-Counseling Psychology**
Title: PERFECTIONISM AND MINDFULNESS: PREDICTORS OF SEXUAL SATISFACTION IN ROMANTIC RELATIONSHIPS
Department: Social & Behavioral Sciences
Sponsor: Nikki Jones

Abstract: This study aims to analyze the interaction between perfectionism and mindfulness and their prediction of sexual satisfaction in romantic relationships. Literature suggests perfectionism is associated with negative relationship outcomes, however studies mask research that showcases perfectionistic thinking as beneficial to relationships. Theories state perfectionism is multidimensional within a relationship, consisting of self-oriented and other-oriented traits. Each dimension can predict different relationship outcomes. Literature suggests that mindfulness therapy increases sexual satisfaction; however mindfulness is also understood as multidimensional (trait-based and state-based) and could be unfavorable in relationships. Therefore, research was broken into the following phases. Phase 1: The following hypotheses were formulated: (a) Sexual self-consciousness (unhealthy mindfulness) will be negatively correlated with sexual satisfaction; (b) Mindfulness (trait-based) will be positively correlated with sexual self-consciousness; (c) Other-oriented perfectionism and lower levels of mindfulness (trait-based) will predict sexual dissatisfaction; (d) Self-oriented perfectionism and higher levels of mindfulness (trait-based) will predict sexual satisfaction. Participants (n=256) were recruited via social media sites to complete an online survey. Correlational and regression analyses will be conducted. Phase 2: Data collection is ongoing (n=104), adding in state-based mindfulness. State-based mindfulness is expected to account for more variance than trait-based mindfulness, making mindfulness useful in increasing sexual satisfaction.

Presenter(s)-Major: **Corey Jimerson - Business Administration-Finance**
Title: WHICH ARE THE BEST STATES TO START A BREWERY?
Department: Business
Sponsor: Johnny Snyder

Abstract: Craft beer could be one of the most fun, creative, and fulfilling businesses for an entrepreneur to start. But for Colorado, the market is full of so many breweries that it could be difficult for a new large craft brewery to be successful. So if not Colorado, in which states would there be a population receptive to craft beer and would there be room for a new beer brewer? This research attempts to answer this question. By using a multiple regression model, the author attempts to discover the characteristics of a state that make its population inclined to drink beer in order to find which markets would be suitable for a new craft brewery.

Presenter(s)-Major: **Anna Johnson - Biological Sciences-Biology**
Title: THE EFFECTS OF CLIMATE CHANGE ON THE REPRODUCTIVE SUCCESS OF THE ASH-THROATED FLYCATCHER IN COLORADO
Department: Biological Sciences
Sponsor: Susan Longest

Abstract: The advancement of spring arrival is a primary effect of climate change on bird species. Because of this, many species are both moving northward with increasing temperature, as well as advancing their lay date. Using data collected through NestWatch, an online database of nest records through the Cornell Lab of Ornithology, we are able to observe reproductive success across two populations of ash-throated flycatchers. In this study, we examined data collected over fifteen years to determine the effects of varying latitudes on the reproductive success of this species. Our prediction was that across the areas studied in Texas and Colorado, the ash-throated flycatcher will have adjusted its lay date to accommodate an earlier spring and will continue to lay eggs and hatch earlier than in previous years. This prediction was made based on the average temperature increase, as well as the average laying date over the previous 15 years. This study will provide insight on how some species are adapting to a warmer climate and thereby increasing their chances of survival.

Presenter(s)-Major: **Courtney Johnston - History**
Title: WOMEN AND MARRIAGE LAWS IN LATE ANTIQUITY
Department: Social & Behavioral Sciences
Sponsor: Douglas O'Roark

Abstract: The rise of Christianity had far reaching effects across the social spectrum. This religion rose so rapidly to become the dominant religion in the known world and changed the lives of many, none more so than women. When Constantine became the first Christian empire, he began to change the laws to reflect the values of his new beliefs. The laws pertaining to women and marriage were among those most prominent. These new laws marked the beginning of a new role for women especially their role in the household and in legal matters.

Presenter(s)-Major: **Cody Jones - Nursing-BSN, Casey Meade-Gruidl - Nursing-BSN, Morgan Mull - Nursing-BSN, Melanie Ostler - Nursing-BSN, James Whitehead - Nursing-BSN**
Title: IMPLEMENTING AN INTERACTIVE WEB-BASED TOOL TO EDUCATE VACCINE-HESITANT CAREGIVERS
Department: Health Sciences
Sponsor: Bridget Marshall

Abstract: Purpose: A research proposal to determine the efficacy of a web-based tool to increase positive caregiver perceptions of vaccinations and increased MMR vaccination uptake. Problem Statement: There is controversy over the use of the MMR vaccination leading to caregivers being hesitant toward consenting for their children to receive the vaccine. Boulder County has the lowest vaccination rate out of the United States with only 81.7% of kindergartners having up-to-date MMR vaccinations. Methodology: This is a two-tiered, time-series study. Tier one will collect data on immunization rates through the Boulder County Health Department quarterly for two years. Tier two will collect survey information from vaccine-hesitant caregivers that have utilized the interactive web-based tool; Data will be collected semi-annually for two years. The sample will be obtained by surveying voluntary vaccine-hesitant caregivers in Boulder County that participated in the interactive website. We will use both inferential and descriptive statistics to evaluate. Inferential statistics will be used for tier one; descriptive statistics will be used for tier two.

Presenter(s)-Major: **Brianna Joralemon - Psychology-Counseling Psychology,
Selah McMath - Psychology-Counseling Psychology**
Title: THE F WORD: A STUDY OF FEMINISM IN THE CHRISTIAN RELIGION
Department: Social & Behavioral Sciences
Sponsor: Nikki Jones

Abstract: Research shows that Christians reject gender equality via negative views of feminism and continuing established patriarchy structure. Ambivalent sexism consists of two kinds of sexism: hostile and benevolent. Hostile sexism is aggressive action toward females; benevolent sexism is non-aggressive. The researchers predicted a positive correlation between levels of religiosity and ambivalent sexism leading to negative attitudes toward feminism. An electronic survey is being used to collect data. Preliminary demographics revealed 183 participants. Sixteen percent reported being Non-Denominational, Catholic (10%), Baptist (7%), and other Christian faiths. Seventy-four percent were female, 25% male, 80% Caucasian, and 9% Hispanic/Latino. Preliminary results indicate significant correlations between attitudes towards feminism and hostile sexism, as well as benevolent sexism and religiosity. Multiple regression analyses revealed benevolent sexism and religiosity predicted negative attitudes toward feminism, illustrating that sexism could mediate the relationship between religiosity and negativity towards feminism. Religiosity was not a predictor of negative views on feminism; however, both are correlated with higher levels of benevolent sexism, illustrating benevolent sexism may be a link between negative views of feminism and higher levels of religiosity. Results from the final sample and second phase of the study will be analyzed using multiple regression and discussed in further detail.

Presenter(s)-Major: **Harrison Kallina - Computer Science, Andrew Laino - Computer Science,
Beau Lambert - Computer Science, Anthony Nichols - Computer Science**
Title: BARGRAPH ORDER GENERATOR
Department: Computer Science, Mathematics & Statistics
Sponsor: Lori Payne

Abstract: The goal of this project is to design and develop a user interface program and database for Ametek Vehicular Instrumentation Systems Incorporated to aid in the process of generating manufacturing specifications for their bar-graph style gauges. The purpose of this project is to replace the current implementation based on Excel spreadsheets and introduce a modern user-friendly software that will boost productivity, reduce design errors, and streamline the ordering process by leading members of Ametek's sales team through the order generation process. Ametek employees will be able to easily select the design components of their desired gauges and automatically generate the manufacturing specification that will be sent to production. Late project design goals include a port beyond the company itself, extending out to their customers.

Presenter(s)-Major: **Elizabeth Kanaly - Mathematics**
Title: CONVERGENCE OF PERIODIC CONTINUED FRACTIONS
Department: Computer Science, Mathematics & Statistics
Sponsor: Cathy Bonan-Hamada

Abstract: In this poster, properties of convergence of periodic continued fractions are explored. Analytical results and computer generated images illustrating select convergence properties will be included.

Presenter(s)-Major: **Lyndsey Karp - Political Science**
Title: FRAMED: EXPLAINING THE EXCLUSION OF MARGINALIZED GROUPS FROM ENVIRONMENTAL POLICY DEBATES, 1970-2014
Department: Social & Behavioral Sciences
Sponsor: Bill Flanik

Abstract: Environmental scholars have explained how, but not why, marginalized groups suffer from environmental discrimination. This research suggests that environmental discrimination stems in part from how U.S. presidents have "framed" environmental problems. Frames are rhetorical devices that shape audiences' perceptions of issues. These perceptions, in turn, influence the policies adopted in response to the "framed" issue. State of the Union speeches were examined from 1970 to the present to determine how successive U.S. administrations framed environmental questions. The study identifies six major frames and traces their enactment into policy. None of these frames included marginalized populations despite concerted efforts by the Clinton administration to include marginalized groups in the political process. The research, therefore, identifies framing processes as a crucial—and heretofore unexamined—explanation for minorities' exclusion from environmental discourse in the United States.

Presenter(s)-Major: **Tara Kelso - Theatre Arts-Acting/Directing**
Title: CLASSICAL VERSUS CONTEMPORARY OR CLASSICAL CONTRASTS CONTEMPORARY?
Department: Theatre Arts
Sponsor: Maurice LaMee

Abstract: Tara Rose Kelso will be performing Frosine from "The Miser" by 17th century French playwright Molière. "The Miser" is about Harpagon, a penny-pinching, old, rich man who puts money above his children. In this monologue, Frosine, a woman Harpagon has asked to be the go-between himself and Mariane, the young woman he intends to marry, is tip-toeing around trying to get her money from Harpagon for a job well done. The second monologue Tara will be performing is Angela from "U.S. Drag" by Gina Gionfriddo. "U.S. Drag" is about Angela and Allison, two intelligent liberal arts graduates who are not willing to work minimum wage jobs. They acquire free rent by living with Ned, a lonely stockbroker, who they promise to throw parties for. They pick-up men in bars who will pay for their dinners, drinks, and cab fare. In this monologue Angela bluntly tells Christopher, a self-pitying writer she is currently on a double date with (and freeloading off of), what she really thinks of him. Tara hopes to show the contrast and similarities between a classical comedic piece and a contemporary comedic piece.

