PROGRAM AND PROCEEDINGS

SYMPOSIUM ON UNIVERSITY RESEARCH AND CREATIVE EXPRESSION

16TH ANNUAL CONFERENCE

CENTRAL WASHINGTON UNIVERSITY
ELLENSBURG, WASHINGTON

MAY 19, 2011

STUDENT UNION AND RECREATION CENTER

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A special thank you to SOURCE sponsors and committee members, Roger and Deborah Fouts. They are long-term supporters of SOURCE and academic excellence at CWU. We hope their next adventures are full of laughter and revelry!
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HISTORY AND GOALS OF THE SYMPOSIUM

Showcasing the quality and quantity of undergraduate research conducted at Central Washington University dates back to 1996 and the first Undergraduate Research Symposium, which provided the initial framework for presenting faculty-mentored undergraduate student research. The undergraduate symposium quickly expanded to include other student scholarly activity and, in 1998, the broader scope was reflected in a new name: the Symposium on Undergraduate Research and Creative Expression. In 2002, the Conference of Graduate Student and Faculty Scholarship was initiated. Three years after that, the conferences merged to create the Symposium on University Research and Creative Expression (SOURCE), which sought to build upon the solid foundations laid by those previous events.

The intent of SOURCE, which celebrates its sixth anniversary this year, is to provide students, faculty, and staff from all departments and units with a platform to present their individual or collaborative scholarly work, while providing a forum for sharing and celebrating that scholarship with the university and broader community. A variety and expanding number of presentation forms are seen at SOURCE, including oral and poster presentations, artwork, and performances, to name a few.

SOURCE fosters innovative scholarship as a way of learning and life, and strives to:

1. Enhance and promote scholarship based on the discovery, creativity, and inquiry, and the entrepreneurial talents of CWU students, faculty, and staff;
2. Commend the diligence and commitment of mentors from secondary and post-secondary educational institutions and industry;
3. Cultivate the next generation of research mentors and professionals; and
4. Enhance local, regional, and global engagement by building partnerships, which unite higher education, industry, and government.

In 1996, the original Undergraduate Research Symposium had twenty-three presentations. This year, more than 580 individuals are scheduled to present approximately 150 oral presentations, 138 poster presentations—including eleven at satellite campuses, eighteen creative expression presentations, nine business plans, the single reed musical performance evening, and a fashion show. Forty-four academic and student life programs are participating at SOURCE this year: Anthropology and Museum Studies; Art; Biological Sciences; Bridges to Baccalaureate Program; Career Services; Center for Excellence in Science and Mathematics Education; Chemistry; Chimpanzee and Human Communication Institute; Communication; Computer Science; Dance; Douglas Honors College; Economics; Education; English; Facilities Planning and Construction; Family and Consumer Sciences; Film and Video Studies; Finance and Operations and Supply Chain Management; Geography; Geological Sciences; Health; History; Industrial and Engineering Technology; Information Technology and Administrative Management; Law and Justice; Management; Mathematics; McNair Scholars Program; Music; Music Education; Nutrition, Exercise and Health Services; Philosophy; Physics; Political Science; Primate Behavior; Psychology; Recreation Tourism; Resource Management; Science Education; Science Honors Research Program; Science Talent Expansion Program; Sociology; and Theatre Arts.

SOURCE continues to welcome additional growth in numbers of presenters and participants, as well as an expanded roster of participating colleges, departments, and programs. SOURCE’s vision remains one of creating an event that showcases the depth and breadth of CWU scholarly work, and sharing those endeavors with the campuses and communities served by the university.
STUDENT FASHION SHOW

The CWU Fashion Merchandising program is proud to present the 15th annual spring fashion show, REVOLUTION. Come and see a show where the clothing and the atmosphere are a Revolutionary experience for all. Featuring the latest trends and original student designs, the show is produced by the FCSA 181 Fashion Show Production class and the original designs are from students taking FCSA 488 Fashion Line Development.

BUSINESS PLAN COMPETITION

This year marks the first SOURCE business plan competition. This competition is in coordination with the Extreme Entrepreneurship Tour Event held in February, 2011. Awards are generously sponsored by the Herbert B. Jones Foundation. Nine students are finalists in the competition.

DIGITAL VISUALIZATION LAB

The Science Phase II pre-design committee recently proposed a building design that includes a Digital Visualization Laboratory (DVL), a facility that goes well beyond a traditional planetarium and can accommodate instructional or scholarly projects from engineering through graphic arts. A portable version of the facility will be on campus, Thursday, May 19, during SOURCE. The structure will be set up in the SURC’s north-most basketball court. Please check the DVL information table in the SURC Ballroom for spaces which may become available throughout the day to view a demonstration.

PROGRAM COVER DESIGN

This year’s SOURCE program cover was designed by graphic design undergraduate student Jennifer Cooley under the mentorship of professor Glen Bach.

PROGRAM PHOTOGRAPHY

Undergraduate student, Amanda Umberger, is the official SOURCE photographer. She has volunteered her time since 2008. She is a double major seeking a BFA in Fine Art, Photography and a BS in Information Technology & Administrative Management, Web Design.

Students of the spring quarter RMT467, Retail Technology Management class also volunteered their time to photograph SOURCE 2010 participants. Central staff Valerie Chapman-Stockwell and Rich Villacres contributed additional photographs.

SINGLE REED NIGHT

The Music Department’s single reed studio presents an evening of music featuring outstanding solo and ensemble performances from saxophone and clarinet students. The performances will be held in Music Building Recital Hall at 7 p.m. Due to limited space, participation is limited to invited participants.
PRESIDENT’S WELCOME

May 19, 2011

I would like to extend my personal welcome, and that of all members of the Central Washington University administration, to the university’s sixteenth annual Symposium on University Research and Creative Expression. SOURCE is the university’s largest, multi-disciplinary event. It offers us a yearly opportunity to celebrate the tremendous quality and quantity of research and creative achievements produced by our undergraduate and graduate students, faculty, staff, alumni and other members of the university community.

Back in 1996, the first SOURCE was held. It recognized the work of twenty-three undergraduate students, along with their faculty mentors. By way of comparison, last year’s SOURCE was the largest ever with 304 presentations by 462 individuals. It also showed the greatest diversity of scholarly achievement yet, representing the intellectual and creative activities of twenty-six different academic programs.

Today, you are participating in the next chapter in the growth and evolution of SOURCE, which is expected to again set records for the numbers and types of presentations.

While SOURCE highlights the academic vitality of Central, it is a team of dedicated university personnel who, beginning fall quarter each year, work behind the scenes, putting the pieces in place for the spring symposium. I was pleased when the organizing committee recently received the 2010 Team of Distinction award from the university’s Civil Service Employee Council in recognition of “those who have combined their energy to achieve great results on behalf of CWU.”

It is through the work of this year’s committee, chaired by Dr. Natalie Lupton, CWU professor of Information Technology and Administrative Management, that SOURCE continues to be considered a “model of inclusiveness” as it “encourages and rewards innovative and entrepreneurial discovery, fosters faculty/staff-student relationships, and contributes to whole student development.”

SOURCE also would not be possible without key contributions from administrators, faculty and staff members, and other volunteers who offer their valuable time and expertise to serve as session judges and chairs, or the generous financial contributions of a variety of university academic and administrative units, individuals, and corporate sponsors.

Again, welcome to SOURCE. It is truly a community effort of which we can—and should—all be proud.

Sincerely,

James L. Gaudino, PhD
President
Each year, Manastash showcases creative work from the entire university student body. Manastash is housed in the English Department and has been published annually for over 40 years.

Manastash provides a forum for dialogue not only between students and the academic community, but between students and alumni, prospective students and the town of Ellensburg. The advisors and structural support for this activity function within the Writing Specialization program in the English Department. Katharine Whitcomb is the current coordinator for this program. Lisa Norris and Lee Honeycutt were the advisors this year for editing and production, respectively.

The goal of Manastash is to recognize the diverse student university community and to celebrate the achievements of that community through a quality publication. Manastash is distributed campus-wide and to the centers, and is a source of pride to a wide variety of CWU students.

Please join us at SOURCE for the Manastash Showcase, 10-11:20 a.m., featuring students whose work is published in this year’s issue! You are also invited to the Manastash Publication reading, exhibition, and party on Wednesday, June 1, 7:30 p.m. at Alley Cat Artists Gallery in Ellensburg.
# Program at a Glance

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<th>Session 4</th>
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<td>8:00-8:30</td>
<td>OPENING REMARKS</td>
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**Poster Session #1**
- Chemistry
- Mathematics
- Political Science
- Psychology
- Art

**Poster Session #2**
- Fashion Merchandising
- Geography
- Geological Sciences
- Physics
- STEP
- Resource Management
- WATERS Grant/Science

**Poster Session #3**
- Anthropology & Museum Studies
- Biological Sciences
- Industrial & Engineering Technology
- English
- Information Technology & Administrative Management
- Law & Justice
- Nutrition, Exercise, & Health Services
- Primate Behavior
ORAL PRESENTATION SCHEDULE

Only authors are listed for each paper/poster.
Mentors are shown in the ABSTRACT portion of this program.

SESSION 1:
ROOM: 135

8:30-8:50 HE ACTED SO QUEER
Shepard, Kailey

8:50-9:10 GEORGE E. STEPHENS AND JAMES H. GOODING: CIVIL WAR CORRESPONDENTS FROM THE 54TH MASSACHUSETTS
Smith, Nadine

9:10-9:30 THE SOCIAL AND ENVIRONMENTAL HISTORY OF HUI/HAN RELATIONS AND LAND CULTIVATION ON THE LIUPAN PLAIN
Bahr, Logan; Wardrop, Margaret; Cmejla, Ben; Smith, April

9:30-9:50 THE IMPACT OF THE GREAT WESTERN DEVELOPMENT STRATEGY ON NORTHWESTERN CHINA
Harrison, Isa; Houck, Meredith; Jiwani, Naushin; Welch, Jennie

SESSION 2:
ROOM: 137A

8:30-8:50 CAPE & THE COWL: VIGILANTISM IN POPULAR CULTURE AS AN INVERSE THEORY OF CIVIL DISOBEDIENCE
Candella, Jimmy-Dean

8:50-9:10 ESTABLISHING AND MANAGING AN UNDERGRADUATE WRITING JOURNAL: CENTRAL WASHINGTON REVIEW
Martinson, Matt; Gornik, Charles; Greene, Brian; Doug, Mitchell; Ruppert, Amy

9:10-9:30 INCORPORATING PHILOSOPHIES OF EDUCATION INTO FIRST-YEAR COMPOSITION CURRICULUM
Humphrey, Marisa

9:30-9:50 WRITER’S BLOCK—CREATING AN ONLINE LITERARY JOURNAL
Roddy, Rachel

SESSION 3:
ROOM: 137B

8:30-8:50 A COMPUTER MODEL OF THE VIBRATIONAL RESPONSE OF FLUID-FILLED SHELLS
Abdul-Wahid, Sami

8:50-9:10 THE FIRST 9 THZ LASER EMISSION GENERATED BY OPTICALLY PUMPED CH$_3^{18}$OH
Milne, Jason

9:10-9:30 EFFECT OF INTERNAL PRESSURE ON THE VIBRATIONAL FREQUENCY RESPONSE OF A FLUID-FILLED SPHERICAL SHELL
Taylor, Robert; Abdul-Wahid, Sami

9:30-9:50 BEE COLONY OPTIMIZATION OF PROTEIN FOLDING
Hepler, Kristoffer; Williamson, Forrest; Haberman, Zachery
SESSION 4:
ROOM: 140

8:30-8:50  THE ROLE OF NITRIC OXIDE IN EXPERIMENTAL HOOKWORM INFECTION  
Berndt, Amanda; McNutt, Sarah; Moesch, Stephanie

8:50-9:10  THE ROLE OF INTERLEUKIN-5 IN HOOKWORM INFECTION  
Moesch, Stephanie; Dondji, Blaise

9:10-9:30  EXPLORING THE UTILITY OF THE NUCLEAR XDH GENE FOR GYMNOSPERM PHYLOGENETICS  
Garcia, Erik; Peery, Rhiannon; Wilcox, Kevin

9:30-9:50  SEXY-SON OR HANDICAP: TESTING TWO MATE CHOICE HYPOTHESES OF SEXUAL SELECTION USING THE BLACK FIELD CRICKET, GRYLLUS FIRMUS  
Buxel-Florenzen, Stefanie; Sun, Lixing

SESSION 5:
ROOM: 201

8:30-8:50  CWU COMMUNITY BUYING BEHAVIOR: A COMPARATIVE STUDY  
Martin, Lindsay; Okamura, Emily; Sanders, Will; McCorkle, Matt

8:50-9:10  IMPROVING THE RELATIONSHIP BETWEEN ELLensburg LOCALS AND UNIVERSITY STUDENTS  
Gunning, Dylan; Burrel, Jenae; Staples, Karly; Stone, Jocelyn

9:10-9:30  AFTER HOUR NON-ALCOHOLIC HANG-OUT SPOT FOR AGES 18 TO 25 IN ELLensburg  
Morris, Rachael; Dymerski, Mikhael; Lukomski, Olivia; Mullen, AJ

9:30-9:50  COUTURE VS. DEPARTMENT STORE: A STUDENT’S BATTLE FOR FASHION  
Witham, Caitlin; Westendorf, Amy

SESSION 6:
ROOM: 202

8:30-8:50  BUILDING A HUMAN POWERED ELECTRICITY GENERATION SYSTEM  
Griffith, Garrett

8:50-9:10  WHAT’S CENTRAL FOR A BATTLE BOT?  
SPiry, Jonathan

9:10-9:30  FRONTEND LOADER VS. HYDRAULIC EXCAVATOR: BATTLE OF THE EARTHMOVERS  
Whelan, Michael; Plugge, P. Warren

9:30-9:50  ANALYSIS OF GREEN TECHNOLOGY IN UTILITY CONSTRUCTION  
Plugge, P. Warren
SESSION 7:
ROOM: 301

8:30-8:55  MAD DOG TEA  
Zapel, Timothy

8:55-9:20  A NEW TAKE ON THE CROSS TRAINING GYM  
Ehling, Justin

9:20-9:45  ECONTAINER HOMES LLC: ECOLOGICALLY FRIENDLY, LOW COST LIVING  
Huitron, Juan; Huitron, David

SESSION 8:
ROOM: Theatre

8:30-8:50  THE HORRORING  
Greer, Jacob; Drougett, Austin

8:50-9:10  THE WHITE ROOM - A SHORT FILM  
Larson, Kaitlin

9:10-9:30  THE RAKIST  
Bennett, Zachary; Rose, Kathryn; Kim, Paul; Devine, Crystal; Marshall, Joe; Lewis, Haley

9:30-9:50  THAT ALIEN KING IS MY BABBY DADDY  
Greer, Jacob

SESSION 9:
ROOM: 135

10:00-10:20  COOKING UP A NATION: FOOD, CULTURE, AND IDENTITY IN THE EARLY AMERICAN REPUBLIC  
Bailor, Karen

10:20-10:40  “A WORK OF NECESSITY” THE SABBATH MAIL CONTROVERSY OF 1809-1817  
Erickson, Amy

10:40-11:00  GOOD COUNTRY MUSIC FROM AMARILLO TO ABILENE: WEST TEXAS FOLKLORE AND THE CREATION OF MODERN COUNTRY MUSIC  
Holly, William

11:00-11:20  MILITARY BANDS IN THE CIVIL WAR: FACILITATING MORALE AND UNIT SOLIDARITY IN THE POTOMAC ARMY  
Schwoch, Kevin

SESSION 10:
ROOM: 137A

10:00-11:20  MANASTASH SHOWCASE  
Whitcomb, Katharine; Bayles, Loren; VanScyoc, Aaron; Byce, Caitlyn; Hovde, Leah; Ham, Preston
SESSION 11:
ROOM: 137B

10:00-10:20  IRON IN SOOT: REACTIONS IN THE TAIL PIPE
Casique, Hector

10:20-10:40  ELECTROPHILIC SUBSTITUTION OF AROMATICS WITH 2-PROPYN-1-OL USING IONIC LIQUIDS AS NON-TOXIC SOLVENTS
Kellar, Casey

10:40-11:00  QUANTITATIVE LITERACY THROUGH SCIENTIFIC ARGUMENTATION: A GENERAL CHEMISTRY SPECTROSCOPY LAB
Helland, Terry; Donaldson, Josh; Gutierrez, Clara; Peterson, Brandon; Aichele, Cheri

11:00-11:20  A SURVEY OF THE CHEMICAL CONTENT AND MEDICINAL ACTIVITY OF SHRUB-STEPPE PLANTS OF THE PACIFIC NORTHWEST
John, Aaron

SESSION 12:
ROOM: 140

10:00-10:20  SUMMARY OF SONGBIRD BANDING DATA AND THE ECOLOGY OF A RARE HABITAT IN SONORA, MEXICO
Hannuksela, Adam

10:20-10:40  HABITAT SELECTION OF NORTHERN ALLIGATOR LIZARDS NEAR A PROPOSED WILDLIFE CROSSING BRIDGE AT I-90
Meidell, James; Beck, Daniel; Garvey-Darda, Patty

10:40-11:00  ALTITUDINAL VARIATION OF THE PACIFIC CHORUS FROG, PSEUDACRIS REGILLA
Healas, Sara

11:00-11:20  METABOLIC DEPRESSION AND SEASONAL VARIATION IN SUPERCOOLING POINT IN THE MOUNTAIN PINE BEETLE, DENDROCTONUS PONDERSOSAE
Lester, Jack

SESSION 13:
ROOM: 201

10:00-10:20  CALORIE INFORMATION AND FAST FOOD CHOICES AMONG COLLEGE STUDENTS
Bahnick, Holly; Krouse, Patricia; Morgan, Stenczie; Thompson, Diane

10:20-10:40  VITAMIN D STATUS OF MALE COLLEGIATE ATHLETES FOLLOWING SUPPLEMENTATION WITH AN ORAL VITAMIN D SPRAY
Storlie, Dana; Pritchett, Kelly; Pritchett, Robert; Cashman, Linda

10:40-11:00  THE EFFECTS OF OMEGA-3 FATTY ACIDS AND BEXAROTENE ON HUMAN BREAST CANCER PROGRESSION
Trappmann, Jessica; Hawk, Susan
SESSION 14:
ROOM: 202

10:00-10:20  THE ASSESSMENT OF SCHOOL PROGRAMS AND THE OUTCOME ON STUDENTS OF COLOR GRADUATION RATES
             Delgado, Arlene

10:20-10:40  THE COOPTATION AND APPROPRIATION OF AMERICAN INDIAN SPIRITUALITY
             Denner, Melissa

10:40-11:00  “FUTCHE”: CONSTRUCTING A BUTCH IDENTITY IN A FEMININE WORLD
             Lindquist, Jessica

11:00-11:20  EDUCATION FOR THEOCRACY IN IRAN
             Kaviani, Khodadad (Khodi)

SESSION 15:
ROOM: 301

10:00-10:25  PB&K EVENT PLANNING COMPANY
             Hahn, Whitney

10:25-10:50  G MARKET
             Driver, Galen

10:50-11:15  STYLE SWITCH
             Roberts, Mackenzie

SESSION 16:
ROOM: Outside of Wildcat Shop

10:00-11:20  FASHION SHOW: REVOLUTION
             Cook, Lindsay; Davis, Kaitlin; Eklund, Andrea; Feroglia, Chelsea; Flenniken, Arielle; Garza, Emilyesteli; Garza-Guerra, Sara; Jones, Megan; Miller, Grant; Peterschmidt, Bernadette

SESSION 17:
ROOM: Theatre

10:00-10:20  CWU NATIONAL TRUMPET COMPETITION TRUMPET QUINTET B PERFORMANCE - CYCLONE BY ERIC MORALES
             Mrozinsky, Andrew; Morgan, Thomas; Pulse, Nathan; Bull, Brian; Whitson, Casey

10:20-10:40  CWU NATIONAL TRUMPET COMPETITION TRUMPET QUINTET GROUP A, PERFORMING SUITE FOR 5 TRUMPETS
             Pickard, Stephen; Fredrickson, Chris; Martinson, Sarah; Stein, Jon; Hinckley, David

10:40-11:00  FASCH CONCERTO FOR TRUMPET
             Mrozinsky, Andrew

11:00-11:20  THE SIGHT OF SOUND
             Sawyer, Holly
### SESSION 18:  
**ROOM: 135**

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<tr>
<th>Time</th>
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<tr>
<td>11:40-12:00</td>
<td>SHALL WE DANCE ACROSS CULTURES? CONSTRUCTING MASCULINITY IN JAPAN AND HOLLYWOOD.</td>
<td>Brand, Bevin</td>
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<td>12:00-12:20</td>
<td>CIVIL RELIGION IN “CLOUDY WITH A CHANCE OF MEATBALLS”</td>
<td>Conrad, Jay</td>
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<td>12:20-12:40</td>
<td>LIGHTING THE COUNTRY WIFE</td>
<td>Carter, Andrew</td>
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<td>12:40-1:00</td>
<td>LIGHTING THE FASHION ODDITY</td>
<td>Carter, Andrew</td>
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### SESSION 19:  
**ROOM: 137A**

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<tr>
<td>11:40-12:00</td>
<td>THE NON-FINALITY INTONATION OF CHILDREN’S DECLARATIVE STATEMENTS IN SPANISH AND ENGLISH</td>
<td>Falteisek, Zosha</td>
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<tr>
<td>12:00-12:20</td>
<td>PROSODIC TRANSFER FROM L1 SPANISH TO L2 ENGLISH IN AMBIGUOUS SENTENCES</td>
<td>Mitchell, Doug</td>
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<tr>
<td>12:20-12:40</td>
<td>A GRIMM DISCOVERY: THE ORIGINS AND DEVELOPMENT OF MODERN ENGLISH FRICATIVE SOUNDS</td>
<td>Penland, Trevor; Borst, Erick</td>
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<td>12:40-1:00</td>
<td>TARGET-LIKE ACQUISITION OF PAUSING</td>
<td>Sherren, Sarah</td>
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### SESSION 20:  
**ROOM: 137B**

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<th>Time</th>
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<tr>
<td>11:40-12:00</td>
<td>FTIR-ATR MEASUREMENTS OF POLYMER ADSORPTION TO TiO₂ SURFACES</td>
<td>Bryce, David</td>
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<td>12:00-12:20</td>
<td>SYNTHESIS AND CHARACTERIZATION OF ZnS/ZnO SEMICONDUCTOR NANOPARTICLES</td>
<td>Hall, Daniel</td>
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<td>12:20-12:40</td>
<td>TOTAL SYNTHESIS OF NOVEL BORONATED AMINO ACID ANALOGUES AS POTENTIAL INHIBITORS OF HIV-1 PROTEASE</td>
<td>Schreiber, John</td>
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<td>12:40-1:00</td>
<td>ANALYSIS OF CATHEPSIN-D INHIBITORY COMPOUNDS BY COMPUTATIONAL INTELLIGENCE METHODS</td>
<td>Williamson, Forrest; Hepler, Kristopher; Haberman, Zachary</td>
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SESSION 21:
ROOM: 140

11:40-12:00 DISCOVERING FUNCTION: LATE STAGE RETINAL NEURODEVELOPMENT
Iniguez, Jesus

12:00-12:20 THE SPEED OF HAPPINESS: ELUCIDATING THE MECHANISMS OF SEROTONIN-DEPENDENT LOCOMOTORY BEHAVIOR IN C. ELEGANS
Moen, Spencer

12:20-12:40 IDENTIFICATION OF PROTEINS THAT INTERACT WITH THE TRANSCRIPTION FACTOR Emx2 IN DEVELOPING MOUSE NEOCORTEX
Groves, Jennifer

12:40-1:00 INVESTIGATING THE EFFECTS OF THE PLASTICIZERS BISPHENOL A AND DI(2-ETHYLHEXYL)PHthalATE ON DOPAMINERGIC NEURONS IN A C. ELEGANS PARKINSON’S DISEASE MODEL
Valera, Amanda

SESSION 22:
ROOM: 201

11:40-12:00 UNIVERSITY BRANDING: THE ROLE OF INTERCOLLEGIATE ATHLETICS
Chandley, Josh

12:00-12:20 THE ANALYSIS OF NFL PLAYERS FANTASY FOOTBALL STATISTICS
Walker, Jr., Mark

12:20-12:40 NBA: THERE IS NO “I” IN TEAM
Borromeo, Derek

SESSION 23:
ROOM: 202

11:40-12:00 VISITOR OPINION IN ARTIFICIAL VS. NATURAL ENRICHMENT CONDITIONS
Reveles, Julie; Jensvold, Mary Lee

12:00-12:20 COMPARATIVE ANALYSIS OF LENGTH POLYMORPHISMS IN THE PROMOTER REGION OF THE SEROTONIN TRANSPORTER GENE (SLC6A4) IN CERCOPITHECIDAE
Simons, Noah; Winters, Sandra; Lorenz, Joseph

12:20-12:40 RADIOCARBON CHRONOLOGY FOR THE HOLE-IN-THE-WALL AND FRENCH RAPIDS ARCHAEOLOGICAL SITES, MIDDLE COLUMBIA RIVER
Vargas, Estanislado

12:40-1:00 TYPE IT LIKE YOU MEAN IT: AN ANALYSIS OF USES AND ABERRANT USES OF CHAT FUNCTIONS IN MMORPGS
Conrad, Jay; Jackson, Steve
### SESSION 24:
**ROOM: 301**

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<td>11:40-12:05</td>
<td><strong>OVERTIME RESTAURANT</strong>&lt;br&gt;Newell, Justin; Marmesh, Wade</td>
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<td>12:05-12:30</td>
<td><strong>ONE WORLD FITNESS</strong>&lt;br&gt;Hampton, Elizabeth</td>
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<td>12:30-12:55</td>
<td><strong>ELECTRONIC SHELF MANAGEMENT SOLUTIONS</strong>&lt;br&gt;Morrison, Jim</td>
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### SESSION 25:
**ROOM: Theatre**

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<td>11:40-12:00</td>
<td><strong>PIANO IN PRAGUE</strong>&lt;br&gt;Flaten, Erik</td>
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<td>12:00-12:20</td>
<td><strong>ROMANTIC DUO: TWO SIDES OF THE ENGLISH CHANNEL</strong>&lt;br&gt;Miles, Brian</td>
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<td>12:20-12:40</td>
<td><strong>THE VIOLA AS A SOLO INSTRUMENT</strong>&lt;br&gt;Jasper, Jessica</td>
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<td>12:40-1:00</td>
<td><strong>FRENCH-CANADIAN FOOT PERCUSSION: ORIGINS AND PRACTICE</strong>&lt;br&gt;Koran, Laurel</td>
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### SESSION 26:
**ROOM: 135**

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<tr>
<th>Time</th>
<th>Event</th>
<th>Speakers</th>
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<tr>
<td>1:10-1:30</td>
<td><strong>THE UNITED STATES, RUSSIAN LIVING RESOURCES OF THE BERING SEA: THE PRACTICALITY AND URGENCY OF JOINT MANAGEMENT OF TRANS-BOUNDARY RESOURCES</strong>&lt;br&gt;Barrow, Michael</td>
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<td>1:30-1:50</td>
<td><strong>GREEK LIFE AT WASHINGTON STATE UNIVERSITIES</strong>&lt;br&gt;Helkey, Shaun; Powell, Maxwell</td>
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<tr>
<td>1:50-2:10</td>
<td><strong>TRICHLOROETHYLENE, THE SILENT MASSACRE</strong>&lt;br&gt;Pace, Terri</td>
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### SESSION 27:
**ROOM: 137A**

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<tr>
<th>Time</th>
<th>Event</th>
<th>Speakers</th>
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<tr>
<td>1:10-1:30</td>
<td><strong>JAMES BOND AS VISUAL RHETORIC: A PEDAGOGICAL APPROACH TO THE COMPOSITION CLASSROOM</strong>&lt;br&gt;Johnson, Melissa</td>
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<tr>
<td>1:30-1:50</td>
<td><strong>JAMES BOND: THE MAN LOVED BY ALL</strong>&lt;br&gt;Sommerville, Sean</td>
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<td>1:50-2:10</td>
<td><strong>MUSIC THERAPY: THE EFFECT OF MUSIC ON DOMESTIC CHICKENS’ LAYING PATTERNS</strong>&lt;br&gt;Wenger, Lauren</td>
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<tr>
<td>2:10-2:30</td>
<td><strong>THE FACH SYSTEM IN OPERA</strong>&lt;br&gt;Curia, Angela</td>
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SESSION 28:
ROOM: 137B

1:10-1:30  POWER AND POSSIBILITIES OF MENTORING
           Lea, YiShan

1:30-1:50  A RESEARCH BASED STUDY ON CONSTRUCTIVISM AND CLASSROOM
           MANAGEMENT
           Ross, Molly

1:50-2:10  THE ACID TEST: DETECTING ONE STUDENT’S DISHONEST SUBMISSION OF
           ANOTHER’S WORK
           Whelan, Michael; Cattin, William

2:10-2:30  AN ANALYSIS OF EXPERIENTIAL LEARNING IN CONSTRUCTION MANAGEMENT
           Plugge, P. Warren; Roberts, Chris

SESSION 29:
ROOM: 140

1:10-1:30  RAPID DETECTION OF LACTIC ACID BACTERIA AND ACETIC ACID BACTERIA IN
           WINE
           De Rosa, Antonio

1:30-1:50  IDENTIFICATION OF SPOILAGE BACTERIA IN WASHINGTON WINE
           Nakamura, Yusuke

1:50-2:10  DEVELOPMENT OF ALTERNATIVE DIFFERENTIAL STAINING TECHNIQUE FOR
           STUDIES OF SOAP LAKE BACTERIA
           Lu, Shao Yeh

SESSION 30:
ROOM: 201

1:10-1:30  CIRCLE PACKING TO MINIMIZE NETWORK NEEDS
           Kastning, Mary; Rambish, Natalie; Milne, Jason

1:30-1:50  A STATISTICAL ANALYSIS OF THE GENERALIZED COLLATZ CONJECTURE
           Gill, Kohl

1:50-2:10  STATISTICS AND SMALL BUSINESS
           Cox, John

2:10-2:30  FACTORS AFFECTING GDP
           Powell, Holly

SESSION 31:
ROOM: 202

1:10-1:30  USING BRAIN IMAGING TO DETECT DECEPTION: A REVIEW OF FMRI AND EEG
           STUDIES
           Dodgen, Lisa

1:30-1:50  THE EFFECTS OF MATERNAL SEPARATION ON ADULT ALCOHOL RESPONSES IN
           MICE
           Beckstrom, Rachel
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<th>SESSION 32:</th>
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| 1:10-1:30  | HUMANITY AND SCIENTIFIC ADVANCEMENT: POTENTIAL HARMONY OR DESTRUCTION  
Jonassen, Katelyn |
| 1:30-1:50  | “GREAT AND TERRIBLE,” OR “GREAT AND POWERFUL”: THE REDEMPTION OF O.Z. DIGGS, THE WIZARD OF OZ  
Hegstrom Oakey, Jesse |
| 1:50-2:10  | ON MONSTERS: A CULTURAL AND LITERARY ANALYSIS  
Lehrman, Nathan |
| 2:10-2:30  | SEX IN ANCIENT GREECE: EXPLORING THE DYNAMICS OF MARRIAGE AND Pедерастi  
Nelson, Reesa |