Presenter(s)-Major: **Kelsey Kiel - Business Administration, Megan Schraeder - Business Administration-Entrepreneurship, Sabrina Trujillo - Business Administration, Malorie Weiss - Mass Communication-Media Strategies**
Title: THE POINT: INTEGRATED MARKETING COMMUNICATION CAMPAIGN
Department: Business
Sponsor: Emma Fleck

Abstract: The Point is a new student pub/eatery located on the Colorado Mesa University campus. Although somewhat popular among students, the marketing and promotional campaigns were having limited success. Given this, the purpose of the project was to design an integrated marketing communications plan with the aim to increase brand awareness, increase sales, and increase student traffic to The Point. With a \$1,500 budget, three unique alternative marketing tools were designed for this purpose. Using three forms of Guerilla marketing techniques (a cup sleeve, a shadow sign and a unique door hanger) combined with other communication tools, the total cost of the campaign was calculated as \$1,441.50. In spending this budget and completing these techniques it is anticipated that sales would increase by \$4,626 and total profit would increase by approximately \$3,000. Due to new and returning customers utilizing The Point, customer traffic and awareness of The Point would also increase. We aim to demonstrate that this campaign could have a positive impact on The Point, not only in profit but also in brand awareness.

Presenter(s)-Major: **Emily Kilgore - Liberal Arts-Elementary-Social Science**
Title: ASSESSMENT PROCESS, PRACTICE AND ANALYSIS LEARNING STUDY
Department: Teacher Education
Sponsor: Cynthia Chovich

Abstract: The project is a case study with three parts: background and objective creation, assessment, and analysis. The project is for the teacher candidate to practice education theories to use in a future teaching career. The objective is for teacher candidates to apply knowledge about assessment and literacy in a field-based setting in order to generate conclusions about implementation and progress monitoring of literacy assessment. The project studied a fourth grade student and progress monitoring of growth in literacy over time. In part I of the learning study, contextual factors were gathered on the student, class, school and district in order to build a full picture of the student environment. In part II, literacy assessment was administered to collect data on the student's baseline literacy levels and the improvement over time. Part III is an analysis of the data and overall experience from a teacher candidate's perspective. The conclusion is based on the analysis of the assessment process in the specific case study and the teacher candidate's experience and growth for future teaching.

Presenter(s)-Major: **Anna H. King - Theatre-Dance**
Title: HEALTHY FOODS FOR DANCERS
Department: Theatre Arts
Sponsor: Megan Glynn

Abstract: Like athletes in sports, dancers are physically active throughout the day. Dancers need to replenish the body with healthy foods. Putting together easy recipes for dancers helps maintain the proper balance of nutrition. In this lecture-demonstration, the presenter will explain how to put together proper meals. The audience will hear the overall dietary impacts of everyday foods that contain unsaturated fats and added sugars. Finally, the presenter will provide the resources to help improve and maintain the proper nutrition throughout the dancer's career.

Presenter(s)-Major: **Anna I. King - Psychology-Counseling Psychology, Hannah Westbrook - Psychology-Counseling Psychology, Curtis White - Psychology-Counseling Psychology**
Title: ARE FRIENDS WITH BENEFITS COMPLICATED? DIFFERENCES IN GENDER, LOVE AND SEXUAL SATISFACTION
Department: Social & Behavioral Sciences
Sponsor: Nikki Jones

Abstract: Literature suggests gender differences exist in friends with benefit relationships (FWBR) in regards to motives, sexual satisfaction, and styles of love. Sternberg's (1998) Triangular Theory of Love has three elements: intimacy, passion, and commitment explaining relationship motives. Males are more likely to be in FWBRs (relationships characterized by a lack of commitment) than females and focus on the benefits part of the relationship, whereas women focus more on the friendship aspect. Further, males report sexual desire as their primary motive for entering FWBRs, while women report emotional connection. Thus, it was hypothesized that less commitment and intimacy, and higher passion would predict sexual satisfaction among males, while higher levels of commitment and intimacy, and lower passion would predict sexual satisfaction for females. Further, gender differences in relationship motives were expected. An online survey method was used for data collection. Preliminary regression analyses yielded no gender differences for styles of love predicting sexual satisfaction. Significant gender differences were found on motivations for FWBRs; specifically, males reported higher coping motives and higher enhancement motives compared to females, suggesting intrapersonally men benefit from FWBRs more than women. Final results will be addressed, and a discussion on the interpretation of these results will ensue.

Presenter(s)-Major: **Bethamie Kinney - Medical Laboratory Technician, John Summers - Medical Laboratory Technician**
Title: MEASLES: IS IT RIGHT TO VACCINATE?
Department: Health Sciences
Sponsor: Tracy Matthews

Abstract: The measles vaccine has been used since 1963, and has proved to be very safe and effective according to the World Health Organization. Approximately one out of every three thousand people that get the vaccination could have a mild to moderate reaction, which can vary with age. Only one out of a million will have severe problems from the vaccine. These severe reactions are so rare it is hard to prove they are associated with the vaccine. Whereas if a person contracts the measles, death can occur in approximately one out of ten infected individuals, especially in countries with malnutrition and poor medical care. However, in the United States the rate of death from the measles is approximately one out of eighty three. If a majority of the population is vaccinated against the measles we can protect the people that are unable to be vaccinated because they are too young or immunocompromised. The spread of measles is reduced by 93% when at least 90% of the population is vaccinated.

Presenter(s)-Major: **Reanna Kissner - Liberal Arts-Elementary Teaching**
Title: THE IMPORTANCE OF STUDENT GROWTH
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: A teacher candidate at Colorado Mesa University gathered and analyzed data in order to identify student learning. The data was gathered from three different units of study in a fourth grade classroom. The goal was to conclude what teaching techniques helped students to show the most growth. Different techniques used included: group research, individual studies, presentations, worksheets, and other formative assessments. The disaggregated data showed the growth of students who received interventions compared to the growth of the other students. Different interventions included: after school studies, ELL services, reading interventions, as well as one-on-one assistance in the classroom. Data was collected through a variety of formal and informal assessments including: checklists, worksheets, tests, quizzes, and anecdotal notes. The data collected helped the student teacher to modify future lesson plans in order to show greater student growth among all learners. The candidate used the data to make appropriate accommodations and modifications as well as to set new goals for student growth.

Presenter(s)-Major: **Cassandra Kraus - Mass Communication-Media Strategies, Lindsey Plambeck - Mass Communication-Media Strategies, Amanda Watson - Mass Communication-Media Strategies**
Title: LIVE FROM NEW YORK... IT'S THE "SNL EFFECT!"
Department: Languages, Literature & Mass Communication
Sponsor: Eric Sandstrom

Abstract: This study examines the powerful influence of the popular late-night sketch comedy Saturday Night Live on political figures through the evaluation of agenda setting theory. SNL has set the political agenda for several presidential elections. By exposing the audience to carefully selected sketches, this program persuades the audience to believe which issues are most important. The foundation of this study is based upon the idea that voter perception is influenced by the portrayal of political

figures. By examining politician portrayals from the 2008 election to the present, it is apparent that the use of agenda setting has a tangible effect on voters' perceptions of political figures and issues. Research is expected to assess the potential impact of political satire. Saturday Night Live is seen as an entertainment platform, but by highlighting current issues and figures it may have a greater impact than pure amusement. The targeted politicians are mocked because of their high influence and their weaknesses are exploited. Saturday Night Live caters to their audience by making these characters more relatable. Viewers have come to expect political satire on SNL and by surveying them, this study will examine how the satire influences their perception.

Presenter(s)-Major: **Kristen Kubiak - Theatre Arts-Music Theatre**
Title: "ACCORDING TO PLAN (WT)"
Department: Theatre Arts
Sponsor: Jeremy Franklin

Abstract: "According to Plan (WT)" is a full-length cabaret by Kristen Kubiak focused around a theme of finding happiness with someone you truly love. Sometimes we have to take the risk and listen to our hearts. It is a topic that everyone can feel a connection with through heartbreak and happiness alike. The presenter will perform "Fifteen Pounds" by Marcy Heisler and Zina Goldrich and will be accompanied by Doug Morrow on piano. This section focuses around the idea that love is something that doesn't, and shouldn't, come easy. "According to Plan (WT)" is a collection of music that captures the emotional extremes of being in love. The intended audience is anyone and everyone who has ever been in love, swept off their feet, or is still waiting for that magical experience we call love.

Presenter(s)-Major: **Kristen Kubiak - Theatre Arts-Music Theatre, Anna McEndree - Business Administration-Management, Mitchell Walker - Business Administration-Management**
Title: THE POINT INTERNSHIP PROGRAM
Department: Business
Sponsor: Georgann Jouflas

Abstract: This oral and visual presentation displays the key characteristics learned over the course of an internship offered by The Point. The Point is a student-led business located within the University Center and is supported by Colorado Mesa University. Thus, The Point internship program offers a hands-on experience that allows students to apply their business knowledge to a viable organization. General Managers/Interns work with the class advisor to oversee and mentor students enrolled in MANG 396. Students concentrate on four pillars: human resources, marketing, finance, and operations. Information and data provided throughout the presentation covers these four pillars and has been collected from students within the class, as well as the interns. Outside of the classroom, interns manage The Point, network with experts in the field, receive advice from professionals, and gain an understanding of day-to-day business operations. By participating in the class or taking an internship, students receive a unique opportunity provided by the University. The purpose of this presentation is to showcase the valuable experience available to students.

Presenter(s)-Major: **Rochelle Kwasniewski - Theatre Arts-Music Theatre**
Title: "OOH, MY FEET" FROM KWASNIEWSKI'S CABARET: "TACO HOUSE LOVE"
Department: Theatre Arts
Sponsor: Jeremy Franklin

Abstract: "Taco House Love" is a full-length autobiographical cabaret written and performed by Rochelle Kwasniewski with piano accompaniment by Douglas Morrow. The presenter will perform "Ooh My Feet" by Frank Loesser from the musical "The Most Happy Fella." The cabaret is about the comical events of the Kwasniewski family told by Rochelle. This section of the cabaret focuses on her two brothers struggling to earn a living while pursuing a career in showbiz. The subject is approached through a Golden Age musical theatre point of view with tap dancing to express the comedic approach to the subject.

Presenter(s)-Major: **Joseph Labrum - Computer Science, Amanda O'Connor - Mathematics**
Title: ANDROID SURVEY APPLICATION
Department: Computer Science, Mathematics & Statistics
Sponsor: Warren MacEvoy

Abstract: A survey application was created to help The Point survey and track its customers. It provides a simple intuitive interface for customers to answer survey questions. It allows management to customize questions and export results through a password protected management menu. This will help The Point advertise to customers and better understand their customers' needs. Though designed for The Point, the presentation will show how this application is usable by and beneficial to any business.

Presenter(s)-Major: **Joseph Labrum - Computer Science, Logan Nagel - Computer Science, Eric Ziegler - Computer Science**
Title: INTERACTIVE CAMPUS MAP
Department: Computer Science, Mathematics & Statistics
Sponsor: Lori Payne

Abstract: Colorado Mesa University has seen impressive growth in both student population and the physical size of the campus. New buildings are added on an almost yearly basis to accommodate the growing demands for classroom and living space. While maps of the campus are available for students and visitors to use, they are difficult to find. This project will combine all of the available map resources into a single, easy to use computer program. The program will include search functionality, allowing the user to type in the room number or location they are looking for and the Interactive Campus Map will display its location. The Interactive Campus Map will help students and visitors navigate the campus, and also reduce strain on campus staff that would normally have to guide people around the campus.