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<th>SESSION 33:</th>
<th>ROOM: Theatre</th>
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| 1:10-1:30  | TRANSITIONS  
Barsotti, Melisa |
| 1:30-1:50  | DISCONNECT  
Young, Therese |
| 1:50-2:10  | ONE VOICE  
Zelenak, Megan |

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<th>SESSION 34:</th>
<th>ROOM: 135</th>
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| 2:40-3:00  | LATINO POLITICAL PARTICIPATION AND REPRESENTATION IN THE PACIFIC NORTHWEST: THE CASE OF WAPATO, WASHINGTON (PART ONE)  
Clemons, Conner; Rich, Brian; Rosas, Uriel |
| 3:00-3:20  | LATINO POLITICAL PARTICIPATION AND REPRESENTATION IN THE PACIFIC NORTHWEST: THE CASE OF WAPATO, WASHINGTON (PART TWO)  
Benham, Austin; Griffith, Jared; Kaskla, Kristian |
| 3:20-3:40  | A CRITICAL ASSESSMENT OF CONFLICT THEORY  
Wright, Daniel |

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<th>SESSION 35:</th>
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| 2:40-3:00  | WHEN THEATRE BECOMES HOME: THE EXILE AND THEATRE OF THE IRAQI PLAYWRIGHT JAWAD AL-ASSADI  
Assaf, Sahar |
| 3:00-3:20  | NINETEENTH-CENTURY AMERICAN THEATRE: REEXAMINING THE CAREER OF CHARLOTTE CUSHMAN AS ACTRESS-MANAGERESS  
Mayes, Jennifer |
| 3:20-3:40  | A FRESH PERSPECTIVE ON THE WRITINGS AND THEORIES OF SARAH KANE AS DEMONSTRATED THROUGH A DRAMATURALGICAL STUDY OF CLEANSED  
Pierson, Kate |
SESSION 36:
ROOM: 137B
2:40-3:00  UNINTENDED OUTCOMES: SOCIODEMOGRAPHIC DIVERSITY, WITHIN-SCHOOL STRATIFICATION, AND ACCESS TO MIDDLE LEVEL ARTS CURRICULA
Smith, Bret; Hoffman, Adria

3:00-3:20  METAPHORIC STORIES IN FIELD SUPERVISION OF STUDENT TEACHERS
Ballou, Gary

3:20-3:40  SUCCESSFUL STUDENTS IN LEADERSHIP ROLES AND ON FACULTY COMMITTEES IN HIGHER EDUCATION- HIGHLY EFFECTIVE PROFESSIONAL GROWTH OPPORTUNITIES
Donahoe, Susan; Bridge, Allyson; Holsworth, Jesse; Folkestad, Kyla

SESSION 37:
ROOM: 140
2:40-3:00  TRAVEL AS A TRANSFORMATIVE EDUCATION
Lea, YiShan; Vilieger, Hannah; Dinwiddie, Michelle; Kiel, Dakota; Milne, Rachel

3:00-3:20  THE ECO-FRIENDLY CONSUMER: WILLING TO SPEND MORE ON APPAREL?
Smith, Kara; Larson, Devin; McHenry, Courtney; Barber, Jamie

3:20-3:40  EMPLOYERS’ BENEFITS OF COOPERATIVE BUSINESS EDUCATION IN NORTH AMERICA, EUROPE, AND ASIA
Takei, Hideki; Braunstein, Lori; Wang, Fen

SESSION 38:
ROOM: 201
2:40-3:00  THE EFFECTS OF ENVIRONMENTAL FACTORS ON HUMAN LIFE SPAN
Hart, Douglass

3:00-3:20  MODELING WORLD HEALTH: STATISTICAL ANALYSIS ON THE ASSOCIATIONS OF HEALTH-RELATED FACTORS
McDonald, Chloe

3:20-3:40  COMPARING AND PREDICTING ANDROID SMARTPHONE UPGRADES
Nesbitt, Alex

SESSION 39:
ROOM: 202
2:40-3:00  INTERNATIONAL PERSPECTIVES ON SUSTAINABLE TOURISM: ECUADOR
Booth, Carina

3:00-3:20  BLACK CARBON CONCENTRATIONS IN SNOW FROM THE WASHINGTON SNOWPACK
MacLeod, Alex

3:20-3:40  STREAM ECOSYSTEM VARIABILITY IN TANEUM CREEK: SYNTHESIZING TWO YEARS OF DATA COLLECTION PRIOR TO LARGE WOOD ADDITION
Arango, Clay
SESSION 40:
ROOM: 271

3:00-3:20  THE EFFECTS OF CAFFEINE ON 5K RUNNING PERFORMANCE FOLLOWING EXERCISE INDUCED MUSCLE SORENESS
Campbell, Stephanie; Pritchett, Robert; Pritchett, Kelly

3:20-3:40  STIRRING THE POT: BUILDING THE SCHOLARSHIPS OF APPLICATION, TEACHING, AND ENGAGEMENT THROUGH A COMMUNITY KITCHEN
Pearson, Rebecca

SESSION 41:
ROOM: 301

2:40-3:00  THOMAS HOBBES AND FRIEDRICH NIETZSCHE: AN EXAMINATION OF SELF-INTEREST AND THE WILL TO POWER
Thomas, Nathan

3:00-3:20  CINDERELLA VS. VASILISA: EXPLORING TRADITIONAL VIEWS OF IDEAL FEMININITY IN WESTERN EUROPE AND RUSSIA THROUGH THE LENS OF THE FAIRYTALE
Wildes, Sheena

3:20-3:40  IBSEN'S PERFECTLY DYSFUNCTIONAL FAMILY
Orndorff, John

3:40-4:00  SWIFT'S WOMEN
Orndorff, Jessica

SESSION 42:
ROOM: Theatre

2:40-3:00  CENTRAL WASHINGTON UNIVERSITY SOURCE ROCK MUSIC VIDEO - TURN IT UP!
Lupton, Robert; Norrish, Winston; Lupton, Alexandra; Larsen, Allen

3:00-3:20  MAN OF PASSION
Giles, Mark

3:20-3:40  HAMMER TIME
Conrad, Jay; Odinzoff, Travis
POSTER PRESENTATION SCHEDULE

Only authors are listed for each paper/poster.
Mentors are shown in the ABSTRACT portion of this program.

UNIVERSITY CENTERS

CWU-LYNNWOOD
Posters on display 18 May at CWU-Lynnwood

1. QUALITY OF SAFEWAY INC.
   Chueh, Wei Ting

2. EVERGREEN MAINE SHIPPING CORP.
   Yen, Andrew

3. COSTCO INVENTORY MANAGEMENT AND QUALITY MANAGEMENT SYSTEM
   Lomboy, Rowena

4. PACCAR AND LEAN SIX SIGMA: OVERCOMING DIFFICULTIES TO REALIZE SUBSTANTIAL BENEFITS WHEN IMPLEMENTING NEW LSS PROJECTS
   Lorenzo, Roemer

5. PRIVATE SAUSAGE MANUFACTURING COMPANY
   Funk, Jason

6. BOEING INVENTORY MANAGEMENT
   Nguyen, Tony

7. TOMMY CO. WASTE REDUCTION STRATEGY
   Liao, Tommy

8. SUPPLY CHAIN DEVELOPMENT (COLUMBIA VALLEY BREWING CO.)
   Smith, Charles

9. EMERALD CITY SMOOTHIE: POINT OF SALES SYSTEM
   Moore, Monica

10. SCREEN SHORTAGE
    Arvizu, Axel

11. VARIATION IN PRESENCE OF COMMUNITY DEVELOPMENT FINANCIAL INSTITUTIONS IN WASHINGTON STATE
    Johnson, Midori
POSTER PRESENTATION SCHEDULE

Only authors are listed for each paper/poster. Mentors are shown in the ABSTRACT portion of this program.

POSTER SESSION 1
BALLROOM

Posters on display from 8:30-11:00
Presenters must be by posters during judging from 9:30-11:00

CHEMISTRY

1. A PILOT PROJECT TO EXPLORE THE ANTICANCER POTENTIAL OF NATURAL PRODUCTS OF SELECTED PLANTS OF THE PACIFIC NORTHWEST AND WESTERN UNITED STATES
   Eisenberg, Victoria

2. STUDIES TOWARD THE TOTAL SYNTHESIS OF 5-BROMO-8-METHOXY-1-METHYL-BETA-CARBOLINE
   Tenney, Ashley

3. STUDY OF HOST-TO-ACTIVATOR ENERGY TRANSFER EFFICIENCY IN YBO₃:Tb³⁺
   Wallace, Maxwell

4. SYNTHESIZING Sr₂B₂O₆:Eu²⁺ USING SrB₄O₇:Eu²⁺ AS A PRECURSOR
   Kilburn, Troy; Orme, Patrick

5. TOWARD THE SYNTHESIS OF NOVEL BORONATES AS POTENTIAL HIV-1 PROTEASE INHIBITORS
   Frank, Michael; Faulkner, Andrea; Holmberg, Leah; Jennings, Julia

6. SYNTHESIS OF 5,6-DIHYDROPYRAN-2-ONE AS POTENTIAL INHIBITORS OF HIV-1 PROTEASE
   Sigurjonsson, Kristin; Nye, Jesse; Palmer, Scott

7. CROSS-CALIBRATION OF TWO ANALYTICAL TECHNIQUES FOR THE DETERMINATION OF PICO-TO NANO-MOLAR LEVELS OF IRON IN AQUEOUS SOLUTIONS
   Hinz, Daniel; Wood, Whitney

8. VALIDATION OF REDOX POTENTIAL TEST FOR ESTIMATING TOXICITY OF SOOT
   McNall, Staci

9. DETECTION OF RADIOISOTOPES FROM THE FUKUSHIMA DAIICHI NUCLEAR PLANT DISASTER
   Mendoza, Cesar; Affholter, Randle

10. IDENTIFICATION OF NEOCORTICAL PROTEINS THAT INTERACT WITH THE TRANSCRIPTION FACTOR Sp8
    Mullan, Michael

11. POLYELECTROLYTE SURFACTANT COMPLEXES
    Buck, Kathleen; Agren, James

12. A EXPLORATORY STUDY OF THE “GREEN” SOLVENT FOR ORGANIC CHEMISTRY—IONIC LIQUID
    Yi, Fan; Kellar, Casey
13. THE CONVERSION OF 1,1,2-TRICHLOROETHYLENE (TCE) INTO 1,2-DICHLOROVYNIL-AKYL ETHERS, USING 1-BUTYL-3-METHYL-IMIDAZOLIUM HEXAFLUOROPHOSPHATE AS A PHASE TRANSFER CATALYST
Markward, Adam

14. THE IMPLEMENTATION OF FREEWARE INTO AN UNDERGRADUATE BIOCHEMISTRY LAB
Petersen, Brandon; Printz, Sarah

15. A LOW-COST ANALOG TO DIGITAL CIRCUITRY FOR GENERAL CHEMISTRY EXPERIMENTS
Richardson, Matthew

16. EFFECTS OF C_{60} ON ELECTRON FLOW THROUGH MITOCHONDRIAL COMPLEXES III AND IV
Teng, Hsiang

17. MONO(2-ETHYLHEXYL) PHTHALATE (MEHP) AS A POTENTIAL INHIBITOR OF THE MITOCHONDRIAL ELECTRON TRANSPORT CHAIN
Dragness, Ryan

18. EFFECT OF HIGH FAT DIET AND DEFICIENT NICOTINAMIDE NUCLEOTIDE TRANSHYDROGENASE IN THE PRODUCTION OF ATP IN C. ELEGANS
Carter, John

19. THE EFFECTS OF QUANTUM DOTS AND THEIR CHEMICAL COMPONENTS ON MITOCHONDRIAL FUNCTION
Rosario, Sara; Thomas, Carin

MATHEMATICS

20. OPTIMAL HALFPIPE SHAPE
Mendoza, Adriana; Andersen, Noah; Dean, Raven

21. AN INVESTIGATION OF SOLUTIONS TO A NON-LINEAR SUSPENSION BRIDGE MODEL
Kastning, Mary

22. TEEN SMOKING
Mo, Yasi

23. UNEMPLOYMENT
Conaway, Andrew

24. HATE CRIMES AND THEIR BIASES
Wing, Whitney

25. INTERNET ADDICTION
Li, Hui

POLITICAL SCIENCE

26. THEY CALL IT DEMOCRACY: REPUBLICAN GOVERNMENT IN EUROPE, CHAPTER 1: HISTORICAL CONTEXT AND POLITICAL CULTURE
Caryl, Benjamin

27. THEY CALL IT DEMOCRACY: REPUBLICAN GOVERNMENT IN EUROPE
Smith, Dustin
28. CHAPTER 4: STRUCTURES OF GOVERNMENT FROM THE STUDENT GENERATED TEXT: THEY CALL IT DEMOCRACY: REPUBLICAN GOVERNMENT IN EUROPE
   MacDowell, Jonathan

29. CHAPTER 5: EUROPEAN COURTS AND JUDICIAL REVIEW FROM THE STUDENT GENERATED TEXT: THEY CALL IT DEMOCRACY: REPUBLICAN GOVERNMENT IN EUROPE
   Madtson, Jon

30. JOBS AND ECONOMIC RECOVERY 2011
   Ames, Tyson

31. WOMEN & CROSSING THE LINE OF DEPARTURE: A GENDER PROBLEM OR LIONESS?
   Gill, Brian

PSYCHOLOGY

32. THE USE OF COLOR VERSUS BLACK-AND-WHITE IMAGES IN A DELAYED-MATCH-TO-SAMPLE (DMTS) TASK
   Niegowski, Amanda; Ring, Ian; Huss, Kathryn; Mariscal, Carina; Loesken, Axel

33. THE EFFECTS OF ALCOHOL AND MATERNAL SEPARATION ON SOCIAL INTERACTION IN ADOLESCENT MICE
   Chambers, Kayla; Hoang, Melissa

34. WHO’S RATING THE RATERS? AN EXAMINATION OF CONTENT ANALYSIS
   Stefani, Whitney

35. EFFICACY OF ALCOHOL EDUCATION PROGRAMS
   Biddle, Ryan; Farmer, Gail; Gabriel, Kara

36. NEURAL SOURCE LOCALIZATION OF COMPLEX TONE PROCESSING AND HEMISPHERIC ASYMMETRY
   McKenzie, Whitney; Ackley, Daniel; Greenwald, Ralf

37. REGIONAL TRENDS OF SCHOOL PSYCHOLOGISTS IN WASHINGTON STATE
   Lund, Golda

38. MOBILE PHONE TECHNOLOGY AND ITS EFFECT ON AFFECT: A REPLICATION STUDY
   Parker, Joshua; Gregory, Brianne

39. GENDER DIFFERENCES: LEARNING STRATEGIES AND PERCEIVED SOCIAL SUPPORT
   Ramirez, Daniel

40. INVESTIGATING INTERROGATION TACTICS THAT LEAD TO FALSE CONFESSIONS
   Dodgen, Lisa

41. THE (NULL) EFFECT OF EXPERT WITNESS ON JURY OUTCOME
   Polage, Danielle

42. FABRICATION INFLATION INCREASES AS SOURCE MONITORING ABILITY DECREASES
   Polage, Danielle
ART

43. INVENTIONS OF BEAUTY AND TRUTH
    Pantea, Leah

44. CONTEMPORARY WOODFIRE KILN TECHNOLOGIES AND ESTHETICS
    Brislawn, Ryan

45. THE APPLICATION OF MAJOR PHILOSOPHICAL THEMES TO CONTEMPORARY CERAMIC SCULPTURE
    Donovan, Daniel
POSTER SESSION 2
BALLROOM

Posters on display from 11:15-1:45
Presenters must be by posters during judging from 12:00-1:30