Presenter(s)-Major: **Rebecca Langley - Nursing-AAS, Lorie Spencer - Nursing-AAS, Claudia StPeter - Nursing-AAS, Robin Tofflemoyer - Nursing-AAS**
Title: TRAVELING WITH DIABETES
Department: Health Sciences
Sponsor: Genell Stites

Abstract: Roughly 2.9 million Americans suffer from diabetes and its complications. The purpose of this topic is to teach and empower diabetics, their family members, and care givers about important safety tips regarding traveling with diabetes. Diabetes doesn't have to limit a person's life or travel destinations. The information presented will encourage and inspire diabetic patients on how to pack, plan, and stay safe with airline travel, vehicle travel, and out of the country travel. This project focuses on key tips that can help diabetics travel with less concern of experiencing a hyper or hypoglycemic event.

Presenter(s)-Major: **Logan Lans - Physics**
Title: X-RAY DIFFRACTION ANALYSIS OF LITHIUM ION BATTERY MATERIALS
Department: Physical & Environmental Sciences
Sponsor: Brian Hosterman

Abstract: LiMn_2O_4 is a popular cathode material for Lithium Ion batteries, but suffers from structural instabilities. Doping the material with excess Lithium will introduce Li_2MnO_3 as a doping agent which can improve stability in small quantities. LiMn_2O_4 Spinel material was synthesized using a solid state reaction at varied temperature and times. The resultant powder was analysed using X-ray diffraction and refined using Rietveld refinement method to produce quantitative phase data. The resulting powders contained a mixture of spinel group LiMn_2O_4 and monoclinic Li_2MnO_3 with concentrations depending greatly on calcination temperature and Lithium fractions. The dependence on temperature for the Li_2MnO_3 in the material presents the potential for a stable lithium ion cathode material.

Presenter(s)-Major: **Patrick LaPorta - Liberal Arts-Elementary Teaching**
Title: ASSESSMENTS IN ELEMENTARY EDUCATION
Department: Teacher Education
Sponsor: Cynthia Chovich

Abstract: Education has become a very assessment-based profession. Assessments are created not only to meet the educational needs of the students but also to provide beneficial and effective indications of students' developmental stages along with their learning strengths. This study will review how collecting and analyzing data is an essential aspect to assessment, and how this process will better equip an educator to maintain continual growth in each student. This is significant because inside every classroom no two learners are the same. Teachers must be able to satisfy each and every student's needs to the best of his/her ability. By using ongoing formative and summative assessments in the everyday classroom and translating that into collecting and analyzing data, teachers will become better prepared and will be able to keep up with students' ongoing needs.

Presenter(s)-Major: **Alyssa Lehmann - Mathematics**
Title: LITTLEWOOD-RICHARDSON PROBLEM FOR SCHUBERT POLYNOMIALS
Department: Computer Science, Mathematics & Statistics
Sponsor: Shawn Robinson

Abstract: The Littlewood-Richardson Problem for Schubert Polynomials is a counting problem for intersections of geometrical objects. It remains an open problem. This project will detail the Littlewood-Richardson problem and will also discuss the need for the problem itself. Furthermore, we will approach this problem using a different set of polynomials that are in the same vector space as the Schubert Polynomials to see if we can gain any insight into a solution of the Littlewood-Richardson problem.

Presenter(s)-Major: **Matthew Lidberg - Computer Science, Yvon Mbala - Computer Science, Tarrell Rodrigues - Computer Science**
Title: CASUAL DAY
Department: Computer Science, Mathematics & Statistics
Sponsor: Warren MacEvoy

Abstract: If you have worked in or attended a community where uniformity and dress guidelines are a must, then you understand that collaborative appearance can be hard to initiate. In fact, most of the time finding out what to wear to a company gathering, retreat, or themed general meeting, is usually found out through bulletin boards, email memos, and word of mouth. The purpose of this project is to create a way to inform community members on what to wear.

Presenter(s)-Major: **Dakota Lindsey - Geology**
Title: PALEOSOLS OF THE OHIO CREEK FORMATION, SHALE RIDGE AREA OF THE PICEANCE BASIN, WESTERN COLORADO
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

Abstract: A long standing controversy exists over the age and stratigraphic relations among rock units spanning the Cretaceous-Tertiary transition in western Colorado. Across this transition, the rock record in western Colorado is highly variable and includes the Ohio Creek Formation, which is underlain by the Upper Cretaceous (?) William Fork Formation and overlain by the Paleocene-Eocene Wasatch Formation. One key aspect of the controversy are the paleosols associated with these rock units. Paleosols are fossil soils that represent a time in geologic history when a system was stable enough for vegetation to exist and for chemical leaching to produce soil horizons. The development of a paleosol is controlled by rates of erosion, base level, biologic activity, climate, and tectonic activity. This project will provide detailed information regarding root structures, soils horizons, and soil structures, which will be used to produce the first classification of the paleosol(s) near Shale Ridge. Chemical and mineralogical analyses using x-ray diffraction, x-ray fluorescence, and possible thin-sections will be used to characterize the paleosols. This project will provide the first focused paleopedological analysis of the Ohio Creek Formation in western Colorado.

Presenter(s)-Major: **Hannah Liss - Psychology-Counseling Psychology, Alicia Sawatzky - Psychology, Rachel Wagster - Psychology**
Title: ROCKY MOUNTAIN HIGH
Department: Social & Behavioral Sciences
Sponsor: Jake Jones

Abstract: There is a growing concern regarding the impact of marijuana use on Colorado residents since becoming the first state to legalize recreational use. The present study examines the relationship among marijuana, alcohol, and emotional intelligence. Previous research indicated that emotional intelligence levels, ability to manage emotions, and sense emotions in others were inversely correlated with alcohol and marijuana use (Claros & Sharma, 2012). Research involved collecting data via electronic survey at two points during two semesters. The first survey was conducted through a hyperlink that was posted on Facebook and emailed to students. We collected information on demographics, alcohol and marijuana use, and emotional intelligence with the Schutte Self Report Emotional Intelligence Test (SSEIT) (Schutte et al. 1998). A total of 350 participants completed the initial survey; the majority of the population was female ($n = 261$), Caucasian ($n = 304$), with a mean age of 25.76 years. A national survey found that 36% of individuals age 18-29 have tried marijuana, compared to our finding of 52.5%. National data found that 30% of women have tried marijuana; this number was 50.9% in our study. A total of 47% of men have tried marijuana compared to 57.4% in our data. The data revealed that men scored significantly higher than women on the SSEIT subscales of appraisal of others emotions, $F(1, 341) = 4.467$, $p = .035$, and regulation of emotions, $F(1, 343) = 15.648$, $p = .000$. Scores on the optimism subscale of the SSEIT predicted age of first alcohol use, $F(1, 346) = 8.293$, $p = .004$. Additionally, scores regarding the utilization of emotions subscale predicted whether or not a person uses marijuana 57% of the time ($p = .013$). The amount of alcohol someone consumes in one setting predicted whether or not a person uses marijuana 59.6% of the time ($p = .000$). These differences

suggest that the influence of the legalization of recreational marijuana has a strong influence on usage. Based on the results of our research, we conclude that the legalization of marijuana has had a stronger impact on women due to the decreased legal ramifications. Further examination of our data after the second data collection will be discussed.

Presenter(s)-Major: **Allyce Lobdell - Sociology**
Title: THE CRIMINAL ATHEIST: A COMPARISON OF BELIEVERS AND NON-BELIEVERS IN CRIME AND SOCIAL INTEGRATION
Department: Social & Behavioral Sciences
Sponsor: Isabella Kasselstrand

Abstract: A misconception in contemporary America is that morality is tied directly to religion. Conversely, some scholars argue that it is the social, communal aspect of religion which provides the basis of moral behavior. Morality is relative and difficult to compare and measure, leaving few options to gauge morality across religious and non-religious individuals. Crime provides one conception of morality which both secular and religious can agree on. This study adds to the discussion on religion and morality by exploring fundamental sources of moral behavior in contemporary society. Using data from the General Social Survey (2012), this study examines the relationship between types of crime, religious beliefs, religious belonging, and group solidarity. From a Durkheimian perspective, the study investigates whether morality has a stronger link to social integration than to religious beliefs. The authors predict that there is no significant relationship between religious beliefs and morality. However, they expect that religious belonging and sense of attachment to a social group explains variations in criminal behavior. The authors explore whether the link between group belonging and morality applies to secular entities. They predict that an association with social groups (e.g. voluntary organizations) have a similar effect on morality as does religious attachment.

Presenter(s)-Major: **Brooke Lucas - Master of Business Administration**
Title: IMPROVING WEBSITE TRAFFIC FLOW TO INCREASE CONVERSION
Department: Business
Sponsor: Donald Carpenter

Abstract: The Internet has enabled the creation of a new electronic commerce market. In this market, sellers can quickly and cost effectively build a virtual storefront, one that consumers all over the world have access to. Buyers have a plethora of websites to explore when searching for products. With the vast array of websites available, it becomes important for website designers to build websites that are appealing and drive the customer to purchase products. This presentation will explore how website designers can improve customer traffic flow to increase the number of purchases. The results of the research show that even small changes to a website can have a statistically significant difference on conversion rate.

Presenter(s)-Major: **Robert Lueck - Mechanical Engineering, Christopher Rowley - Applied Mechanical Engineering, Alex Zemezouak - Applied Mechanical Engineering**
Title: RESEARCH AND DEVELOPMENT OF AN EFFECTIVE WOOD STABILIZATION PROCESS
Department: Physical & Environmental Sciences
Sponsor: Scott Bevill

Abstract: The purpose of the project was to develop an effective wood stabilization process for small applications that consisted of impregnating Methacrylate Esters into wood. The group investigated wood species of hard maple, black walnut, and redwood while using infusion time and pressure levels as prominent variables to optimize the process. Preliminary experiments were carried out to determine appropriate parameters for testing. The effectiveness of the process was quantified by measuring the change in density, water absorption, and hardness, which are commonly evaluated to quantify a stabilization process. Preliminary results suggest that increasing the infusion time up to two hours is adequate. It was also shown that increasing the pressure level to an attainable level for a woodworking hobbyist expedited the process. It was determined that the drastic differences in wood microstructures, between wood species greatly influenced the stabilization process; therefore stabilization processes are species dependent.