FASHION DESIGN

1. PRECIOUS GEMS
   Cook, Lindsay

2. BLOOM
   Davis, Kaitlin

3. FEMININE MYSTIQUE
   Eklund, Andrea

4. VINTAGE SOUL
   Feroglia, Chelsea

5. THE MISSING PIECE
   Flenniken, Arielle

6. PUMA
   Garza, Emilyesteli

7. PRINCESS ARIEL
   Garza-Guerra, Sara

8. EOS
   Jones, Megan

9. BILLIE JEAN
   Miller, Grant

10. HEAVY HEART
    Petersschmidt, Bernadette

GEOGRAPHY

11. RESURRECTING A RIVER: A THESIS PROPOSAL FOR EVALUATING THE REINTRODUCTION OF SALMON TO THE ELWHA RIVER AS A MEANS OF INFLUENCING SENSE OF PLACE
    Johnson, Kelseyanne

12. OF CONGESTION AND CONSEQUENCES: AN AERIAL ANALYSIS OF RESIDENTIAL LAND USE AND ROAD SYSTEMS IN NORTHERN VIRGINIA
    Keeney, Joe

13. THE CENTER FOR GEOSPATIAL POETRY: PROGRAM FOCUS AND METHODOLOGY
    Thompson, Marc

GEOLOGICAL SCIENCES

14. HISTORICAL AND PRESENT ACTIVITY OF A LANDSLIDE NEAR NACHES, WASHINGTON
    Calvin, Jacob
15. **REMOVED LIDAR-BASED, SEISMIC-HAZARD MAPPING AND DIGITAL DATABASE FOR THE LOMA PRIETA SECTION OF THE SAN ANDREAS FAULT SYSTEM, NORTHERN CALIFORNIA, U.S.A.**  
*Gordon, Eric; Tao, Eric; Field, Sam; McBride, Amara; Talley, Jessica*

16. **THREE YEARS OF SNOW-WATER EQUIVALENT DATA FROM SNOQUALMIE PASS, WASHINGTON, AS DETERMINED BY ELLensburg HIGH SCHOOL STUDENTS.**  
*Jenkins, Matthew; Wheeler, Avery; Brunk, Breanna; Ensz, Carsten*

17. **USING VARIATIONS IN GARNET COMPOSITIONS TO QUANTITATIVELY INTERPRET TEMPERATURE AND PRESSURE OF HIGH-PRESSURE METAMORPHIC ROCKS**  
*Oduber, Kurtis*

**PHYSICS**

18. **CONSTRUCTION OF SUPPORT DEVICES FOR USE IN THE FAR-INFRARED LASER LABORATORY**  
*Bailey, McKinley*

19. **INVESTIGATION OF ACTIVE REGION PROPERTIES FOR SOLAR FLARE FORECASTS**  
*Fredsti, Felicit*

20. **MODEL OF THE SEASONS**  
*Kratzer, Joshua; Reed, Carly; Fredsti, Felicit*

21. **TASK GROUP 119 VALIDATION OF THE WENATCHEE VALLEY MEDICAL CENTER (WVMC) EQUIPMENT**  
*Magenis, Marilyn*

22. **CENTRAL WASHINGTON UNIVERSITY OBSERVATORY MODIFICATIONS**  
*Neal, Colby; Lawler, Andrew*

**STEP**

23. **STEP SCIENCE SEMINAR: A PROJECT-BASED INTERDISCIPLINARY FRESHMAN SCIENCE CURRICULUM**  
*Braunstein, Michael; Carnell, Lucinda; Ely, Lisa; Holt, Renee; Jackson, Michael*

**RESOURCE MANAGEMENT**

24. **GIS JOB MARKET**  
*Cannon, Jamie; Hickey, Robert*

25. **COUPLING INTERTIDAL COMMUNITY SURVEYS AND MANAGEMENT STRATEGY EVALUATIONS TO ASSESS THE EFFECTIVENESS OF MARINE PROTECTED AREAS IN THE PUGET SOUND, WASHINGTON**  
*Dilworth, Erin*

26. **MINE RECLAMATION BOND PRICING POLICY: AN ANALYSIS OF THE EFFECTIVENESS OF SURFACE MINING REGULATION - THESIS PROPOSAL**  
*Harrison, Isa*

27. **A HOST FISH IDENTIFICATION FOR GONIDEA ANGULATA IN THE YAKIMA RIVER BASIN**  
*Maine, Alexa*
28. A COMPARATIVE ANALYSIS OF NATURAL AND HUMAN-MADE ROCK HABITATS FOR AMERICAN PIKAS ALONG INTERSTATE 90 IN THE CENTRAL WASHINGTON CASCADE RANGE
   Parks, Raychel; Ernest, Kristina; Garvey-Darda, Patricia

29. ENHANCING WATERSHED AWARENESS: DEVELOPMENT OF AN EDUCATIONAL POSTER TO PROMOTE UNDERSTANDING OF THE IMPORTANCE OF OUR STATE’S WATER RESOURCES
   Reese, Angela; Arthur, J.; Bishop, T.; McDermott, W.; Schafer, J.

30. APPLYING WETLAND RATING SYSTEMS TO ASSESS FUNCTIONS OF WETLANDS CREATED BY MASS WASTING EVENTS
   Wachholder, Tommy

31. EFFECTS OF FERAL HORSE GRAZING ON GREATER SAGE-GROUSE NESTING HABITAT IN SOUTHEASTERN OREGON
   Walling, Jessica

32. HEADCUT INCISION HEIGHT AS AN INDICATOR OF VEGETATION CHANGE IN TWO INCISED WET MEADOWS, OCHOCO NATIONAL FOREST, OREGON
   Sheahan, Jamie

WATERS (NSF-FUNDED GRANT: WATERSHED ACTIVITIES TO ENHANCE RESEARCH IN SCHOOLS)

33. FLOOD ATTENUATION BY WETLAND AREA: RESULTS OF STREAM TABLE EXPERIMENTAL MODEL
   Sheahan, Jamie; Nover, Miranda; Ricard, Rylee; Swedberg, Tony; Kay, Travis

34. STREAM EROSION RESPONSE TO RAPID LATERAL TILTING
   Sheahan, Jamie; Creech, Ryan; Sully, Hunter; Garcia, Kassandra; Anderson, Molly

35. SCIENCE, MATH, AND SOGGY SOCKS: EIGHTH GRADE PRE-ALGEBRA STUDENTS INVESTIGATE WATER QUALITY IN SELAH, WASHINGTON
   Bishop, Tiffany

36. NITRATES IN RAIN WATER
   Yoder, Andrew; Hodges, Dave; Helland, Terry;

37. MIDDLE SCHOOL STUDENTS CONDUCT CONSERVATION RESEARCH BY TRACKING TOADS
   Palmeri-Miles, Amber

38A-B. EXPLORING THE PAST TO UNDERSTAND THE PRESENT
   Palmeri-Miles, Amber; Browitt, Lisa

39A-G. INQUIRY BASED FIELD RESEARCH IN THE SEVENTH-GRADE CLASSROOM
   Palmeri-Miles, Amber; Griswold, Trish; O’Connor, Killian; Hyatt, Shayna; Johnson, Cody; Bilyeu, Sammy; Wallace, Brooke; Burroughs, Delaney; Terrill, Holly

40. NITRATE PHOSPHATE & AMMONIA LEVELS IN THE NACHES, TIETON AND YAKIMA RIVERS
   Rosario, Sara; Storlie, Clarice; Davis, Hohman, Ben; Bolong, Josh; Peral, Aided; Davis, Jonathan; Borges, Yuri; Renteria, Mirka; Vizcaino, Cecilia; Morris, Arianna; Whitmer, Grace; Ball, Bryan

41A-C. LEAPING TO CONCLUSIONS AT DAVIS HIGH SCHOOL
   Reitz, Melissa; Sears, Jose; Albarran, Edith; Salazar, Frankie; Bautista, Maria; Ramos, Ana; Anderson, Tenisha; Martinez, Madai; Martinez, Carolina

42A-B. CONSUMERS BEWARE: A DAVIS HIGH SCHOOL CONSUMER REPORT
   Reitz, Melissa; Medina, Maribel; Rodriguez, Cristian; Hernandez, Kassie; Juarez, Samantha; Villa, Nataly
ANTHROPOLOGY & MUSEUM STUDIES

1. SOLDIERS LANGUAGE, AND CULTURALLY SIGNIFICANT TERMS.
   Brouwer, Eric

2. CROSS CULTURAL ANALYSIS OF TIPI STRUCTURES AMONG THE BLACKFOOT, CHEYENNE, CROW AND LAKOTA.
   Ratliff, Joel

3. ANALYSIS OF DELTA^{18}O AND DELTA^{13}C DATA ACQUIRED FROM MARGARITIFERA FALCATA SHELL (SITE 45KT315, KITTITAS COUNTY, WA): HOLOCENE ENVIRONMENTAL CHANGE ON THE COLUMBIA PLATEAU
   Ferry, Joy

BIOLOGY

4. DAPHNIA ON ICE: ASSESSMENT OF DNA DAMAGE IN DAPHNIA PULEX AT -10°C
   Wooller, Page

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A COMPUTER MODEL OF THE VIBRATIONAL RESPONSE OF FLUID-FILLED SHELLS

Abdul-Wahid, Sami
Faculty Mentor(s): Andy Piacsek, Physics

Session: 3
Oral Presentation 8:30-8:50 in Room 137B

Elevated intracranial pressure (ICP), often due to traumatic brain injury, can lead to brain damage or death. The standard technique to measure ICP is invasive and carries significant risks; several noninvasive strategies are being investigated, but none have been approved for use on people. The current project explores a strategy that models the human head as a fluid-filled shell with resonance frequencies that are affected by the internal fluid pressure. The goal of this project is to verify, by computer model and experiment, that fluid-filled shells exhibit the hypothesized frequency shift and that such shifts will be measurable for the range of ICP fluctuations experienced by humans. The computer model, which was developed using the COMSOL multi-physics modeling package, specifies the dimensions and material properties of a spherical shell, the fluid inside and outside the shell, and an acoustic source of excitation. This corresponds closely to the experimental set-up. As in the experiment, the acoustic source produces a sine wave that is swept, but within a frequency range of 7 kHz to 17 kHz, while the vibration response of the shell is determined at the location of maximum acceleration. Results of the computational experiment are compared with experimental data and with analytical solutions. Verification of the computer model for a spherical geometry will lead to applying the model to more realistic geometries derived from actual skulls.

JOBS AND ECONOMIC RECOVERY 2011

Ames, Tyson
Faculty Mentor(s): Rex Wirth, Political Science; Todd Schaefer, Political Science

Poster Session 1: 8:30-11:00 - Poster #30

The poster is built around quotations from the theoretical works of prominent economists. It will pull these beneficial theories together to create the conceptual framework for a new kind of dynamic research. Finally, it will introduce the proposed project for which the framework has been developed: a multi-year case study examining jobs and economic recovery. The Jobs and Economic Recovery Act of 2011 will be monitored over time to ascertain how outcomes can be improved through the manipulation of incentives. In this initial presentation, I will conclude with a few potentially fruitful hypotheses.
PURIFICATION OF PARAFLAGELLAR ROD PROTEINS FROM *LEISHMANIA MAJOR*

Anderson, Heidi

Faculty Mentor(s): Gabrielle Stryker, Biological Sciences; Blaise Dondji, Biological Sciences

*Leishmania major* is a single-celled parasite responsible for the disease cutaneous leishmaniasis. Cutaneous leishmaniasis, also called “Baghdad boil” or “Oriental sore” among other names, causes disfiguring skin ulcers which will self-heal in individuals with a competent immune system. Current estimates are that species of *Leishmania* infect some 12 million people in eighty-eight countries. Studies in a closely related parasite, *Trypanosoma cruzi*, have established that the flagellum of that parasite is highly antigenic and can protect mice from an otherwise lethal challenge. The eukaryotic flagellum is one of the most complex macromolecular structures found in cells, containing more than 250 proteins. A unique structure in the flagella of trypanomastids is the paraflagellar rod (PFR). The PFR constitutes a lattice of cytoskeletal filaments that lies alongside the axoneme in the flagella. The PFR has been shown to be the antigenic portion of the flagellum in *T. cruzi*. Since *L. major* also possesses a PFR, this study aims to explore if a similar protective immune response is generated by immunization with parasite-derived *L. major* PFR proteins. Toward this goal, we have been working to develop a protocol for purifying *Leishmania* PFR proteins. The protocol involves lysis of the parasite, extraction of proteins in a series of salt solutions, further purification using SDS-PAGE, extraction of protein bands of the correct molecular weight, electroelution of the proteins from the gel, and concentration and quantification of the PFR proteins.

STREAM ECOSYSTEM VARIABILITY IN TANEUM CREEK: SYNTHESIZING TWO YEARS OF DATA COLLECTION PRIOR TO LARGE WOOD ADDITION

Arango, Clay

Faculty Mentor(s): Clay Arango, Biological Sciences

Session: 39
Oral Presentation 3:20-3:40 in Room 202

Stream restoration projects rarely include monitoring to assess their effectiveness, particularly for ecosystem-level changes. Taneum Creek, a tributary to the Yakima River, has been the focus of stream restoration projects including fish passage barrier removal and large wood addition. During summer 2009 and 2010, I measured stream hydraulic and nitrogen cycling parameters in upstream and downstream monitoring sites that received heavy inputs of large wood in a fall 2010 restoration project. The two sites did not differ in stream discharge but the downstream site had a larger transient storage zone (paired t-test, p=0.0007), indicating longer water residence time in the downstream reach. Because water residence time can increase water-column nitrogen removal, the larger transient storage zone may have contributed to the lower ammonium concentrations we observed in the downstream site (rmANOVA, p<0.0001). Lower ammonium concentrations downstream did not translate to differences in ammonium demand between the reaches, but ammonium demand was fairly high in both reaches compared to other published values. Large wood addition to streams can increase hydraulic exchange with sediments, leading to higher nitrification rates (i.e., microbial conversion of ammonium to nitrate), but we found no differences in pre-wood addition sediment nitrification rates between the study reaches. Instead, we found that sediment nitrification was positively related to respiration of sediment organic matter (p=0.011, r²=0.49), which produces ammonium. This finding suggests that if large wood addition promotes organic matter retention, sediment nitrification rates may increase as a result of wood addition. Post-wood addition measurements will occur in summer 2011.
SCREEN SHORTAGE
Arvizu, Axel
Faculty Mentor(s): Kun Liao, Finance & OSC

Lynnwood Center Poster Session - Poster #10

In 2010, the touch screen cellular phone industry had the biggest growth in the history of the smart phone industry. HTC, a Taiwanese cellular phone manufacturer that manufactures a wide variety of touch screen smart phones, had one of the best years in terms of sales and revenue. One of the biggest problems the touch screen, smart phone industry faced last year was the shortage of critical components, such as the actual screen. There was higher than expected demand and lower than expected supply. HTC encountered the supply shortage of screens and it caused many shortages of cell phones in different countries and in many cases the problem cost HTC sales. The question now is if it will be beneficial for HTC to manufacture their own cell phone screens based on current technology or future technology? Or will it HTC be better off sourcing the screens, even if they continue to face shortages? I will be conducting a study of the effects the screen shortages had on HTC in terms of how the shortages affected the supply chain, sales and revenue. Also, I will research the possibility of HTC to in-source the cell phones screens rather than outsource it, and how this change will benefit HTC. I believe that it will be beneficial for HTC to begin manufacturing their own screens in the near future which will help them if there is a shortage in the future from their suppliers.