Presenter(s)-Major: **Andrew MacDonald - Mechanical Engineering, Dylan Osborne - Mechanical Engineering, Austin Smith - Applied Mechanical Engineering, Max Spangler - Mechanical Engineering**
Title: IMPLEMENTATION OF A MODERN HYBRID APPLICATION SYSTEM
Department: Physical & Environmental Sciences
Sponsor: Sarah Lanci

Abstract: Auto manufacturers consistently face pressure from consumers for increased fuel efficiency in vehicles. As a result, many auto makers have implemented hybrid technology into modern vehicles. In order to demonstrate the efficiency of the hybrid

theory, it was decided to build and test a similar hybrid system and apply it to a bicycle. The goal of this project was to measure the average output of energy produced by an individual in order to reach a given speed on a bicycle and compare it to the energy required to reach the same speed by an individual using the hybrid application system. This project will ultimately strive to exhibit the benefits of a hybrid system in a practical day-to-day application.

Presenter(s)-Major: **Haley MacDonald - Hospitality Management, Brendan McGinnis - Business Administration-Hospitality Management, Kathryn Oshiro - Business Administration-Hospitality Management**
Title: PARADISE IN PALISADE
Department: Business
Sponsor: Britt Mathwich

Abstract: This presentation is for the Hospitality Management 450 class and includes a conceptual development and marketing plan for a unique resort located Palisade, Colorado. This presentation will focus on the first three of six phases, including the marketing plan. During this process, a group of three students will develop a resort concept which is the main part of phase one, resort offerings will be outlined in phase two, and in phase three the design and layout of the resort will be constructed, and a marketing plan will be developed. This resort is located on a seven-acre vineyard overlooking the beautiful vistas of the Grand Valley. It is focused around the wine of the Grand Valley as well as some of the five star amenities including winery, restaurant and bar, as well as a premier wine spa.

Presenter(s)-Major: **Shayley MacQueen - Theatre Arts-Dance**
Title: FROM PAGE TO STAGE
Department: Theatre Arts
Sponsor: Megan Glynn

Abstract: During a six week dance intensive attended in Durham, NC during the summer of 2014, a dance composition class used several different techniques to aid in the creative process of developing a piece of choreography. Some of the processes the class went through that were crucial to the finished product will be explained. The audience will be informed of the steps taken from day one of the class to the class presentation performed at the end of the six weeks. The after effects of the class and performance will also be explained and how they have been put into use since the end of the summer. There will be a short performance of an excerpt from the full piece. The excerpt was created through guidelines from the teacher of the class as well as peer input and assistance from classmates. It is important to show variety when it comes to teaching a composition class and make sure you teach differently than others around you. It is also important to understand the progression of this class and how we were able to create an almost fifteen-minute piece by starting out decorating journals. The techniques and processes not only gave inspiration to the class but also gave the students material and methods to take with them into their own choreography.

enter(s)-Major: **Nathan May - History**
Title: COME AND SEE: ART AND THE DEVELOPMENT OF WESTERN EUROPE'S CULTURE OF DEATH
Department: Social & Behavioral Sciences
Sponsor: Douglas O'Roark

Abstract: This paper will discuss the development of images of death in Western Art showing how it developed its own distinct culture. Case studies will be viewed in the art and literature produced around the fourteenth century throughout Western Europe as well as the Byzantine Empire. Distinctions will be made showcasing the split between the two artistic styles as well as cultural and theological mindsets of Orthodox Christianity and Roman Catholicism. The development of this split will be analyzed in order to better understand the artistic subjects and their theological and cultural meanings. Such analysis is intended to explain the difference between the subjects of art and literature, showing how one was saturated in death while the other was not. Detailing such differences will also show how each society interpreted times of crises like the fourteenth century as well as explaining their actions to such events as the Black Death.

Presenter(s)-Major: **Joseph Mazza - Geosciences-Geology**
Title: PROVENANCE OF THE RED SILTSTONE RIVER GRAVELS FOUND IN TERRACES NEAR GATEWAY AND WHITEWATER COLORADO
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

Abstract: The Unaweep Canyon is an interesting subject that has led to much research by many geologists trying to decipher whether the Colorado River or the Gunnison River cut the canyon. It is generally accepted that the Gunnison River was the likely river that formed Unaweep Canyon at some point, but recent research has shown that there is a possibility that the Colorado River

could have cut through the canyon as well. Samples of red siltstone river gravels similar to the ones found in the Colorado River have been found in fluvial terraces outside of Gateway and Grand Junction. With this new finding, it is theorized that both the Colorado and Gunnison Rivers cut Unaweep Canyon. This theory leads to the possibility that the Colorado River was subject to stream piracy by tributaries north of the Colorado River, which led to the abandonment of Unaweep Canyon. The main purpose of this research project is to locate red siltstones in terraces around Grand Junction to see if they represent the ancient Colorado River. Correlating the terraces and locating the provenance of the siltstones will help clarify the origin of Unaweep Canyon.

Presenter(s)-Major: **Curtis McCormick - Accounting-Public Accounting, Michael Melillo - Business Administration-Finance, Taylor Schultz - Business Administration-Finance, Sean Winslow - Business Administration-Finance, Tawnee Woosley - Business Administration-Finance**
Title: SPORTS APPAREL AND FOOTWEAR INDUSTRY FINANCIAL SCENARIO ANALYSIS
Department: Business
Sponsor: Morgan Bridge

Abstract: Through this presentation the audience will be introduced to the key competitors of the sports apparel and footwear industry, while also discussing different financial scenarios among the competitors. The group will discuss scenarios such as projected sales and the availability of required financing along with other financial scenarios. The group will then end with any assumptions that have been made while conducting research and future recommendations.

Presenter(s)-Major: **Jessica McKnight - Theatre Arts-Music Theatre**
Title: A PERFORMANCE OF "IN SHORT" AND "WHERE I STOOD" FROM JESSICA'S CABARET: "HERE'S MY THANKS TO THE MONSTER"
Department: Theatre Arts
Sponsor: Jeremy Franklin

Abstract: "Here's My Thanks to the Monster" is a full-length autobiographical cabaret written and performed by Jessica Rae McKnight with piano accompaniment by Doug Morrow. The presenter will perform "In Short" by Pasek and Paul and "Where I Stood" by Missy Higgins. This cabaret was written to show the journey of self-discovery through the trials of a failing relationship. This section of the cabaret allows the presenter to show an honest, inside look at her struggle for freedom through comedy and drama.

Presenter(s)-Major: **Candace McLeod - Liberal Arts-Elementary Teaching**
Title: ASSESSMENT PROCESS, PRACTICE AND ANALYSIS LEARNING STUDY (APPALS)
Department: Teacher Education
Sponsor: Cynthia Chovich

Abstract: The Assessment Process, Practice and Analysis Learning Study (APPALS) is a case study that focuses on assessment in the classroom and how assessment guides instruction. Pre-assessments are significant because they allow for the teacher to see the background knowledge the students have before teaching a topic. Post-assessments are significant because they allow for the teacher to see and analyze the growth of each student. Assessments such as these should be done for the students. The significance of this case study is to analyze data and use ongoing formative and summative assessments to differentiate instruction for the student the case study is being done on. The pre-assessments give way to next steps of the teaching process, such as what to teach and how to teach it to meet the needs of each student in the classroom.

Presenter(s)-Major: **Caylin Meyers - Nursing-BSN, Kylie Mozingo - Nursing-BSN, Tarah Neam - Nursing-BSN**
Title: EXPLORING THE CORRELATION BETWEEN EDUCATION AMONG MOTHERS DURING PREGNANCY AND PEDIATRIC IMMUNIZATION RATES
Department: Health Sciences
Sponsor: Bridget Marshall

Abstract: The current study is a research proposal to determine if there is an increase in pediatric immunizations after providing thorough education regarding immunizations throughout the mothers' pregnancy. Problem statement: Information regarding timing of education is limited; there is a gap in knowledge regarding whether or not immunization education during pregnancy is beneficial to increasing the incidence of pediatric immunizations. Research question: Will immunization education during pregnancy increase pediatric immunization rates? Methodology: By conducting a longitudinal cohort study, the progress of immunizations in children will be monitored during their first two years of life whose mothers have received teaching during prenatal visits. The sample for this study will be pregnant mothers in Mesa County who are seeing an Obstetrician/Gynecologist (OB/GYN) during 2015-2017. An educational presentation will be provided to pregnant mothers through one-on-one

conversations by the registered nurse during prenatal visits scheduled at 28-30 weeks and 34-36 weeks. After the child is born, by following their immunization progress through two years of age, inferential statistics will be used to compare these results to previous immunization rates in Mesa County.

Presenter(s)-Major: **Tawni Middleton - Biological Sciences-Biology**
Title: EXPLORING EVOLUTIONARY RELATIONSHIPS IN THE GENUS *Solanum* USING NEW GENETIC MARKERS
Department: Biological Sciences
Sponsor: Stephen Stern

Abstract: Phylogenetics is the study of evolutionary relationships between and among groups of organisms. These relationships are inferred by examining the morphological traits or genetic sequences of species in that group. Since the advent of DNA sequencing and methods for phylogenetic analysis, much work has been done to resolve the phylogenetic tree of life. Our interest lies in understanding the evolutionary relationships within the plant genus *Solanum*, specifically *Solanum* sect. *Androceras*. *Solanum* is one of the most economically important among plant genera of the world. It produces crops of great significance such as the tomato, potato, and eggplant. In addition to understanding how species are related, we are also interested in examining the utility of genes that have not previously been used in *Solanum* phylogenetics. Our results indicate that three Pentatricopeptide Repeat (PPR) genes and two genes from the chloroplast (*ndhF-rpl32* and *rpl32-trnL*) greatly increase the likelihood of resolving the phylogeny of *Solanum* sect. *Androceras*.

Presenter(s)-Major: **Demitri Miller - Theatre Arts-Acting/Directing**
Title: "EAST"
Department: Theatre Arts
Sponsor: Maurice LaMee

Abstract: A piece from the play "East" which was written by Stephen Berkoff in 1975 will be performed by Demitri Miller. Although written in earlier years "East" is considered a contemporary play that still deals with themes that can affect a modern day audience such as the idea of a rite of passage. The specific monologue chosen to be performed is light-hearted and funny but will also cause critical thinking among the spectators due to a major dramatic twist. Contemporary drama in the 21st century is more commercially produced and will allow the performer and the audience to closely relate to the monologue as a whole.

Presenter(s)-Major: **Rebecca Miller - Chemistry**
Title: THE USE OF GOLD (III) COMPLEXES IN STRONG C-H BOND ACTIVATION
Department: Physical & Environmental Sciences
Sponsor: David Weinberg

External Funding Source: American Chemical Society grant 53723—UNI3

Abstract: The use of organic compounds affects most every aspect of modern life. Most of these compounds are not naturally abundant and must be generated from hydrocarbons such as methane and hexane. Because C-H bonds in hydrocarbons are especially strong and stable, and therefore unreactive, these organic compounds must be generated through indirect, energy-intensive, often expensive and significantly waste producing processes. Model systems have been developed to use gold (III) in a more direct functionalization of C-H bonds similar to those in hydrocarbons. Several novel gold (III) complexes have been produced and there is evidence that a C-H bond breaking reaction has taken place. Further investigation into the use of gold (III) complexes in strong C-H bond activation could lead to more direct hydrocarbon C-H bond activation.