WHEN THEATRE BECOMES HOME: THE EXILE AND THEATRE OF THE IRAQI PLAYWRIGHT JAWAD AL-ASSADI
Assaf, Sahar
Faculty Mentor(s): Christina Barrigan, Theatre Arts

Session: 35
Oral Presentation 2:40-3:00 in Room 137A

The phenomenon of theatre in exile, despite its current relevance, is still academically understudied. The international conference on “Theatre and Exile” at the University of Toronto in 2002 called for a critical approach that integrates the personal with the theatrical to depict the political, social, and cultural scope of the phenomenon. As a response, this study opens the door for scholarship on the Iraqi theatre in exile by focusing on the experience of the exiled Iraqi playwright Jawad Al-Assadi. The aim is to examine the politics of his exile and the representation of the concept of place in his theatre to infer broader insights on the impact of exile on Iraqi artists. Through a narrative interview with Al-Assadi and a close analysis of his unpublished play *Baghdadi Bath*, the study explores the influence of Al-Assadi’s exile on his theatre and the influence of his theatre on his exile. First, by juxtaposing Al-Assadi’s personal narrative with the analysis of *Baghdadi Bath*, the study reveals the impact of the Iraqi political situation on Al-Assadi as a theatre practitioner and the complexity of the relationship between his theatrical creation and his exile. Second, by situating the play analysis within a postcolonial framework and within Una Chaudhuri’s concept of geopathology, *Baghdadi Bath* becomes not only an anti-imperial play but essentially a play about exile. By answering the calls made by scholars in 2002, this study establishes a new avenue of research for Iraqi theatre.
A COMPARISON OF BODY MEASUREMENTS AND GROWTH RATE IN THE BLACK FIELD CRICKET (GYLLUS FIRMUS) BETWEEN TWO WING TYPES
Babinski, Brittany; Buxel-Florenzen, Stefanie; Sun, Lixing
Faculty Mentor(s): Lixing Sun, Biological Sciences

Poster Session 3: 2:00-4:30 - Poster #16

The black field cricket, Gryllus firmus, is an important model organism for biological studies. Not only is it easy to work with, but also it has a short life history, and produces many offspring. There are two different wing types found in this species: long wing (LW) and short wing (SW). If overall cricket size is different between LW and SW types, research that focuses on breeding and reproductive success could be affected. We compared differences in size and growth rate between the LW and SW morphs as well as between the sexes. To monitor growth rate, hatchlings of the same age were inventoried twice a week for newly morphed adults. New adult morphs were recorded with the date and wing type. Adult crickets were identified using a tagging system of letters and numbers. Pictures were taken on millimeter-grid graph paper and measurements of body length and head width were recorded. Wing type was also recorded. Comparisons between LW and SW male and female head widths and body lengths were done using a two-way ANOVA. The number of LW and SW males and females were compared using a Chi-square test. Preliminary findings indicated a significant difference in body lengths between LW and SW male crickets. Since the LW and SW measurements appeared to be significantly different, this could affect research with this organism on a larger scale and could have implications in future studies.

CALORIE INFORMATION AND FAST FOOD CHOICES AMONG COLLEGE STUDENTS
Bahnick, Holly; Krouse, Patricia; Morgan, Stenczie; Thompson, Diane
Faculty Mentor(s): Rebecca Pearson, Nutrition, Exercise, & Health Services

Session: 13
Oral Presentation 10:00-10:20 in Room 201

A lack of awareness of the caloric density of foods that are consumed in fast food restaurants may be a significant contribution to the epidemic of obesity. Four hundred students from Central Washington University were recruited; of these, approximately 272 submitted completed, usable study instruments. The survey instruments included menus with Jack in the Box items, with the appropriate number of calories (for the experimental group), a choice of small, medium, or large when appropriate, and a brief survey about fast food attitudes and behaviors. The surveys were handed out at random to students in classroom settings. Half of the participants received menus with calorie information (the experimental group) and half received no calorie information (the control group). As a result, there was a 209.71 average calorie difference between those who received menus with calories and those who did not. We concluded that knowing calories of fast food can decrease the amount of calories ordered.

THE SOCIAL AND ENVIRONMENTAL HISTORY OF HUI/HAN RELATIONS AND LAND CULTIVATION ON THE LIUPAN PLAIN
Bahr, Logan; Wardrop, Margaret; Cmejla, Ben; Smith, April
Faculty Mentor(s): James Cook, History

Session: 1
Oral Presentation 9:10-9:30 in Room 135

Instability and political fragmentation during the late Qing and Republican periods resulted in Han-biased land resource distribution in the 20th century. Mao’s environmental policies overlooked important social and geographical inequalities, which accentuated land and water resource problems for people living in China’s northwest region. Through our research in southern Ningxia, we found that due to these historical inequalities, arable land and water resources are more available to Han villages than to Hui villages in Guyuan prefecture. The first ten years of the GWDS that aimed to modernize the northwest and boost agricultural and industrial production in the region has, in its target areas, proven a great success. However, the strategy’s initiatives mainly target regions with high production potential and neglect the development of mountainous, less productive agricultural regions containing much of Guyuan County’s Hui population. Central policy has inadvertently marginalized many Hui communities in Guyuan, increasing a historically large, living-standard disparity between Guyuan’s Hui and Han communities.
CONSTRUCTION OF SUPPORT DEVICES FOR USE IN THE FAR-INFRARED LASER LABORATORY

Bailey, McKinley
Faculty Mentor(s): Michael Jackson, Physics; Greg Lyman, Physics

Poster Session 2: 11:15-1:45 - Poster #18

In the far-infrared laser laboratory at Central Washington University, there are a variety of student projects currently being undertaken, ranging from the measurement of laser frequencies to the development of spectrometers for the investigation of stable molecules. To support these projects, several different devices were constructed, including a HV (high-voltage) voltage divider, a Teflon frame that holds two silver-coated glass plates in a vacuum chamber, and the preliminary assembly of a diffusion pump system for use with a liquid helium cooled detector. In this presentation, an overview of each of these projects will be discussed along with a display of the Teflon frame.

COOKING UP A NATION: FOOD, CULTURE, AND IDENTITY IN THE EARLY AMERICAN REPUBLIC

Bailor, Karen
Faculty Mentor(s): Daniel Herman, History

Session: 9
Oral Presentation 10:00-10:20 in Room 135

In the post-revolutionary period, Americans actively strove to distinguish themselves from their British backgrounds. One aspect of the culture that witnessed dramatic change during this period and beyond was the foodways of Americans, both common and genteel. From 1796 and into the early nineteenth century, the public discourse of food shifted to reflect changing values among the upper- and middle-class citizenry of the country. While American hearth, home, and table generally became more refined as the American people struggled for more respectable lives, the food that was served on those tables took on uniquely democratic values, embracing simplicity, equality, and a deep connection to the land. This paper will examine Post-Revolutionary American foodways as both a construct of and contributor to the development of an American national identity as well as a national culinary identity.

METAPHORIC STORIES IN FIELD SUPERVISION OF STUDENT TEACHERS

Ballou, Gary
Faculty Mentor(s): Gary Ballou, Education

Session: 36
Oral Presentation 3:00-3:20 in Room 137B

Please see the peer reviewed expanded abstract on page 147.
THE UNITED STATES, RUSSIAN LIVING RESOURCES OF THE BERING SEA - THE PRACTICALITY AND URGENCY OF JOINT MANAGEMENT OF TRANS-BOUNDARY RESOURCES

Barrow, Michael
Faculty Mentor(s): Rex Wirth, Political Science; Todd Schafer, Political Science

Session: 26
Oral Presentation 1:10-1:30 in Room 135

This paper looks back at recent attempts by the United States and Russia to jointly manage the trans-boundary migratory marine resources of the Bering Sea between Russia and the United States waters. The paper further examines the current dangers and obstacles to the United States fisheries resources that migrate into Russian waters and back to the United States waters. These threats will be shown to include over fishing and under reporting of catches by Russian fishing vessels, lack of transparency of the Russian management system, lack of dedication of sufficient funds by the Russian State to manage and protect these valuable resources, and the corrupt practices--within the allocation processes, the management processes and the enforcement processes. The paper will also examine the additional threat to these trans-boundary resources, that being the planned offshore and near-shore Russian oil and gas development in the Western Bering Sea and the Sea of Okhotsk. The paper will ask the question, “Has the United States policy for joint use, protection, and management of these trans-boundary living marine resources been the best policy for the interest of the United States.” It will be argued that the current United States-Russian Bering Sea policy is not in the best interest of the United States and does not sufficiently protect these trans-boundary resources. And finally the paper will explore and identify policies and practices that the United States should take with Russia to protect these resources for ongoing sustainability and at the same time, improve utilization opportunities.

TRANSITIONS
Barsotti, Melisa
Faculty Mentor(s): Therese Young, Dance

Session: 33
Oral Presentation 1:10-1:30 in Theatre

The piece I will be performing today is my own choreography titled Transitions. I began dancing when I was nine years old, first taking jazz, then ballet, and finally tap dance lessons. Tap has always been my favorite style of dance because I love the complex rhythms and inventiveness that can be used when creating movement. When I was eleven years old, my first and only tap teacher suggested that I compete a solo. Working with him was such an inspiration and through his guidance my skills increased tremendously. At eighteen, after competing five solos, I knew my competition days were about over--as I was preparing to leave for college. I decided to compete one last time and took the challenge of choreographing a solo for myself, personalizing the movement and rhythms that are in my piece. My inspiration came from all my years of competing, and never seeing anything tapped to instrumental music that stuck out to me. As you will see, there are many complex beats and measures that complement my accompaniment, but also defy the irregular beats throughout. This piece was performed in the Orchesis Spring Dance Performance last year in June, but having now tweaked the choreography, experimented with new rhythms, and cleaned my piece multiple times, I can finally take a deep breath, and say that I am a proud performer and choreographer, and hope that the audience will enjoy watching this piece as much as I enjoyed creating it.
The Washington State Department of Transportation recently initiated a major highway project to expand Interstate 90 over Snoqualmie Pass, Washington. The project will include the construction of wildlife crossing structures and replacement of existing culverts and bridges to enhance the movement of wildlife species across the highway. Several pre-construction surveys have been conducted between 2008 and the present to assess the highway's current impact on each of the nine fish-bearing streams in the project area. Treatment and control reaches were identified and delineated in each of the study streams. Treatment reaches included existing highway stream-crossing structures and control reaches were upstream in areas that were not influenced by existing stream-crossing structures. The stream health assessment includes aquatic macroinvertebrate sampling. During the summer of 2010, a Surber sampler was used to collect macroinvertebrates in the study streams by taking three samples at each treatment and control site. The samples were initially processed to separate the invertebrates (mostly insects) from debris and then separated by taxonomic Order and Family. Comparisons were made within and between streams with respect to invertebrate diversity and community structure. The description of the invertebrate communities will be used as baseline data to monitor any future changes within the communities following construction of new stream crossing structures.

A truss is a structural component of a building that holds up the roof loads used to span long distances. This project will find the forces of a truss in the CWU Student Union and Recreation Center and this will allow for a further structural analysis. The truss system in the Recreation Center above the gym was selected because it shows a visual demonstration of science in the real world. The truss analysis will use the method of joints and static analysis. The poster will illustrate the projected forces in the truss and how the weight is distributed. Illustrating the forces will build appreciation for the magnitude in a real-world problem.

Early environment and later depression may play an important role in adult alcohol abuse. An animal model of early environmental disturbance, termed maternal separation, has been shown to affect later alcohol consumption in adult animals. However, changes in adult drug intake are dependent upon the duration of daily postnatal maternal separation; short periods of separation (e.g., 15 min) result in lower alcohol intake in adulthood than do longer periods of separation (e.g., 180 or 360 min). The current proposal will investigate if differences in alcohol intake in adult animals that underwent maternal separation are due, in part, to altered sensitivity to specific alcohol responses, including alcohol-induced changes in anxiety and sedation.
LATINO POLITICAL PARTICIPATION AND REPRESENTATION IN THE PACIFIC NORTHWEST: THE CASE OF WAPATO, WASHINGTON (PART TWO)

Benham, Austin; Griffith, Jared; Kaskla, Kristian
Faculty Mentor(s): Gilberto Garcia, Political Science

Session: 34
Oral Presentation 3:00-3:20 in Room 135

Wapato, Washington presents an excellent opportunity to explore the levels of political representation and participation of a community in the Yakima Valley. Latinos constitute 76% of the total population, while the white only and American Indian population constitute 24% of the total population. Even though, the common pattern of Latina/o communities in the Pacific Northwest exhibits low levels of political representation, Wapato’s experience reveals high levels of representation from the city council members to the mayor’s position. This panel examines the factors which explain the high levels of Latina/o political representation in this small community and proposes a set of policies for the solution of low levels of Latina/o political representation. The panel participants explore various theoretical approaches on political participation and representation and their application to the experience of the Latina/o community, including the socio-economic status model, the civic volunteerism model, the structural context model, and the mobilization model. The study uses demographic data, city documents, and review of literature, library resources, and local newspapers in the examination of the political life of this small community in the state of Washington.

THE RAKIST

Bennett, Zachary; Rose, Kathryn; Kim, Paul; Devine, Crystal; Marshall, Joe; Lewis, Haley
Faculty Mentor(s): Michael Ogden, Film & Video Studies; Maria Sanders, Film & Video Studies

Session: 8
Oral Presentation 9:20-9:45 in Theatre

The short film The Rakist was created by The Motion Picture for the 2011 48-Hour Film Slam hosted by the Film and Video Studies Program. The object of this competition is to write, shoot, and edit a short film within a forty-eight-hour time period and present the final product to an audience. This short horror film received two awards: Best of Festival (audience award) as well as Best Director (judges award). Everyone in the group was involved in every aspect of this production from creation to submission of the finished film.

THE ROLE OF NITRIC OXIDE IN EXPERIMENTAL HOOKWORM INFECTION

Berndt, Amanda; McNutt, Sarah; Moesch, Stephanie
Faculty Mentor(s): Blaise Dondji, Biological Sciences

Session: 4
Oral Presentation 8:30-8:50 in Room 140

Hookworm infection is a major cause of anemia, malnutrition, growth delay, and cognitive defects in resource poor countries. Human and animal studies suggest that infection with these intestinal nematodes is associated with impaired cellular immunity, characterized by reduced lymphocyte proliferation in response to both parasite and parasite non-specific antigens. Spleen cells from infected hamsters secreted more nitric oxide (NO) in culture than did those from naïve animals. In order to further identify the role of NO in hookworm pathogenesis and pathology, we conducted experiments where the production of NO was inhibited using N-Monomethyl-L-Arginine (L-NMMA). Hamsters were infected with 100 third stage larvae L3 of the hookworm, Ancylostoma ceylanicum. Hamsters that received L-NMMA showed lower worm burden (4 + 2) at day 36 postinfection (PI). The worm burden in the control group, without L-NMMA was (21 + 4, p < 0.005). Flow cytometry analysis showed that hamsters receiving L-NMMA had higher proportion of CD4+ T-cells and surface IgG+ B cells than the control. The role of NO was also tested in partially immune hamsters that were infected with 75 L3. The group that received L-NMMA had lower egg count as from day 14 PCI to day 21 PCI. Anemia was assessed by measuring the hemoglobin levels. However, there was no difference in hemoglobin levels between L-NMMA group and the control group that did not receive the inhibitor. Together, these data suggest that NO modulates the clinical outcome of hookworm infection but its role in enhancing immunity is still to be determined.
Efficacy of Alcohol Education Programs

Biddle, Ryan; Farmer, Gail; Gabriel, Kara
Faculty Mentor(s): Kara Gabriel, Psychology

Poster Session 1: 8:30-11:00 - Poster #35

Underage drinking on college campuses signifies a large and growing problem in the United States. Data suggest that approximately thirty percent of college students meet the criteria for alcohol abuse compared to approximately five percent of the general population. Nationwide data also suggest that about forty-four percent of college students have engaged in binge drinking within a two-week period and twenty-three percent reported binge drinking more than two times in a two-week period. A current trend in alcohol education and interventions is to use personalized normative feedback and online interventions with entire classes of incoming freshman. E-CHUG is the most common personalized normative feedback and is used by over 250 colleges nationwide and data have shown great efficacy in making participants more aware of their own drinking patterns. Other in-person lecture format programs as well as online interventions are available for underage and high-risk students. This current study will investigate the efficacy of the Prime for Life program, an in-person lecture program, and the Under the Influence Program, an online based intervention. Archival data from the 2010-11 school years was collected and was based on student’s answers to a pre-and post-test that was integrated into both programs will be analyzed. Data will be analyzed to determine differences between pre and posttest questions as well as total scores for the in-person and online intervention programs in order to evaluate efficacy of both programs.