Presenter(s)-Major: **Kevin Mitchell - Mathematics-Statistics**
Title: WHERE WINS COME FROM
Department: Computer Science, Mathematics & Statistics
Sponsor: Darren Gemoets

Abstract: In sports, as in the business world, a strong cohesive group is important for success. In the business side of sports, a common question dealt with is how and where to allocate personnel. In the recent history of baseball, statistics has played a paramount role in the success of building a championship contending team. In baseball there are two very distinct groups of position players: infielders and outfielders. These two have very different roles but both are vital towards success for their teams. But when it comes down to building a strong team where should the emphasis be placed, infield or outfield? Using ratings based off of individual performance, an average group rating for both infield and outfield can be compared to a team's winning percentage. Linear regression and logistic regression helps show which of the two groups have more significance when it comes down to winning.

Presenter(s)-Major: **Anna Mixon - Liberal Arts-Elementary Teaching**
Title: STUDENT GROWTH
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: The focus of this project was gaining more knowledge on how assessment data guides classroom instruction for elementary English Language Learners. The goal was to determine which instructional methods were and were not successful and to understand how English Language Learners learn best. The data to complete this project was gained through the teaching of two units. The research shows that there are a variety of successful instructional strategies. This presentation is intended for educators and for parents with young children learning English as a second language.

Presenter(s)-Major: **Selina Najar - English-Writing**
Title: PRETTY WOMAN: A ROMANTIC TRAGEDY
Department: Languages, Literature & Mass Communication
Sponsor: Barry Laga

Abstract: The box office hit *Pretty Woman* starred Julia Roberts as a self-employed prostitute named Vivian Ward alongside Edward Lewis, the suave, successful businessman played by Richard Gere and was released in 1990, grossing \$178,406,268 in the United States alone. The film continues to be substantially popular, 25 years after its release. The movie is widely accepted as a formulaic, Pygmalion and Galatea-esque romantic comedy. Professor and scholar Michael Goldberg classifies *Pretty Woman* as a "Rom-Com," because of its "predominantly female audience" and the text's intention of "focusing the audience's attention on the drama of romance and on the promise of the ultimate bliss of heterosexual love." But this classification of the film may not be wholly accurate. Vivian was initially an independent, self-reliant, and hardworking woman, but suffered the death of her autonomy by abandoning her educational aspirations and desire to be self-sustaining for the twice-divorced businessman. If the paramount element of a romantic comedy is the happiness and fulfillment of the protagonist, what does that mean for this film's genre? Resulting from CMU's Introduction to Literary Theory and Criticism course, "*Pretty Woman: A Romantic Tragedy*" discusses how *Pretty Woman* meets the criteria for and is a classic tragedy.

Presenter(s)-Major: **Braden Neptune - Mathematics-Statistics**
Title: SEEING THROUGH THE ACRYLIC: REYNOLDS POLYMER
Department: Computer Science, Mathematics & Statistics
Sponsor: Rick Ott

Abstract: Reynolds Polymer is an industry leader in manufacturing large-scale aquariums. The acrylic used to make the aquariums needs to be as transparent as possible. If the acrylic doesn't meet certain clarity specifications then the product is useless. In this poster we look at four factors that contribute most to the clarity of the acrylic. These four ingredients are Tinuvin, Crosslinker, Polymer and Monomer. A multiple linear regression equation that will predict the overall clarity by entering in the values of the ingredients is investigated. With these results Reynolds Polymer will be able to determine the clarity of the final product with 95% confidence before the ingredients are even mixed together for production.

Presenter(s)-Major: **Douglas Nichols - Geosciences-Geology**
Title: TITLE: PROVENANCE OF THE BROWNS PARK BASAL CONGLOMERATE AND BISHOP CONGLOMERATE BASED ON DETRITAL ZIRCON SPECTRA
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

External Funding Source: This research is based upon work supported by the National Science Foundation under grant No. EAR-1119635

Abstract: Traditionally the Bishop Conglomerate and Browns Park Formation of northwest Colorado are interpreted to represent a period of erosion and tectonic quiescence. Geologists surmise Bishop Conglomerate rivers flowed east away from the Uinta Mountains, and were older than Browns Park rivers, which flowed west away from the Park Range. However, new detrital zircon studies reveal that the Browns Park basal conglomerate and Bishop Conglomerate overlap in age and have additional sources like the Flat Tops of northern Colorado. Analysis of detrital zircon samples from these units reveals that each source area has a distinctive detrital zircon signature. For example, the Browns Park basal conglomerate at Ripple Creek in the Flat Tops has 200-300 Ma grains. Formations in the region that share these ages lie to the southwest. Furthermore the Ripple Creek sample lacks 1300-900 Grenville grains and 1700-1400 Yavapai grains, which are abundant in the Uinta Mountain and Yampa Valley source areas, respectively. These differences support the presence of a third source area to explain the provenance of the detrital zircon

grains. Understanding the timing and provenance of these formations is important to determine whether a post-Laramide episode of tectonism occurred in the Rocky Mountain region.

Presenter(s)-Major: **Amanda O'Connor - Mathematics**
Title: THE MATH BEHIND THE IMAGE
Department: Computer Science, Mathematics & Statistics
Sponsor: Phil Gustafson

Abstract: Digital images can be interpreted as an array of numbers; specifically a matrix of values. These matrices can be represented in terms of a wavelet basis. From here, many image processing techniques can be implemented, such as image compression. This project goes behind the mask of image processing programs to show the details and complexity of the mathematics required to do such techniques.

Presenter(s)-Major: **Colton Olson - Psychology, Whitney Rowe - Psychology, Ashley Winsor - Psychology-Counseling Psychology**
Title: A STUDY OF TEAM COHESION AND EMOTIONAL INTELLIGENCE
Department: Social & Behavioral Sciences
Sponsor: Jake Jones

Abstract: Emotional intelligence has recently become more prevalent in sport psychology research. Independently, the results of previous research show that team cohesion and emotional intelligence enhances sporting performance (Zizzi et al., 2003). In addition, previous research indicated differences between athletes and non-athletes in regards to emotional intelligence (Szabo & Urbán, 2014). However, no research until now has directly studied the relationship among emotional intelligence and team cohesion, as well as differences in athletes and non-athletes in emotional intelligence. Thus, we hypothesized that a positive correlation between emotional intelligence and team cohesion exists. Additionally, we hypothesized that differences in emotional intelligence occur between athletes and non-athletes. We collected data with an electronic survey containing the Emotional Intelligence Scale (Schutte et al., 1998), the Group Environment Questionnaire to measure team cohesion (Carron et al., 1985), and demographic questions. The researchers individually approached head and/or assistant coaches for 20 NCAA Division II athletic teams, in pursuance of participants ($n = 139$). We had mainly Caucasian ($n = 94$) participants with 59 males and 80 females, from 13 intercollegiate sports teams. The results of our study showed no significant relationship among team cohesion and emotional intelligence. However, we did find significant differences between teams on group task cohesion. Specifically, women's track and field, lacrosse, and basketball had higher scores on group task cohesion than men's soccer, $F(11,127) = 2.075$, $p = .027$. In addition, we compared athletes to non-athletes ($n = 391$). Results indicated significant differences in scores of appraisal of others emotions, where athletes had higher scores than non-athletes, $t(141) = -11.096$, $p = .000$. Non-athletes had higher scores than athletes for social skills, $t(144) = 3.909$, $p = .000$, and appraisal of own emotions, $t(145) = 2.868$, $p = .005$. We believe the differences in athletes and non-athletes in appraisal of others emotions results from the sport environment and the necessity of developing the ability to read others emotions while participating in sport. In addition, non-athletes have higher social skills than athletes due to the increased demand of sport on the time of athletes which leaves less time for socialization outside of sport. Further analyses will be explained in the presentation.

Presenter(s)-Major: **Michael Partlow - Biological Sciences-Biology**
Title: PREDICTING FISH MOVEMENT THROUGH TWO SELECTIVE FISH LADDERS IN THE GRAND VALLEY, COLORADO
Department: Biological Sciences
Sponsor: Eriek Hansen

Abstract: Though poorly understood, fish movement patterns are ecologically important and are associated with reproduction, habitat selection, or possibly other unknown reasons. Cues that initiate fish movement include flow, temperature, photoperiod, and barometric pressure. The U.S. Fish and Wildlife Service has operated two fish ladders with traps on the Colorado River (9 years) and the Gunnison River (18 years) that capture fish moving upstream. To understand fish movement patterns, we used multiple linear regression modeling to predict fish movement, and selected the best models using Akaike Information Criterion (AIC). Multiple regression models included the metrics: species, stream discharge (mean flow, minimum flow, maximum flow, and coefficient of variation), atmospheric conditions (temperature and barometric pressure), and photoperiod (date). This study may have important implications for the management and conservation of native fish species in the Colorado River Basin, four of which are federally listed as endangered and three species are considered of conservation concern. An improved understanding of the movement behavior of Colorado River fishes will add to the general understanding of the ecology of these fishes, and provide important insight into how barriers to fish movement, such as low head dams, may affect the ecology of these fishes.

Presenter(s)-Major: **Tyler Paulson - Mass Communication-Media Strategies,
Jordan Price - Mass Communication-Media Strategies**
Title: NORTH KOREA TAKES ON SILENCING FREE MEDIA: FOLLOWING THE NORMATIVE THEORY
Department: Languages, Literature & Mass Communication
Sponsor: Eric Sandstrom

Abstract: America and North Korea have different laws, but what happens when they collide? This project applies the normative theory to a media event that involved the Sony hack, created between the United States and North Korea. This project will demonstrate how North Korea silenced Free Media for a short period of time by hacking Sony Entertainment. Normative Theory, concerned with what the media should do rather than what they actually do, may be used to help explain the controversy of North Korea vs. Free Media, and how North Korea was able to censor Sony's release of the film, "The Interview." This project researches this phenomenon by conducting surveys. The movie created a debate between the two countries; Sony canceled its release in U.S. theaters. This project presentation will include video segments, and highlight President Obama's speech about North Korea's actions and Sony's decision.