Science, Math, and Soggy Socks: Eighth Grade Pre-Algebra Students Investigate Water Quality in Selah, Washington

Bishop, Tiffany
Faculty Mentor(s): Michael Pease, Resource Management

Poster Session 2: 11:15-1:45 - Poster #35

The goal of the Yakima W.A.T.E.R.S. grant is to enhance interdisciplinary research in public schools along the Yakima River. The Selah project focused on integrating math and science in a community-based learning environment. Eighth grade pre-algebra students investigated three water samples sites (stormwater, groundwater spring, and industrial/wastewater effluent) for three variables (temperature, conductivity, and discharge) in three seasons (fall, winter, spring) in an effort to improve their understanding of data analysis while providing them an opportunity to gather data for real world application. Temperature data will be used by the city for DOE mandated regulation. ESA listed salmon inhabit local streams in which temperature acts as a limiting factor for spawning and rearing habitat of juvenile salmonids. This localized issue creates the opportunity for both interest and value for the participating students.
CHIMPANZEE RESPONSES TO VISITORS USING CHIMPANZEE-FRIENDLY BEHAVIORS
Bismanovsky, Daniella; Jensvold, Mary Lee
Faculty Mentor(s): Mary Lee Jensvold, Primate Behavior

Poster Session 3: 2:00-4:30 - Poster #41

The relationship between humans and non-human animals is a complex one that can have profound consequences on a non-human animal’s life, especially in a zoo setting. While few studies suggest that that zoo visitors have an enriching effect or no effect on the animals, many studies suggest that zoo visitors are a cause of stress. Among primates and non-primates, visitor presence can lead to an increase in pacing, aggressive displays, time spent non-visible to the public, and a decrease in overall activity. The use of camouflage netting, signage, and species-specific behaviors all have shown to be effective at reducing negative visitor effects. The current study tested the effectiveness of using species-specific behaviors among a group of captive chimpanzees at the Oakland Zoo in California. There were two conditions in this study: a control condition in which there were no differences to the enclosure, and an experimental condition in which the researcher was present asking visitors to use two chimpanzee-friendly behaviors: a stooped posture and a play face. Data was collected six days a week, over a period of three weeks, via videotape. Data coders recorded the behavioral contexts for each chimpanzee as they occurred on the videotape and the time that each context began. The chimpanzees spent significantly more time engaged in friendly behaviors with each other in the experimental condition when compared with the control condition. The results suggest that by encouraging visitors to use species-specific behaviors, zoos can reduce the negative impact that visitors have on captive animals.

INTERNATIONAL PERSPECTIVES ON SUSTAINABLE TOURISM: ECUADOR
Booth, Carina
Faculty Mentor(s): Kenneth Cohen, Recreation and Tourism

Session: 39
Oral Presentation 2:40-3:00 in Room 202

Sustainable tourism is an approach to tourism that has relatively low environmental and cultural impacts. The sustainable tourism movement has the potential to contribute to the economic development of a country while mitigating impacts on natural resources. Ecuador is the most bio-diverse country in the world and with such a claim, tourism is being promoted at the national level. Tourism can contribute irreversible damages to an ecosystem, culture and native peoples if not managed in a sustainable manner. Ecuador has designed a sustainable tourism plan that they hope to accomplish by 2020 to maintain biodiversity while promoting the local economy, culture and traditions. Is Ecuador adhering to the stated objectives of the sustainable tourism plan developed by the Ministry of Tourism and collaborative entities in the case study communities? In this multi-case study, through observation, immersion and narrative reflection, methods typically associated with the case study approach, the Strategic Plan for Sustainable Tourism Development in Ecuador (PLANDEPUR) was evaluated. The PLANDEPUR outlines the objectives to measure sustainable tourism in the country and it was analyzed through the methods above in communities in each of these three regions we visited to assess if the stated objectives were in fact implemented. A final portfolio was generated that synthesized the observations and reflections. PLANDEPUR is adhering to its stated objectives to implement sustainable tourism practices in Ecuador in promoting the local economy, traditions, and culture as well as protection of designated natural areas.
**NBA: THERE IS NO “I” IN TEAM**  
*Borromeo, Derek*  
*Faculty Mentor(s): Dominic Klyve, Mathematics*

**Session: 22**  
**Oral Presentation 12:20-12:40 in Room 201**

This research looks at statistics from the National Basketball Association (NBA), provided by databasebasketball.com, in an attempt to explain the important factors that are relative to determine wins in a NBA regular season by using advanced statistical methods. The hope of this project is to find evidence for or against the common person’s interpretation of an NBA season that winning basketball teams are determined by individual superstars. Since the purpose is to determine factors in the regular season, the playoff wins will be discounted. Using SPSS and Minitab to conduct statistical experiments, our goal is to find relationships between factors that may contribute to NBA wins. Factors include offensive field goals made and attempted, rebounds, turn-over’s, assists, points and defensive stats such as, steals, field goals made and attempted, and rebounds, etc. Other tests will be done across different years and different teams. The results may be obvious to some but astonishing to others. Teams with superstar players aren’t always the teams that come out on top, in fact, the teams that have balanced offense and defensive stats will win most of the time. The results will suggest that a team’s offensive performance is more important than its performance on defense. NBA analysts for decades have explained that defense always wins games but recently, the statement that many analysts make are how “a better offense always beats a good defense.” This project will provide data to contribute to this discussion.

**SHALL WE DANCE ACROSS CULTURES? CONSTRUCTING MASCULINITY IN JAPAN AND HOLLYWOOD**  
*Brand, Bevin*  
*Faculty Mentor(s): Liahna Armstrong, Film & Video Studies*

**Session: 18**  
**Oral Presentation 11:40-12:00 in Room 135**

Film is, like any art form, both a reflection of, and an influence on, the culture in which it is produced. The differences between a film produced in one country and a film produced in another can be an interesting insight into the cultures of both, particularly when both films tell the same basic story. The Japanese film Shall We Dance? was an enormous hit in Japan and challenged societal norms of acceptable masculine behavior. The Hollywood remake of the same title asserts a more conservative stance on appropriate masculine behavior and noticeably deviates from its Japanese counterpart on several key points. Using film theory and texts on Japanese culture, my paper is an examination of these deviations and why the Japanese film was able to defy popular convention and still achieve success while its American counterpart did not. This indicates a deep-seated insecurity in American culture in regards to masculinity and heteronormativity that is typically reflected in Hollywood cinema. Not only does it reflect in the media but the media can also reinforce these anxieties in the culture, reinforcing the rejection of anything that does not fit within the confines of that definition. My conclusion is that Hollywood is largely preoccupied with re-validating traditional modes of heteronormative masculinity while the Japanese do not have such a deep-seated anxiety about it and feel more comfortable challenging convention.
STEP SCIENCE SEMINAR: A PROJECT-BASED INTERDISCIPLINARY FRESHMAN SCIENCE CURRICULUM

Braunstein, Michael; Carnell, Lucinda; Ely, Lisa; Holt, Renee; Jackson, Michael
Faculty Mentor(s): Michael Braunstein, Physics

Poster Session 2: 11:15-1:45 - Poster #23

As part of CWU’s Science Talent Expansion Program (STEP), faculty from Physics, Geological Sciences, Biological Sciences, Chemistry, and Industrial and Engineering Technology departments have developed and implemented a freshman science curriculum, the principal goal of which is to lead students through a two-quarter process of proposing, executing, and reporting the results of independent, hands-on scientific investigations and engineering projects. The curriculum uses the topic of energy as the context for the projects, both because of its relevance to society and because it has proven sufficiently broad to inspire students to propose projects that address the range of interests and disciplines typically represented in the course. The principal content of the first quarter is integration of a broad introduction to energy and energy issues with instruction that leads each student through the process of developing and writing a proposal. Faculty select between ten and twenty projects from among all the proposals, based on their feasibility and how well they meet the course objectives. Students then prioritize their preferences from among this reduced set of projects and are assigned to groups of typically two or three students each. The second quarter of the course sequence is dedicated to executing and reporting results of the projects. Project summaries completed by the 2010-2011 STEP freshman cohort will be presented.

CONTEMPORARY WOODFIRE Kiln TECHNOLOGIES AND ESTHETICS

Brislawn, Ryan
Faculty Mentor(s): Stephen Robison, Art

Poster Session 1: 8:30-11:00 - Poster #44

I am focused on producing work that is centered on woodfired storage containers. I had the opportunity to build a train kiln, which is a woodfired kiln designed by Professor John Neeley at Utah State with modifications by Professor Stephen Robison. I then began making storage vessels to fire in the kiln. As I began making them, I found my focus narrow to vessels that deal with the fermentation of alcohol. This is oddly appropriate, for the oldest pots date back to when humans began to farm grain for the production of alcohol. The firing of a wood kiln is a collaborative effort, very much like the camaraderie entailed in social drinking. Through the process of woodfiring, I learned that I have some control over the surface of my vessels; however, I am also collaborating with the element in the wood and the force of the fire. The fire creates a record on the surface of the work with something called flashing. The way the ash from the wood source layers on the work to become a glaze also is partially in my control. As the ash forms a glass with the silica in the clay there is a third element to work with. Adding another layer to my work, I use low fire decals to create a connection with and old and new technologies. Through this process I am able to create utilitarian pieces that speak about traditional and contemporary issues.

SOLDIERS LANGUAGE, AND CULTURALLY SIGNIFICANT TERMS

Brouwer, Eric
Faculty Mentor(s): Kathleen Barlow, Anthropology & Museum Studies

Poster Session 3: 2:00-4:30 - Poster #1

Through the use of culturally significant terms United States soldiers shape the way they see indigenous people, and by doing so, affect the way they are viewed by local people. The research goal for this project was to understand how local terms become incorporated into the language of soldiers. Through the course of the research, my methods took several different turns. I discovered that my own prior service in the military did not automatically grant me access. I also learned that I could use my own experience as part of my research. Due to an inability to gain access to the military my research design went from large scale participant observation to individual life history via autoethnography. I describe some of these challenges and present examples of culture and language that I recognized through service by autoethnography. I display two examples of culturally significant terms that have been modified by soldiers. Greater dialog between anthropology and the military can promote better relations between the United States military and the field of anthropology and promote a larger understanding of the military by anthropologists and the military itself.
FTIR-ATR MEASUREMENTS OF POLYMER ADSORPTION TO TiO$_2$ SURFACES

**Bryce, David**

*Faculty Mentor(s): Dion Rivera, Chemistry*

**Session: 20**

**Oral Presentation 11:40-12:00 in Room 137B**

Polyelectrolytes play an important role in manufacturing and industry, as well as potential for use in water purification systems. In addition, they exhibit a wide range of behaviors which cannot be easily predicted. With the intention of generating a greater understanding of the interaction of Poly(sodium 4-styrene sulfonate) (PSS) with a titanium dioxide film in an aqueous environment, attenuated total internal reflection Fourier transform infrared spectroscopy was employed to measure absorbance due to PSS adsorption across a range of temperatures and concentrations. These PSS/TiO$_2$ interactions were observed with the hope of generating a model for uncomplexed activity of PSS on a TiO$_2$ surface which would then allow observation of any change which may occur due to the presence of surfactants in complex with the PSS during future experiments. Behavior of the PSS was observed across a range of concentrations and at temperatures ranging from room temperature (22º C) to 90º C. This data was then used to generate a concentration verses absorbance curve to allow observation of intensity changes in adsorption. These initial experiments exhibited an unexpected increase in absorptions at heightened temperature for concentrations between 8.4x10$^{-7}$ and 2.24x10$^{-6}$ molar which was unexpected, however, continued experimentation is required to confirm these observations.

POLYELECTROLYTE SURFACTANT COMPLEXES

**Buck, Kathleen; Agren, James**

*Faculty Mentor(s): Dion Rivera, Chemistry*

**Poster Session 1: 8:30-11:00 - Poster #11**

Anionic polyelectrolytes, when in solution with cationic surfactants, form polyelectrolyte-surfactant complexes (PSC). These PSCs display unique characteristics which have possible implications in the removal of water-soluble organic compounds. The goal of this research is to understand how these PSCs interact in the absence of water soluble organic compounds. A model system involving polysodium-4-styrenesulfonate as a polyelectrolyte, and cetylpyridiniumbromide as the surfactant was employed in this study with titanium dioxide (TiO$_2$) present to aid in the removal of the PSC from solution. The concentration of polyelectrolyte was held constant while the concentration of surfactant was adjusted over a range of 40 times greater than the polyelectrolyte concentration to 520 times the polyelectrolyte concentration. The range was then used to conclude at what point the PSC crashes out of the solution. To determine the amount of PSC that remained suspended in solution, ultraviolet-visible spectroscopy was used. Data from these results will be compared with an analysis, already completed in the research lab, involving the PSC interacting with organic compounds to help better understand how the polyelectrolyte surfactant complex interacts with the organic dye compounds in the presence of TiO$_2$.

STUDENT TEXTBOOK OPTIONS

**Butler, Jason; McClellan, Kyle; Johnson, Jody; Aalzainyuldeen, Fatimah**

*Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management*

**Poster Session 3: 2:00-4:30 - Poster #28**

The purpose of this research is to identify how students purchase textbooks and how students feel about their current purchasing options. We assume general displeasure with the current methods of buying textbooks, and would like to see how widespread this idea is. We plan to survey between 50 to 150 Central students. Since all students purchase textbooks, we should have no problem finding candidates. We will not include names with this survey, so anonymity will be preserved. We will be using www.surveymonkey.com as well as physical handouts amongst our peers. We hope to find general trends amongst those who have student aid, and those who charge books to their student accounts. This is a popular topic amongst Central students, and we would like to expose it to more public discussion.
SEXY-SON OR HANDICAP: TESTING TWO MATE CHOICE HYPOTHESES OF SEXUAL SELECTION USING THE BLACK FIELD CRICKET, GRYLLUS FIRMUS
Buxel-Florenzen, Stefanie; Sun, Lixing
Faculty Mentor(s): Lixing Sun, Biological Sciences

Session: 4
Oral Presentation 9:30-9:50 in Room 140

Sexual selection is an evolutionary process whereby traits in one sex evolve in response to selection by the opposite sex. Characteristics that influence an individual's choice of mates is one mechanism of sexual selection. In species where males only provide sperm (and not other benefits) to females, females must be picky about which males to mate with. The sexy-son hypothesis suggests that females choose males who are "sexy," because her sons would also be more attractive to females and produce more offspring. The handicap hypothesis proposes that females choose mates with some sort of handicap (like chirping ability, which might attract predators) because they must also be very fit to survive with this handicap. This study tests which of these two hypotheses is supported by data on reproductive fitness after 2 generations of breeding females with “attractive” and “unattractive” males. We used the black field cricket, Gryllus firmus, because it has short generational gaps, large numbers of offspring, and is easy to maintain in the lab. Paternity testing will be used to determine which sons of the original parents produced the most offspring. If attractive males produce more offspring, the sexy-son hypothesis is supported. However, if attractive and unattractive males produce equal numbers of offspring, then the handicap hypothesis is supported. Since these hypotheses have never been compared, the results of this study will provide a new understanding of female fitness, mate choice, and sexual selection.