Presenter(s)-Major: **Justin Pearce - Biological Sciences-Biology**
Title: EMPLOYING A NEW TECHNIQUE FOR MONITORING THE MOOSE POPULATION ON THE GRAND MESA
Department: Biological Sciences
Sponsor: Susan Longest

Abstract: The moose population on the Grand Mesa has been monitored for years by Colorado Parks and Wildlife. Occupancy surveys have been utilized to quantify the moose population and determine in which areas of the Mesa the moose are found. The purpose of this study is to test the ability of camera traps to be used as a tool for monitoring the moose population. This non-invasive technique will be compared to the results from occupancy surveys of the population. Tracking the moose with camera traps will help improve the Colorado Parks and Wildlife's ability to estimate population density, and potentially add to our understanding of moose foraging behavior, as well as their utilization of vegetation both for food and habitat.

Presenter(s)-Major: **Krista Petersen - Theatre Arts-Music Theatre**
Title: A PERFORMANCE OF "BEYOND MY WILDEST DREAMS" FROM KRISTA'S CABARET "A DREAM IS A WISH YOUR HEART MAKES"
Department: Theatre
Sponsor: Jeremy Franklin

Abstract: Under the working title of "A Dream Is A Wish Your Heart Makes," this full-length cabaret illustrates the journey of a college senior struggling to figure out what comes next. The cabaret is written and performed by Krista Petersen with piano accompaniment by Doug Morrow. The presenter will perform "Beyond My Wildest Dreams" by Alan Menken. The song and the dialogue demonstrate the inner struggles of graduating college. There are so many opportunities, but getting there is scary. The senior has a dream, but what happens if that dream falls through?

Presenter(s)-Major: **Melissa Peterson - Biological Sciences-Biology**
Title: EFFECTS OF CLIMATE CHANGE ON PREY AVAILABILITY AND REPRODUCTIVE SUCCESS OF MOUNTAIN BLUEBIRDS AND ASH-THROATED FLYCATCHERS IN WESTERN COLORADO
Department: Biological Sciences
Sponsor: Susan Longest

Abstract: With warming temperatures due to climate change, grasshoppers, a main staple of Mountain Bluebirds and Ash-throated Flycatchers, are hatching earlier in the year, causing their predators to similarly migrate earlier to match peak food resources for their fledglings. The purpose of this research was to study the effects on reproductive success of the aerial insectivores of Western Colorado due to climate change and the earlier hatching of their prey. Data on the fledging success of Mountain Bluebirds and Ash-throated Flycatchers in the Unaweep Canyon of Western Colorado were obtained for the past 15 years from NestWatch, an online database of nest records through the Cornell Lab of Ornithology. Data for insects were collected via collaborators in Colorado. These data were used to study the correlation between the species' arrival dates and insect abundance in relation to climate change. This study holds great significance as a study correlating early lay dates with climate change in Western Colorado, with the available information on grasshopper prey. Quantifying the effects of climate change in different habitats and elevations will be important in elucidating the variety of effects climate change has on different species and the interactions they have with their environment.

Presenter(s)-Major: **Amy Pettit - Nursing-AAS, Che Pimentel - Nursing-AAS, Caroline Roby-Blanchard - Nursing-AAS, Wendy Stickler - Nursing-AAS**
Title: PATIENT CENTERED CARE: PRESERVING PATIENT AUTONOMY IN END OF LIFE CARE
Department: Health Sciences
Sponsor: Genell Stites

Abstract: Recent advancements in medical treatment have changed the way that we care for the dying. In order to die in the 21st century, a decision must often be made to withhold treatment. All too often patients are not able to participate in these decisions because of sharp cognitive and physical declines. When the patient's condition has deteriorated to the point that they are unable to participate in the decision making process, family members and caregivers are left to grapple with difficult decisions. In an effort to provide patient centered care, measures must be taken to preserve patient autonomy. Data from recent research strongly supports the use of advance directives as a clinical guideline for planning end of life care. Research suggests that advance directives not only preserve patient autonomy but also reduce non-essential medical expenditures. The material presented here is based on research, theory and clinical experience and will detail interventions and implementation strategies for effective end of life planning and promotion of patient autonomy.

Presenter(s)-Major: **Tyler Pollock - Exercise Science**
Title: THE EFFECT OF SQUAT DEPTH ON MUSCLE ACTIVATION AMPLITUDE IN THE RECTUS FEMORIS, BICEPS FEMORIS, AND GLUTEUS MAXIMUS
Department: Kinesiology
Sponsor: Brent Alumbaugh

Abstract: The objectives were to observe if increased squat depth would increase muscular activity in the rectus femoris, biceps femoris, and gluteus maximus and which muscle at a given depth had the greatest activation during a squat exercise. It was hypothesized that, as depth increased, activation in all three muscles would increase with the greatest increase seen in the gluteus maximus. Methods: Three subjects completed two sets of one repetition at three depths and 75% of their one-rep maximum weight. The squats performed were a half, parallel, and full squat with knee extension angles of 80°-100°, 60°-70°, and 40°-45°, respectively. Electromyography data were recorded and relative max percentages were determined for each depth. Results: As depth increased, activation in the rectus and biceps femoris increased significantly in subjects one and three ($p < 0.001$) but decreased in subject two. There was no significant difference in the activation between the biceps femoris at the half and full depths ($p = 0.083$) and in the gluteus maximus at the parallel and full depths for subject two ($p = 0.295$). Conclusion: Increasing squat depth increases activation in the rectus and biceps femoris, with the greatest activations seen in the rectus femoris.

Presenter(s)-Major: **Madison Porter - English-Writing**
Title: RECESS IN SCHOOLS. IS IT IMPORTANT?
Department: Teacher Education
Sponsor: Jennifer Daniels

Abstract: The focus will be on elementary schools that have taken away recess, those who continue to use it, and the benefits and downsides of both. There will also be a minor focus on alternative options for those schools that no longer have recess. With the research that has been done, there is a belief that recess benefits students more than it hinders them. Despite the benefits, some schools take away recess for the purpose of giving teachers more time in the classroom in order to improve standardized test scores. Studies show that children need time out of the classroom to work on social skills, recharge their bodies and minds, and give them a chance to release pent-up energy. The interviews conducted will show opinions of current elementary school teachers, middle school teachers, and retired teachers. Recess and its importance will be evaluated through the research of schools in the United States and schools in other countries, as well as interviews of teachers, some of whom have young children themselves.

Presenter(s)-Major: **Colton Pratt - Theatre Arts-Acting/Directing**
Title: A PERFORMANCE OF "CONFRONTATION" FROM COLTON'S CABARET: "THE SHADOW OF HIM AND (THE TRAGEDY AND SELF-DESTRUCTION OF MEN)."
Department: Theatre
Sponsor: Jeremy Franklin

Abstract: The "Shadow of Him and (The Tragedy and Self-Destruction of Men)" is a full-length cabaret written and performed by Colton Pratt with musical accompaniment by Douglas Morrow. The presenter will perform "Confrontation" from *Jekyll and Hyde* by Frank Wildhorn. The entire cabaret focuses on the relationship of father and son, and the seemingly unbreakable path that fathers lay out for their sons. It also explores the tragic existence of some men and how they destroy their lives through their own actions. Although the cabaret is semi-fictionalized, it draws many autobiographical references from the performer's life.

Presenter(s)-Major: **Alexandra Price - Geosciences-Geology**
Title: TOOLSTONE LITHOLOGIES: SILICA CEMENTATION AND THE DIAGENESIS OF SEDIMENTARY UNITS IN THE UPPER TRIASSIC AND THE LOWER CRETACEOUS DOMINGUEZ-ESCALANTE NATIONAL CONSERVATION AREA, WESTERN COLORADO
Department: Physical & Environmental Sciences
Sponsor: Verner Johnson and Rick Livaccari

Abstract: This thesis investigates the lithological compositions of ancient quarry sites within the Dominguez-Escalante National Conservation Area (D-E NCA) in western Colorado. Scientific grants and geospatial data were supplied by the Grand Junction Field Office (GJFO) Bureau of Land Management (BLM). Early geographical applications concluded the ten ancient quarry sites in the D-E NCA were limited to the deposition and/or lithification of the Lower Cretaceous Burro Canyon and Dakota Formations. Several varieties of knappable stone were found, not limited to quartz arenite, chalcedony, lithic arenite and silicified siltstones. Identifiable lithic samples were taken back to Colorado Mesa University (CMU) lab for analysis: macroscopic, petrographic, thin section and x-ray fluorescence. Comprehensive understanding of diagenesis of siliclastic sediments in the Burro Canyon and Dakota Formations of the D-E NCA was then attempted. Understanding the origin and composition of lithics toolstones of ancient peoples can help archaeologists further understand sourcing (provenance), nomadic traditions, trading routes, as well as other quantitative and qualitative properties. With the implementation of no collection strategies, it is difficult to correctly identify toolstones in the field. By setting a preliminary set of differentiating characteristics, overall regional compartmentalization and classification, as well as good geological understanding of the region, knappable lithics can be quickly and correctly identified in the field. Geoarchaeological studies such as these allow field collection methods to be more precise, accurate, and effective.

Presenter(s)-Major: **Andrew Quesenberry - Computer Science**
Title: FIRESTORM ENGINE
Department: Computer Science, Mathematics & Statistics
Sponsor: Karl Castleton

Abstract: Programmers use many tools and libraries in their trade, and among game developers, the most ubiquitous is the Game Engine. Developers that don't have the time or budget to write their own technology have gravitated toward two major engines in the last two years: Unity 3D and Unreal Engine 4. These two engines provide a complete and generic framework for creating virtually any kind of game. While we do create a basic game in the Video Game Design class, the final product only qualifies as an "engine" in the most basic of terms. For the most part, only a few values are read in at runtime, and most of the game design must take place before the engine is compiled. The motivation for this project is to implement a more complete game engine that could be used to make several kinds of games. It would be far beyond scope to write every single engine system. There are three primary things I'm creating myself, a 3D Renderer, a scene system, and a Component-Entity system. The rest of the code will be taking existing libraries and getting them to work with the three systems I created. I have a brief presentation on my research on Unity3D and Unreal Engine 4, and two deliverables: a working copy of my game, and a working copy of my editor. The game will be simple, demonstrating each implemented system. The editor will demonstrate being able to design elements such as game screens and levels without recompiling the engine.