HISTORICAL AND PRESENT ACTIVITY OF A LANDSLIDE NEAR NACHES, WASHINGTON
Calvin, Jacob
Faculty Mentor(s): Lisa Ely, Geological Sciences

Poster Session 2: 11:15-1:45 - Poster #14

This project has evaluated the patterns and potential causes of historic and current movement on a slow-moving landslide in the Naches River canyon. The landslide is 150 m wide by 300 m long, and is located 22 km northwest of Yakima, Washington. It consists of a steep scarp at the top and three ridges at the bottom, formed by rotational movement of the landslide. To understand its history, seven aerial photographs, ranging from 1927 to 2005, were evaluated. The greatest movement occurred between 1947 and 1968, and a faint ground crack on the 1927 photo alludes to a landslide origin around that time. Land use, river channel changes, and precipitation data were compared with the decadal-scale timing of landslide movements to determine factors that might have contributed to the land sliding. The precipitation data was the only factor to show a possible correlation. The major precipitation events from 1927 to present occurred in the 1950s, which was the time of greatest landslide movement. To assess current landslide activity, the site was monitored from 2007-2011 through eight resurveys of eleven marked points strategically positioned on the landslide. There appears to be a slight upward increase in the collective vertical position of the landslide ridges and an increase in the distance relative to the control point of several centimeters. The majority of the activity occurred over forty years ago, and the landslide seems to have only a small amount of current movement.
THE EFFECTS OF CAFFEINE ON 5K RUNNING PERFORMANCE FOLLOWING EXERCISE INDUCED MUSCLE SORENESS

Campbell, Stephanie; Pritchett, Robert; Pritchett, Kelly
Faculty Mentor(s): Robert Pritchett, Nutrition, Exercise, & Health Services; Kelly Pritchett, Nutrition, Exercise, & Health Services

Session: 40
Oral Presentation 3:00-3:20 in Room 271

Caffeine functions as an adenosine receptor antagonist by blocking pain reception. However, research is warranted to examine the efficacy of caffeine on delayed onset of muscle soreness (DOMS) after exercise. The primary objective of this study was to investigate the effects of caffeine on 5 km time trial performance following exercise-induced muscle soreness. A double blind counterbalanced design; seven recreationally trained male participants ingested either the placebo (5mg/kg) (PLB) or caffeine (5mg/kg) (CAFF) 1h prior to a 5 km time trial (TT). Muscle damage was induced by a 30 min downhill (-10%) treadmill run at 70% VO2max. Participants returned to the lab forty-eight hours later to complete 5 k TT. RPE was recorded every two min during each minute the TT. A repeated measures ANOVA (treatment x time) was used to analyze dependent measures. Results indicated no interaction for the treatments (PLB, CAFF) across time for RPE, or heart rate. No significant difference was detected for 5 k performance between trials (1014.5 +64.5sec vs 1017.6 +- 63.55 for CAFF and PLB, respectively). These findings of similar physiological responses between trials suggest that caffeine has a limited ergogenic affect after severe muscle damage on subsequent sustained maximal exercise performance.

CAPE & THE COWL; VIGILANTISM IN POPULAR CULTURE AS AN INVERSE THEORY OF CIVIL DISOBEIDENCE

Candella, Jimmy-Dean
Faculty Mentor(s): Alain Beauclair, Philosophy

Session: 2
Oral Presentation 8:30-8:50 in Room 137A

By approaching the realm of popular culture, with particular emphasis taken towards the characters of the Batman, the Punisher & Dexter Morgan, the application of vigilantism will be shown to not only be a distinctly American philosophy regarding the state, but also come to serve as a dark reflection of the writings of Henry David Thoreau on civil disobedience. Lacking a literary classic for the American culture, this topic will bring insight to the adoption of vigilantism, with prominence taken towards the market of children, by our heroes in print, as well as discuss our nation’s secret love for those who would engage in its practices. The presentation will end with an examination of contemporary citizens enacting vigilantism, and the culminating factors which led to such a redefining of their moral characters.
GIS JOB MARKET
Cannon, Jamie; Hickey, Robert
Faculty Mentor(s): Robert Hickey, Resource Management

Poster Session 2: 11:15-1:45 - Poster #24

There is a need for Geographic Information Systems (GIS) professionals in the current workforce. In diverse fields such as urban and resource planning, engineering, geography, geology, farming, recreation, health and medicine, and business and marketing, GIS job opportunities are available for the entry level technicians as well as senior level manager positions. Both private companies and government agencies offer a wealth of GIS job opportunities, including many types of military positions. This research surveyed 283 GIS job positions in the United States on the internet. Job positions selected in this analysis were primarily found on websites with the greatest ease of access and information gathering, although many types of job-posting websites were visited. Each job posting provided some degree of information describing the job type, education and/or experience needed, and the job sector. Only twenty-three of the total jobs provided information specific to common salary distributions, however; this may suggest a general trend between low and high salary ranges. Data was compiled in MS Excel to reveal qualifications for certain types and salary levels of job positions, with respect to experience, education, and specific skills needed to be eligible for jobs in several professional fields that are showing an increasing need for GIS expertise. The most common job positions found in the research were those describing analysis needs and proficiency. Analysis positions often required different software experience than GIS programming/developing positions, which suggest that subject matter within an undergraduate degree may assist with increasing job options for a future GIS professional.

LIGHTING THE COUNTRY WIFE
Carter, Andrew
Faculty Mentor(s): Christina Barrigan, Theatre Arts

Session: 18
Oral Presentation 12:20-12:40 in Room 135

A brief look at the lighting design for Central Theatre Ensemble’s production of The Country Wife, this presentation will look at the process the lighting designer took from the first reading of the play to opening night. This will include a look at the research the designer did for The Country Wife, as well, a look into the collaborative process that is theatre.

LIGHTING THE FASHION ODDITY
Carter, Andrew
Faculty Mentor(s): Christina Barrigan, Theatre Arts

Session: 18
Oral Presentation 12:40-1:00 in Room 135

This presentation will look at the lighting design done for Fashion Oddity, an annual fashion show co-produced by the Department of Family and Consumer Sciences’ Fashion Merchandising program and the Central student chapter of the United States Institute for Theatre Technology. The lighting design was submitted and presented at the Region 7 Kennedy Center/ American College Theatre Festival in February, and returned with the Regional Level 2 Lighting Design Award. The presentation will look at the similarities and differences between a traditional theatrical lighting design and lighting for a fashion show.
EFFECT OF HIGH FAT DIET AND DEFICIENT NICOTINAMIDE NUCLEOTIDE TRANSHYDROGENASE IN THE PRODUCTION OF ATP IN C. ELEGANS
Carter, John
Faculty Mentor(s): Carin Thomas, Chemistry; Lucinda Carnell, Biological Sciences
Poster Session 1: 8:30-11:00 - Poster #18

Type 2 diabetes is a worldwide epidemic affecting over 246 million people, but the cellular mechanisms that initiate the disease are still unclear. Recent research indicates that there may be a link between mitochondrial dysfunction and type 2 diabetes. The aim of this work was to investigate the role of a mitochondrial enzyme, Nicotinamide Nucleotide Transhydrogenase (NNT-1), in maintaining mitochondrial function in Caenorhabditis elegans exposed to high-fat diets enriched with stearic and oleic fatty acids. The nnt-1 mutant worms lack functional NNT-1 protein in their mitochondria. These worms are highly susceptible to damage via free radical oxidation as NNT-1 produces NADPH, which is used for free radical detoxification. Previous results have suggested that NNT-1 plays a role in maintaining mitochondrial respiratory function and that a high saturated-fat diet increases mitochondrial dysfunction via increased ROS production. In these studies we investigated the effect of high fat diet and deficient NNT-1 status on ATP levels in two strains of C. elegans, including a wild-type and an nnt-1 mutant. The worms were grown on high-fat and normal diets until adulthood and ATP was measured by luminescence. Our preliminary data show that there are no significant differences in ATP levels in the nnt-1 worms between the different fat diets. The data also suggests that the wildtype N2 worms are susceptible to the effects of the fat diets as the ATP levels drop for the N2 worms grown on the high fat diets.

THEY CALL IT DEMOCRACY: REPUBLICAN GOVERNMENT IN EUROPE, CHAPTER 1: HISTORICAL CONTEXT AND POLITICAL CULTURE
Caryl, Benjamin
Faculty Mentor(s): Rex Wirth, Political Science
Poster Session 1: 8:30-11:00 - Poster #26

This will be a poster presentation using the conceptual frame work for “Chapter 1: Historical Context and Political Culture,” from the student generated text They Call It Democracy: Republican Government in Europe. The poster demonstrates how similar growth patterns and degrees of accessibility in European state histories lend to congruence in present political cultures. It will consist of four tables: (1) growth patterns and democratization, (2) accessibility and democratization, a synthesis view in (3) growth patterns and accessibility and (4) political culture. The four charts will provide the basis for the topics of focus in the following chapters in They Call It Democracy: Republican Government in Europe. The overall presentation will illustrate how historical similarities create congruence in political culture.

IRON IN SOOT: REACTIONS IN THE TAIL PIPE
Casique, Hector
Faculty Mentor(s): Anne Johansen, Chemistry
Session: 11
Oral Presentation 10:00-10:20 in Room 137B

The automobile is the single greatest polluter, as emissions from a billion vehicles in use add up to a planet-wide problem. During fossil fuel combustion, impure carbon particles, also called soot, are formed along with other byproducts. Impure carbon particles contain organic molecules, such as Polycyclic Aromatic Hydrocarbons (PAHs) and a slew of trace metals, the most predominant of which is iron. Despite indications that oxidized PAH derivatives and reduced iron species are known to contribute to soot toxicity, not much is known about how these are produced during combustion. The purpose of this research is to study model iron-soot systems under conditions encountered in the tail pipe, to increase our understanding of the iron redox processes that occur before soot is emitted into the environment. Particular focus is on iron (Fe) speciation which is analyzed spectrophotometrically.
THE EFFECTS OF ALCOHOL AND MATERNAL SEPARATION ON SOCIAL INTERACTION IN ADOLESCENT MICE
Chambers, Kayla; Hoang, Melissa
Faculty Mentor(s): Kara Gabriel, Psychology

Poster Session 1: 8:30-11:00 - Poster #33

In human adolescents, decreases in social anxiety are reported to be one of the desired effects of alcohol consumption, and studying animal models allows the investigation of how early environmental stressors can contribute to such effects. In the current experiment, the influence of low doses of alcohol on social interaction in adolescent mice were studied in animals that had experienced varying lengths of postnatal maternal separation in order to investigate if adolescent mice show increases in social interaction following low alcohol doses and if early environment (i.e., maternal separation) can contribute to or attenuate alcohol's effects. Following preweaning maternal separation procedures, mice were injected with either saline or 0.5 g/kg alcohol (ip; 20% v/v), placed in isolation for twenty minutes, and then allowed to interact with a naïve same-sex novel companion mouse for ten minutes. Social behaviors were recorded and later coded for the test animal, including nose contact with the companion mouse, other body contact, and vertical climbing onto the non-test companion animal. Each 10 min session was broken into two min blocks for analysis of changes over time. While social behavior changed over the session, analysis of alcohol effects on social interaction showed a marginal trend in body contact in the beginning segments of the test trials. These preliminary results suggest that such mouse models may provide researchers with the ability to better investigate the effects of early environment on alcohol responses in adolescence.

UNIVERSITY BRANDING: THE ROLE OF INTERCOLLEGIATE ATHLETICS
Chandley, Josh
Faculty Mentor(s): Jeff Stinson, Management

Session: 22
Oral Presentation 11:40-12:00 in Room 201

Little solid empirical work has examined institutional returns associated with the investment in athletic programs. While the intangible effects are commonly cited, such as athletics serving as the “front porch” of the institution, direct examination of the effects of athletic programs has often been narrow in scope. The study seeks to assess the relative contributions of investment in athletics, compared to other areas of institutional investment, on important institutional outcomes. Data for the study was collected primarily from two datasets, the Integrated Postsecondary Education Data System (IPEDS) and the Equity in Athletics dataset, as well as archived materials such as US News. Models were created to measure the effects of athletic expense and athletic subsidy per full-time-enrolled (FTE) student on core revenues per FTE, gift revenues per FTE, total applicants, and the graduation rate. The models for athletic subsidy per FTE proved not to be statistically significant for any of the four dependent variables; however, three of the four variables were impacted in a statistically significant way by athletic expense per FTE. The main conclusion of this analysis is that athletics generates a significant return for the institution. Considering only core revenues and gift revenues, a $1 increase in athletic expenditures per FTE brought back an estimated $2.26 to the institution. Not only is there a financial return for the institution, but graduation rates also increased, meaning that athletics helps the institution meet its goals, as well as generate a financial return.
ELECTRIFYING BEHAVIOR: UNDERSTANDING THE NEURAL BASIS OF ELECTROTAXIS IN C. ELEGANS

Chrisman, Steven
Faculty Mentor(s): Lucinda Carnell, Biological Sciences

Poster Session 3: 2:00-4:30 - Poster #17

Electrotaxis is a behavior by which organisms migrate towards one end of an electric field. In the roundworm, Caenorhabditis elegans (C. elegans) electrotaxis produces a robust behavioral response to an electric field stimulus in which worms will orient and travel in a straight uninterrupted path directly towards the negative pole of a DC electric field (Sukul and Croll 1978). In addition, two novel electric field responses in C. elegans have been uncovered in our studies: an initial increase in velocity to field stimulus, and an immediate reversal with a decrease in field strength. In examining the neural basis for this behavior we have identified a mutant, eat-4, defective in a transporter that packages glutamate into synaptic vesicles; that is severely disrupted in all three aspects of electrotaxis behavior: velocity, direction sensing, and reversals. The EAT-4 protein is localized to a subset of sensory neurons in the head of the worm. Use of gene therapy to replace the defective eat-4 gene with a normal gene in select sensory neurons has revealed a role for the amphid sensory neuron (AWC) in both velocity and sensing direction, but not in reversal behavior. Further testing of mutant worms has identified a subset of neurons that connect to the amphid sensory neurons to control electrotaxis behavior as well. This work has shown that electrotaxis in C. elegans consists of a neural circuit with multiple sensory neurons, interneurons and motorneurons. This behavior may provide a valuable insight into sensory integration of sensory stimuli into motor behavior.

QUALITY OF SAFEWAY INC.

Chueh, Wei Ting
Faculty Mentor(s): Kun Liao, Finance & OSC

Lynnwood Center Poster Session - Poster #1

Through media, Internet, interviews, and personal thinking, alternative solutions of a research question on risk management in the operation and distribution of Safeway Inc. were discovered in terms of optimizing value in order to provide higher quality products and services to communities and also satisfy customers’ needs. How the Department of Risk Management provides advance and immediate solutions to current problems and also unexpected environmental changes including rising fuel prices, disaster, and economic recession, will be critical to the entire operation of the company as well as the quality of products and services the company provides to customers.

LATINO POLITICAL PARTICIPATION AND REPRESENTATION IN THE PACIFIC NORTHWEST: THE CASE OF WAPATO, WASHINGTON (PART ONE)

Clemons, Conner; Rich, Brian; Rosas, Uriel
Faculty Mentor(s): Gilberto Garcia, Political Science

Session: 34
Oral Presentation 2:40-3:00 in Room 135

Wapato, Washington presents an excellent opportunity to explore the levels of political representation and participation of a community in the Yakima Valley. Latinos constitute 76% of the total population, while the white only and American Indian population constitute 24% of the total population. Even though, the common pattern of Latina/o communities in the Pacific Northwest exhibits low levels of political representation, Wapato’s experience reveals high levels of representation from the city council members to the mayor’s position. This panel examines the factors which explain the high levels of Latina/o political representation in this small community and proposes a set of policies for the solution of low levels of Latina/o political representation. The panel participants explore various theoretical approaches on political participation and representation and their application to the experience of the Latina/o community, including the socio-economic status model, the civic volunteerism model, the structural context model, and the mobilization model. The study uses demographic data, city documents, and review of literature, library resources, and local newspapers in the examination of the political life of this small community in the state of Washington.
UNEMPLOYMENT  
Conaway, Andrew  
Faculty Mentor(s): Dominic Klyve, Mathematics

Poster Session 1: 8:30-11:00 - Poster #23

This study consists of an analysis of unemployment data. My goal is to find some connections to unemployment that could help explain the data and the rising trend of unemployment. A secondary goal is to forecast future unemployment statistics by extrapolating recent trends. This is important because unemployment greatly affects everyone. Even if an individual is employed, the government is still paying taxpayer money to those who are not employed, when those resources would be better used if allocated to other things. The methods used for analyzing the data include the use of statistical software such as Minitab and SPSS. These programs were used to perform multiple regression, explore the data, and run ANOVA. This will also help create a visual representation of the data, so the trends are easier to see. The data under consideration was collected by The Bureau of Labor Statistics, and consists of data from 1940 to present. The data set mostly consist of information on employed persons, unemployed persons, and people not in the work force. Data was also used from the Bureau of Labor Statistics to see how other variables, such as minimum wage, multiple jobholders, and union affiliations, affect unemployment over time.