Presenter(s)-Major: **Adriana Ramos-Gonzalez - Chemistry**
Title: AN EXPLORATION OF APOPTOTIC RESISTANCE PATHWAYS IN AN INVASIVE BREAST CANCER MODEL
Department: Biological Sciences
Sponsor: Kelly Jean Craig

External Funding Source: Saccomanno Higher Education Foundation grant—Biomedical Research Internship Program

Abstract: Breast cancer is the second leading cause of death in American women. By understanding mitochondrial control of apoptosis, we can learn how breast cells become altered to promote survival and increased proliferation in cancer. Mitochondrial dynamics regulates these processes through fission and fusion of the mitochondria. We confirmed the human breast cancer cell line (HTB-22), displayed a pro-fission phenotype consistent with early apoptosis, but did not complete the intrinsic apoptotic pathway. HTB-22 cells had significantly shorter mitochondria when compared to the HTB-125 cells, the non-tumorigenic control. After apoptotic induction of both cell lines with the drug, staurosporine (STS), the HTB-22 cells had significantly shorter mitochondria in both the untreated and STS-treated comparisons to the control. To further support this observation of apoptotic resistance, the HTB-22 cells also had less apoptotic nuclei than the control in untreated conditions. Translocation of mitochondrial-localized proteins to the cytoplasm is another indicator of mid-apoptotic events occurring. We observed more mitochondrial-localized cytochrome c, a key pro-apoptosis signaling protein, in the HTB-22 cells than in the controls. Together these data show apoptotic resistance in the breast cancer cells when compared to the control, which we hypothesize, influences survival mechanisms that occur in cancer.

Presenter(s)-Major: **Jason Rhea - English-Writing**
Title: THE SHORT STORY
Department: Languages, Literature & Mass Communication
Sponsor: Randy Phillis

Abstract: This presentation of one or two original short stories will answer the following question: Are reality TV, ads, and memes capable of portraying what it's really like to be alive in the modern world? Meaning—and so language—is at the root of all thoughts and contains all of human understanding in a meta-satisfying paradox of questions and justifications. This paradox is what has always driven art and in turn criticism, scholarship, and growth. Ideally, this work hopes to provide a unique presentation of individual meanings with dynamic elements aimed at understanding and emotive response from different perspectives, through clear and effective communication and imagery. Everyone is capable of artistic expression and modern life is something that needs to be discussed.

Presenter(s)-Major: **Jasmine Ross - Liberal Arts-Elementary Teaching**
Title: ASSESSMENT PROCESS, AND ANALYSIS LEARNING STUDY
Department: Teacher Education
Sponsor: Cynthia Chovich

Abstract: A fourth grade student was selected, analyzed, and given assessments to monitor and guide instruction by a pre-service teacher. The student was given a variety of assessments from progress monitoring, ongoing formative assessments, and summative assessment techniques. This study was designed to allow a student teacher candidate to explore and test theories she has learned from instruction in the education program in a field-based setting. Assessment Process and Analysis Learning Study (APPALS) is an ongoing study that allows for pre-service teachers to analyze and implement assessments using designing tools, collecting artifacts, analyzing student work, and to begin to make instructional decisions of the next steps appropriate to that student. Ultimately there are two goals for this study: 1) to analyze the students progress using the assessments as artifacts to explain the students growth, and 2) to demonstrate the student teacher's professional growth. The study itself demonstrates the importance of assessments and the role they play in education for both for educators and students.

Presenter(s)-Major: **Tiffany Rubalcaba - Biological Sciences-Biology**
Title: EFFECTS OF CLIMATE CHANGE ON THE REPRODUCTIVE SUCCESS OF DIFFERENT TYPES OF BIRD SPECIES ALONG UNAWEEP CANYON
Department: Biological Sciences
Sponsor: Susan Longest

Abstract: Climate change has been shown to affect the timing of breeding seasons in many bird species. Since 1999, several species of birds have utilized nest boxes along the Unaweep Canyon Mountain Bluebird Trail. This study investigated the reproductive success of different bird species nesting along this trail during the last 15 years in relation to climate change by analyzing data from NestWatch, an online database of nest records through the Cornell Lab of Ornithology. Species using the nest boxes included Mountain Bluebirds, Ash-throated Flycatchers, Western Bluebirds, and Mountain Chickadees. These results will help us understand the effects of climate change on different species and determine which life-history traits may enable certain species to respond better to climate change.

Presenter(s)-Major: **Scott Rust - Accounting-Public Accounting**
Title: INCREASING THE EFFICIENCY AND UTILIZATION OF TELTECH COMMUNICATIONS' TELECOMMUNICATION CABINET DEMANUFACTURING PROCESS
Department: Business
Sponsor: Donald Carpenter

Abstract: Teltech Communications is an established telecommunications, multi-service provider. This organization specializes in managing telecommunications assets and specifically, demanufacturing those assets at the end of their life-cycle. This researcher utilized this prospective client and its' process of demanufacturing telecommunication cabinets as the basis for the research practicum project. The issue with the prospective client's process will be stated along with brief answers to each research question. Also, a short literature review and the approaches and methodologies which were used during the project will be discussed.

Presenter(s)-Major: **Colton Schoelkopf - Mathematics-Statistics**
Title: USING LINEAR REGRESSION TO DETERMINE WHAT WINS BASEBALL GAMES
Department: Computer Science, Mathematics & Statistics
Sponsor: Darren Gemoets

Abstract: Hot dogs, beer, summer, and friends – all things you think of when you think of going to a baseball game. And of course everyone likes to see their team win when they go out to the ballpark. Some fans love to see a slugfest of a game with lots of home runs and offensive action. Others may want to see a pitching dual with two pitchers going back and forth with solid defense. Even more than the fans is that baseball is a billion dollar industry. Fantasy baseball is also expanding. So the big question is which one of those offense, or pitching and defense, win games more on average. This poster presents the use of linear regression to determine which of the categories will tell if a team should win or not. By modeling the box-scores (baseball data) and comparing them to the win percent it's possible to get a model that represents such a question and will tell if your team should win on a given day. There are many box-scores for pitching, defense, and offense that have been found significant that will be used to determine what will correlate to a team winning more on average.

Presenter(s)-Major: **Jill Schoeppner - English-Literature**
Title: LANGUAGE ACQUISITION MILESTONES
Department: Languages, Literature & Mass Communication
Sponsor: Maureen Neal

Abstract: This study of language acquisition was conducted by research that supplemented in home experience with learning from the classroom. A theory written by Eric H. Lenneberg outlines the steps he believed children take when acquiring language. These steps start with crying, cooing, babbling, and progress to one and two word sentences, and end with a vocabulary of over 1,000 words where language is then well-established. With a rare opportunity to compare this theory with the author's son's own language acquisition, who fell within the babbling stage at that time, original data was collected. She began writing down all words and sounds that he made, and breaking them down using the phonetic alphabet and the language of phonology. The author found that even though her son, Ezzra, was born prematurely, he still fit perfectly into Lenneberg's theory and even excelled in certain steps. This project will demonstrate the accuracy of Lenneberg's language acquisition theory with evidence from Ezzra's speech patterns that fit into the 18 month theoretical sequence.

Presenter(s)-Major: **Millie Schreibman - Theatre Arts-Music Theatre**
Title: A PERFORMANCE OF "STAY WITH ME" & "EDELWEISS" FROM MILLIE'S CABARET: "CROSS-EXAMINATION"
Department: Theatre
Sponsor: Jeremy Franklin

Abstract: The presenter will perform "Stay With Me" by Stephen Sondheim and "Edelweiss" by Richard Rodgers. The selections focus on the difficulties and joys of raising a daughter, and how a daughter's growth is affected by the obstacles parents face. The subject is approached from both the Contemporary and Golden Age of musical theatre, while allowing for a fatherly perspective on daughters through real cross-examinations of fathers. "Cross-examination" is a full length autobiographical cabaret written and performed by Millie Schreibman with piano accompaniment by Doug Morrow.

Presenter(s)-Major: **Andrew Seibert - Physics**
Title: GAS ADSORPTION ON ZEOLITE
Department: Physical & Environmental Sciences
Sponsor: Bill Tiernan

Abstract: Adsorption is the adhesion of gas molecules onto a surface due to Van Der Waal forces. Gas adsorption of helium and air on zeolite was studied to obtain the percentage of gases adsorbed on zeolite using pressure swing adsorption. This was accomplished by measuring the pressure swing when an empty chamber was opened to the zeolite chamber at a different pressure. Data was taken at selected pressures between 0 and 900 Torr. These measurements allow determination of zeolite surface area and the binding energy of gas molecules to zeolite. Zeolite is a very porous material which create a large internal surface area. One study of gas adsorption of zeolite found that this internal surface area was around 600 m².

Presenter(s)-Major: **Danielle Sloan - Liberal Arts-Elementary Teaching**
Title: PRE AND POST ASSESSMENT ANALYSIS
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: A teacher education intern at Colorado Mesa University performed a research study to assess the amount of growth students made from a pre-assessment to the post assessment in relation to the learning targets. Through analyzing the data the intern was able to see what areas, in reference to learning targets, that the students grew most in; however, it also allowed the intern to see what areas students still need support in to grow further. Using this information helps to better prepare future units and allows the intern to see the effectiveness of the unit based on growth from the pre-assessment to the post assessment. This presentation is intended for anyone that is interested in analyzing student growth throughout a science, math, and writing unit. Overall, the research allows the intern to use information to improve student learning based on each content growth results.

Presenter(s)-Major: **Carson Snart - Computer Science**
Title: MODELING HUMAN PASSWORD SELECTION
Department: Computer Science, Mathematics & Statistics
Sponsor: Warren MacEvoy

Abstract: Passwords have become rather ubiquitous in today's society. We use them to gain access to our computers, email, websites, and many more places. A natural question that follows (for good or for bad) is: "How do people choose passwords?" Using a combination of information theory, programming, and probability theory, this poster explains how one might go about answering that question. The poster presents a model for how people would choose passwords in a simplified language. This information can then be applied to the more general 'password' language, which would have implications in computer security.

Presenter(s)-Major: **Thomas Spain - Geology**
Title: STRATIGRAPHIC FRAMEWORK AND K/T BOUNDARY CORRELATION OF THE OHIO CREEK CONGLOMERATE, PICEANCE BASIN, MESA, COLORADO
Department: Physical & Environmental Sciences
Sponsor: Andres Aslan

Abstract: The Ohio Creek Conglomerate has been the subject of much confusion due to its proximity to the K/T boundary. Previous work including palynomorph data has placed the Ohio Creek Conglomerate on both sides of the K/T boundary. Revived efforts to characterize the hydrocarbon reservoir within the Mesaverde Group have renewed interest in the age and stratigraphic relations of the Ohio Creek Conglomerate. Measured sections, pebble counts and paleocurrent data for the Ohio Creek Conglomerate near Mesa, Colorado will provide insight into the lateral and vertical variations within the unit and its stratigraphic relationships with respect to older Mesaverde Group and younger Wasatch Fm. deposits. Understanding the stratigraphic relationship of the Ohio Creek Conglomerate can provide source distribution and reservoir characterization to units across the K/T boundary within the Piceance Basin.

Presenter(s)-Major: **John Spriggs - Art-Studio Art**
Title: RAM ON LEAF
Department: Art
Sponsor: Steven Bradley

Abstract: The piece, "Ram on Leaf" is the artist's personal depiction of nature. The artist chose the most raw form of canvas he could think of, an oak leaf, that would cooperate with the artist's preferred medium, ink, to bring the piece closer to nature. The selection of the Big Horn Sheep was a fairly simple one. 2015 is the year of the sheep, and the artist loved this concept of using the creature as a subject as well, because it is native to the artist's home of Colorado. The artist hopes the viewer enjoys viewing this piece as much as the artist enjoyed creating it.

Presenter(s)-Major: **Tiffany Story - Liberal Arts-Elementary Teaching**
Title: ASSESSMENT PROCESS, PRACTICE AND ANALYSIS LEARNING STUDY
Department: Teacher Education
Sponsor: Cynthia Chovich

Abstract: This research focuses on the assessment data that guides teaching in the classroom. The data follows one fifth grade student's growth through instructional assessments of both formal and informal assessments. The research will use assessments that are both established and innovated in technique, such as Six Trait Writing, Words Their Way Inventory, Running Records

and Rigby Reads Benchmark. The measurements of the student's growth are taken from their reading ability, writing data, and observation during a three month evaluation of the students' progress. Through this evaluation the research will identify the best foundation for monitoring the student and what the next steps are in the instructional planning to better assist the student in their learning career. Accompanied by providing a pre-service teacher the opportunity to observe the purpose of administering assessments and develop on-going techniques for their future teaching career.

Presenter(s)-Major: **Leah Temple - Biological Sciences-Biology**
Title: HOT SUMMERS & FAST CATERpillARS: THE EFFECT OF ELEVATION ON THE DEVELOPMENT RATE OF HERBIVOROUS INSECTS
Department: Biological Sciences
Sponsor: Thomas Walla

External Funding Source: Saccomanno Higher Education Foundation grant – Biomedical Research Internship Program

Abstract: Insect development rate is influenced by the rate of chemical reactions during metabolism, which depends on ambient temperature. Preliminary data indicates lepidopteran larval development in the tropics may be significantly faster at sea level than at high elevation. How much of the difference in development rate is "hardwired" species-specific genetics and how much is due to physiological acclimation is poorly understood. This work measured the potential for larvae to increase development rates in response to warmer climates, and if development patterns may be influenced by the stage of development in which organisms are exposed to environmental stimuli. *Eois* (Geometridae) caterpillars were collected from six different life stages ranging from egg to fifth instar at 2100m in the Ecuadorian rain forest. This elevation has an average daytime temperature of 16°C. Half of the larvae were raised on their host plant at this elevation as a control group, while the remaining larvae were raised at an elevation of 1100m, which has an average daytime temperature of 21°C. The results showed caterpillars raised at the lower elevation developed faster at all instar stages. Using data previously collected from caterpillars raised at 100m (26°C) in Costa Rica, I interpolated the relationship between temperature and development time using a simple linear model. Larvae reared at 1100m in Ecuador developed at a rate consistent with the predictions of the model, supporting temperature as a sufficient predictor of development rate. This investigation provides insight into how the structure of trophic interactions will change in the face of changing climate.

Presenter(s)-Major: **Nicole Thornton - Liberal Arts-Elementary Teaching**
Title: READING AND MATHEMATICS CASE STUDY
Department: Teacher Education
Sponsor: Lisa Friel

Abstract: The focus of this project is the mathematical and reading growth in 5th grade students between their pre-assessment and their post-assessment. Assessments are a way to take a snap-shot view into the learner's development and where further instruction and growth is needed and this view into the students learning needs to be continued throughout so that the teacher is able to better assess the growth and development of each student. The motivation was to look at how the instruction strategies and variation could influence the growth of students' academic abilities within a specified content. After the time for each of the units was finished, a summative assessment was given to assess how much of the information the student has grasped. The result of this project will be a comparison of 18 students at the beginning of a unit and where the same 18 are at by the end of the unit.

Presenter(s)-Major: **Adam Trumbo - Geology**
Title: GEOCHEMICAL CHARACTERIZATION OF MINERALIZATION IN UNAWEEP CANYON CATACLASTIC ZONES
Department: Physical & Environmental Sciences
Sponsor: Verner Johnson

Abstract: The Uncompahgre Plateau contains multiple cataclastic zones that have been mineralized by hydrothermal and supergene waters. The Pinon Mesa cataclastic zone was studied by CMU students in correlation with a magnetic anomaly found in the area. A second cataclastic zone was found in eastern Unaweep Canyon in the vicinity of a second magnetic anomaly indicated by the 1980 NURE aerial magnetic maps and mapped by additional CMU students. Multiple samples were retrieved from mineralized zones and stratigraphic layers surrounding the cataclastic zones. The samples were analyzed for elemental concentrations using wavelength dispersive X-ray fluorescence techniques. Data from this analysis was correlated to determine the most likely source of elemental constituents within the mineral matrix. In addition to the initial analysis, a second analysis focusing on rare earth element (REE) concentration was performed for correlation with igneous intrusive bodies in the canyon stratigraphy. The purpose of this study is to categorize the minerals, characterize the substituents and determine the source of the chemical constituents.

Presenter(s)-Major: **Sarah Tyler - English-Writing**
Title: SITUATING A TEXT: A POLITICAL CARTOON BY TONY AUTH
Department: Languages, Literature & Mass Communication
Sponsor: Barry Laga

Abstract: "Situating a Text: A Political Cartoon by Tony Auth" is a presentation about literature and context which resulted from the CMU course Introduction to Literary Theory and Criticism. In 2005, Pulitzer Prize winner and editorial cartoonist, Tony Auth published a political cartoon informally titled, "Philly Zoo Elephant," which criticized the living conditions of elephants in zoos. In his textbook *An Introduction to Literature, Criticism and Theory*, Andrew Bennett proposes that literary texts "are embedded within the social and economic circumstances in which they are produced and consumed." In other words, Bennett's theory of New Historicism suggests the impact literature can have is most influential when situated within a certain historical context. What is the historical context of Auth's political cartoon? Zoos were first established in 1748 as private exhibits for the aristocracy. Since then, public zoos have grown in quality and quantity. Yet, despite this popularity, zoos are often at the heart of a debate over ethics and animal cruelty. Using Bennett's theory of New Historicism, this presentation analyzes Auth's cartoon and other related texts that operate within the context of the ongoing zoo debate which addresses the question: should animals be kept in zoos?

Presenter(s)-Major: **Maria-Elisa Uribe - Art-K-12 Teaching**
Title: TEACHING AS A PROFESSION
Department: Teacher Education
Sponsor: Jennifer Daniels

Abstract: The presenter will discuss investigations about the profession of teaching. The presentation will explore effective methods of teaching, the view of teaching as a job versus a calling, and why teaching is a desirable career option.

Presenter(s)-Major: **Mariah Weinke - Biological Sciences-Biology**
Title: USING DNA SEQUENCE DATA TO INTERPRET HISTORY: THE DISPERSAL OF *Solanum* SECT. *Torva*
Department: Biological Sciences
Sponsor: Stephen Stern

Abstract: There are approximately 1400 species in the plant genus *Solanum*. The most well-known species are important food crops consumed around the world including potatoes (*Solanum tuberosum*), tomatoes (*Solanum lycopersicum*), and eggplants (*Solanum melongena*). Using DNA sequence data from several genetic markers, phylogenies were developed to investigate the evolutionary relationships between some Old World and New World species of *Solanum*. Specifically, the project examines a new theory in the dispersal pattern of *Solanum* sect. *Torva*. With this information, we have revealed new insight into the history and distribution of this group.

Presenter(s)-Major: **Brian Williams - Political Science**
Title: GLOBAL GOVERNANCE OR GLOBAL GOVERNMENT? IMPLICATIONS OF THE HISTORICAL EVOLUTION OF STATE SOVEREIGNTY
Department: Social & Behavioral Sciences
Sponsor: Bill Flanik

Abstract: The globalization of technology has interconnected the human family as never before, improving commerce, communication, and logistics. Yet there is a darker side to globalization: climate change, cybercrime, and 'rogue' multi-national corporations escaping national regulation. These "trans-sovereign" challenges cannot be managed by the traditional sovereign state. What, then, will become of state sovereignty in the coming millennium? Will the United Nations (UN) evolve into a powerful world government, eclipsing national sovereignty? Or will states continue to play a key role via global governance—that is, networks of states, international and regional organizations, and trans-national actors? This question is explored by examining the historical consolidation of sovereignty in four political entities: the United States, Australia, Germany, and the European Union. The case studies have common themes that shed light on the conditions required for a UN-led global government. The results suggest that while world government may be an economic imperative, the identity congruence among stakeholders is too low to effect a complete transfer of power to a world government. Thus, it is projected that while the UN will become more powerful, sovereignty will remain dispersed between it, states, and trans-national actors in a global governance network.

Presenter(s)-Major: **Mary Young - Biological Sciences-Biology**
Title: CLIMATE CHANGE EFFECTS ON REPRODUCTIVE SUCCESS OF MOUNTAIN BLUEBIRDS IN WESTERN COLORADO
Department: Biological Sciences
Sponsor: Susan Longest

Abstract: Climate change has been a growing topic since the 1980s. Studies have suggested that hatching dates in bird populations are moving earlier in the season to match food availability. This project focuses on the effects of latitude on the reproductive success of Mountain Bluebird populations. Data were compared across 15 years for two populations in Colorado and Oregon based on nest box observations submitted to NestWatch, an online database of nest records operated by the Cornell Lab of Ornithology. This study tested the prediction that the populations at the southern latitudes will have earlier hatching dates than those of the northern latitudes based on warmer temperatures. These results will provide more information on the reproductive success of Mountain Bluebirds throughout their range and how they may differ in response to climate change.

Presenter(s)-Major: **Ryan Zentmeyer - Business Administration-Finance**
Title: PORTFOLIO MANAGEMENT TOOLS: A LITTLE HELP FROM EXCEL
Department: Business
Sponsor: Matt Rosenberg

Abstract: Modern portfolio theory assumes that investors make rational decisions. Certainly, investors, and even portfolio managers, can often make decisions based on a whim or gut feeling, not on rationality. This project is an Excel application designed to quantify the risks and returns of a portfolio, giving investors efficient tools to optimize their portfolio. This semi-automatic application also provides investors with graphical analysis to aid them in rational portfolio management to reach their investment goals.

Presenter(s)-Major: **Alexis Zumwalt - Liberal Arts-Elementary Teaching**
Title: APPALS: ASSESSMENTS
Department: Teacher Education
Sponsor: Cynthia Chovich

Abstract: As a future educator, meeting the diverse needs of students has become a priority. To ensure that each student is prepared for the real world, academic assessments need to be aligned with their areas of need, while using their strengths to identify their developmental and academic proficiency. The primary goal of this project is to prove the importance of assessing students' current needs as well as highlighting their strengths to promote their willingness to learn and further improve. Educators are held responsible for the future and success of current generations. Therefore, fellow educators and parents/guardians of the students need to be aware and determined to use assessments to better the student(s) by addressing their areas of needs.



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