CIVIL RELIGION IN “CLOUDY WITH A CHANCE OF MEATBALLS”  
Conrad, Jay  
Faculty Mentor(s): Jeffrey Dippmann, Film & Video Studies

Session: 18  
Oral Presentation 12:00-12:20 in Room 135

This presentation provides an analysis of the animated movie “Cloudy with a Chance of Meatballs” in terms of familial relationships, individuality, the American “can do” spirit and inventiveness, and how it depicts common cinematic themes of scapegoating and mimetic desire as defined by philosopher Rene Girard.

TYPE IT LIKE YOU MEAN IT: AN ANALYSIS OF USES AND ABERRANT USES OF CHAT FUNCTIONS IN MMORPGS  
Conrad, Jay; Jackson, Steve  
Faculty Mentor(s): Steve Jackson, Communication; Michael Ogden, Film & Video Studies

Session: 23  
Oral Presentation 12:40-1:00 in Room 202

An analysis of the most common uses and aberrant uses of chat functions within the LOTRO online gaming community, and the ways in which these uses cause changes within the game, including changes to culture, language, person-to-person interaction, aggressive behaviors, and role playing. Detailed samples of chat sessions are examined and analyzed for their more universal implications, and aberrant uses are discussed within the lens of psychology in terms of expression of aggression and ties to enactment of aggressive behaviors. All data was collected over time through detailed observation, as one would find in a cultural or anthropological study.
**HAMMER TIME**  
*Conrad, Jay; Odinzoff, Travis*  
*Faculty Mentor(s): Michael Ogden, Film & Video Studies; Steve Jackson, Film Studies*

**Session: 42**  
**Oral Presentation 3:20-3:40 in Theatre**

In *Hammer Time*, a dark comedy, two brothers, John (played by John Games) and Bryan (played by Ryan Head) attempted to get famous by emulating two Eastern-Euro brothers from the early 1990s that killed people with a hammer and video taped it. They bring Arnold onto the crew (played by Jake Bosma) to video tape and begrudgingly accept Rachel's (played by Kelley Pierre) presence as they try to attack various community members (including their own mother) and fail miserably, desperately trying to get famous. Featuring custom music by nerdcore group Power Lifter.

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**PRECIOUS GEMS**  
*Cook, Lindsay*  
*Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences*

**Poster Session 2: 11:15-1:45 - Poster #1**

**PURPOSE:** This garment was designed for a cohesive spring collection reflecting inspiration of gemstones and my interpretation. Turquoise is a stone that the ancient Egyptians used in their jewelry. It is known as the day stone, and is worn for strength, and protection from harm. This specific garment could be worn to a summer wedding, party, or to a fancy lunch.  

**PROCESS:** I initially created the garment and didn’t like the end result with the fabric I had used. On a field trip to Fabric Depot in Portland, I was inspired by different fabric and decided to go a completely different direction. In choosing a new fabric I was also moved to add new accessories to complete the overall look. The combination of the asymmetrical design, new fabric and accessories gave the overall look I was striving to achieve and I am much happier with the final product.  

**TECHNIQUE:** The garment was created using the draping technique. Princess seams in the front and the back were used to accentuate and flatter a woman’s body. The draping was then trued, a sample was made, fit to the model, alterations to the pattern were made and the final product was constructed.  

**MATERIALS:** 100% cotton exterior, polyester lining, invisible zipper. This is one in a line of three garments; the entire line can be seen at the 15th annual fashion merchandising spring fashion show, *Revolution*, June 4 at 3p.m. and 7p.m. in Milo Smith Theatre, McConnell Hall.

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**STATISTICS AND SMALL BUSINESS**  
*Cox, John*  
*Faculty Mentor(s): Dominic Klyve, Mathematics*

**Session: 30**  
**Oral Presentation 1:50-2:10 in Room 201**

A small business which only has a few stores must be able to keep all of its branches in check. The business must take care not to let prices fluctuate too much between its different branches, and they must make sure that no store dips too low in terms of net profit or sales. For a small Durable Medical Equipment (DME) retailer, some of the main items sold are items such as wheelchairs, beds, and CPAP machines. The cost for a DME retailer to buy one of these items can fluctuate, and the selling price varies depending on insurance; if the prices vary too much, then it can hurt the bottom line of the company. For our study, we compare three different storefronts of the same business, each located in a different city. Items compared include those mentioned previously, as well as many others. Using the method of ANOVA, we will investigate whether any of the three stores is generating a significantly higher or lower amount of profit than the other two. These results can be used by the business to evaluate differences in the three stores and make positive changes which will help them succeed in both the long and short term.
A CRITICAL ANALYSIS OF TRANSFORMATIONAL LEADERSHIP AND TRANSPERSONAL LEADERSHIP

Coy, Mary; Lupton, Natalie
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management

Poster Session 3: 2:00-4:30 - Poster #25

Burns’ Transformational Leadership Theory (1978) has transformed organizational behavior with an approach to leadership and followership designed to positively create a change in employees’ lives. Bass expanded Burns’ theory by introducing the four components of leadership now widely applied in business environments. The four components are individualized consideration, intellectual stimulation, inspirational motivation, and idealized influence. Most recently, Chopra introduced a leadership approach in which a leader can learn to look and listen at four levels: the level of observation, the level of analysis, the level of emotions, and the level of deeper consciousness (2011). This critical analysis contrasts Burns’ Transformational Leadership Theory (1978), Bass’ expansion of that theory, and Chopra’s transpersonal leadership approach (2011). Practical applications of Chopra’s approach are explored.

THE FACH SYSTEM IN OPERA

Curia, Angela
Faculty Mentor(s): Bret Smith, Music

Session: 27
Oral Presentation 2:10-2:30 in Room 137A

This presentation is on the subject area of music, specifically vocal performance in opera. I will explain the Fach system for categorization of operatic roles, and discuss singers that have defied it, questioning the necessity and validity of it and discuss the use of the system’s implications on issues of gender equality, sexism, ageism, racism, as well as issues of employability for singers. This research is relevant for audiences, casting directors, vocal pedagogues and singers to develop a greater understanding on the subject and, ideally, allow more flexibility in the use of the system. The main body of evidence used was specific female operatic singer’s biographies over the course of the past two centuries. The conclusion I have come to is that more research needs to be done on discrimination in casting for opera performances and the physical limitations of the human voice in order to gain a greater understanding on the validity and necessity of the Fach system, and hopefully allow more flexibility for singers in the future.

BLOOM

Davis, Kaitlin
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Poster Session 2: 11:15-1:45 - Poster #2

Purpose: I wanted to create a dress that is fun and flirty, but keeps an active lifestyle in mind. The goal was to have a garment that was less structured to allow for free and easy movement. An active lifestyle is important to me and I want clothes that represent that. The dress is simple, but endearing and comfortable at the same time. I added the flower accent on the bust which gives the dress a bit of a floral feel. Process: I started researching for ideas all around me but my inspiration for my final garment didn’t come until the class went on a field trip to Fabric Depot in Portland. I found a deep purple jersey knit and thought it would be terrific for a simple and comfortable dress that could be worn anywhere. The final style also allows the wearer free and easy movement, which is key for the active lifestyle. Techniques: This dress was created with a draping technique and has a sweetheart neckline that is held in place with elastic. Materials: Cotton jersey knit, elastic This is one in a line of three garments. The entire line can be seen at the 15th annual fashion merchandising spring fashion show, Revolution, June 4 at 3p.m. and 7p.m. in Milo Smith Theatre, McConnell Hall.
THE EFFECT OF CaN ON EARLY AXON GROWTH IN DEVELOPING CHICKEN EMBRYOS

Davis, Jessie; Schultz, Kaytlyn; Jull, Ronae
Faculty Mentor(s): Daniel Selski, Biological Sciences

Poster Session 3: 2:00-4:30 - Poster #7

We are exploring axon growth in the brain of developing chick embryos. Specifically, we focus on the retinotectal system, in which neurons from the retina (in the eye) extend axons to the optic tectum. Axon growth is observed in the retina and specifically measured in the optic fiber layer of the tectum. The intracellular protein Calcineurin (CaN) has been shown to be important in the development of immune cells and mediation of signals from cell-surface receptors in developing neural systems. We hypothesize that by inhibiting CaN, fewer axonal connections between the retina and the tectum will be formed. CaN inhibitors potentially block intracellular signals arising from receptors on the surface of retinal axons. These signals are blocked during the axon outgrowth and target recognition stages of axon development in chick embryos. Axon growth is then compared between the CaN-inhibited embryos and control embryos. By injecting a fluorescent dye into the eye of the embryos during the target recognition stage, axon growth can be visualized. With a fluorescence microscope, both retinal and tectal axons can be detected in the chick embryos. Particularly, the area of fluorescently labeled neurons in the retina is compared to the extent of labeled axons measured in the tectum. In preliminary studies, we have seen that inhibition of CaN expression leads to fewer axonal connections between the retina and the tectum of the developing chick embryo. A large number of replicates have recently been performed and are currently being analyzed.

EVIDENCE FOR MENSTRUAL SYNCHRONY IN CAPTIVE CHIMPANZEESE

Davis, Amanda; Leeds, C. Austin; Jensvold, Mary Lee; Fouts, Deborah
Faculty Mentor(s): Mary Lee Jensvold, Primate Behavior

Poster Session 3: 2:00-4:30 - Poster #43

The existence of menstrual synchrony in humans is debated, but social proximity does seem to positively correlate with this phenomena. Female free-living chimpanzees spend relatively little time together and have a lack of menstrual synchrony. We hypothesized that chimpanzee who live in close proximity may cycle synchronously like humans. We examined menstrual synchrony in three captive female chimpanzees over two non-concurrent years. In the first year Washoe and Tatu ($r = -0.259, p < 0.5$) and Tatu and Moja ($r = 0.280, p < .05$) exhibited a significant correlation in their cycles. In the second year Washoe and Tatu ($r = 0.161, p < .05$) and Moja and Washoe ($r = 0.262, p < .05$) exhibited a significant correlation in their cycles. Results show evidence for menstrual synchrony in captive chimpanzees; however, a larger study population should be examined for future studies.
RAPID DETECTION OF LACTIC ACID BACTERIA AND ACETIC ACID BACTERIA IN WINE
De Rosa, Antonio
Faculty Mentor(s): Holly Pinkart, Biological Sciences; Gabrielle Stryker, Biological Sciences; Jim Johnson, Biological Sciences

Session: 29
Oral Presentation 1:10-1:30 in Room 140

Washington State is the second largest wine producer in the United States, producing over 20 million gallons of wine annually and having an economic impact of over $3 billion. Biological spoilage of wine can lead to significant economic loss. Currently, no technology exists for the rapid and inexpensive detection of wine spoilage organisms. The purpose of this project is to develop a method to rapidly and inexpensively detect and quantify spoilage bacteria in wine. This project aims to develop an antibody-based technique and DNA probes (similar to those used in medical offices for the detection of bacteria that cause “strep throat” and “MRSA”) in a format suitable for use by local wineries. Two molecular biology techniques will be employed: Enzyme-linked immunosorbent assay (ELISA) and Fluorescent in-situ hybridization (FISH). ELISA is an assay that uses antibodies produced by mice to detect species-specific surface structures, and FISH detects species-specific DNA sequences. These techniques will be used to detect and quantify ten species of spoilage bacteria in wine. Initial data indicate a weak antibody response by the mice to Lactobacillus plantarum; attempts to boost antibody response are in progress. Fluorescent DNA probes are currently under construction, and preliminary data will be presented. Once appropriate antibodies and DNA probes are verified, they will be incorporated into a paper strip format for “dipstick” type assessments of contaminated wines.

THE ASSESSMENT OF SCHOOL PROGRAMS AND THE OUTCOME ON STUDENTS OF COLOR GRADUATION RATES
Delgado, Arlene
Faculty Mentor(s): Nelson Pichardo, Sociology

Session: 14
Oral Presentation 10:00-10:20 in Room 202

This study analyzes programs offered by schools and their influence on students of color graduation rates. It looks at the possible existence of a positive/negative correlation between school programs and the graduation rates among students of color within Washington State. Also, it conducts a comparison among school districts that fall under being defined as urban, suburban, or rural, and concludes whether there is a distinction among graduation rates between diverse school districts. The first stage will consist of an extensive literature review that provides statistical and factual information on school systems, students of color, school programs, and students of color scholastic rates. The second stage will provide statistical data to categorize the school districts (urban, suburban, or rural) and identify the school programs and percentage of students of color that the school districts encompass. The third stage will provide a randomized list from the three geographical categories and construct a final representation list that bestows statistical evidence whether school programs correlate with students of color graduation rates. It is projected that the literature review and collection of data will provide a greater sense of understanding whether school programs do promote equality of opportunity in all school districts, no matter deviating factors.
THE COOPTATION AND APPROPRIATION OF AMERICAN INDIAN SPIRITUALITY
Denner, Melissa
Faculty Mentor(s): Delores Cleary, Sociology

Session: 14
Oral Presentation 10:20-10:40 in Room 202

The practice of Native American spirituality by non-natives is controversial and is considered by some to be co-opting, or appropriating, traditional sacred ceremonies which belong to the “original people” who created them. My research will attempt to answer the question of ownership, or, in other words, “can spirituality be owned” and to get a first-hand understanding of what American Indian people believe about non-native participation in American Indian spirituality. The methodology used is qualitative and exploratory through open-ended, face-to-face interviews. It would appear that while traditionally, native people are inclined to share their spirituality or life ways with others, due to inter-generational trauma experienced by American Indians through a long history of genocide, there is today fear, concern, and a generally protective nature about the sharing of native ways, especially in spiritual matters.

QUANTITATIVE HISTOLOGICAL ANALYSIS: CALCINEURIN’S ROLE IN THE DEVELOPING RETINA
Dickerson, Andre; Godinez, Maria; Selski, Daniel
Faculty Mentor(s): Daniel Selski, Biological Sciences

Poster Session 3: 2:00-4:30 - Poster #9

The visual system is commonly used as a model for analyzing connections among developing neurons, the specialized cells that make up the nervous system. The specific neurons in this study are called retinal ganglion cells which consist of a cell body in the retina of the eye; and an axon which extends to the tectum, a specialized visual information processing part of the mid-brain that receives signals from the retinal ganglion cells. Calcineurin is a protein phosphate and intracellular protein that plays a role in axon growth (Mulero et al. 2009). In order to test calcineurin’s role in retinal ganglion cells axon growth, fertilized chicken embryos are removed from their shell and placed into incubators and treated with calcineurin inhibitors Tacrolimus (FK 506) and Cyclosporin A (CsA). Treatments were administered during the embryonic stages when axon growth is most active; embryonic day 5-9. We hypothesized that the axon layer of the retina within the FK 506 and CsA treated embryos will be thinner than the control embryos due to inhibitory effects of the drugs. We anticipated these finding due to previous work in our lab, calcineurin inhibitors appear to have the capacity decrease axon growth. Histological analysis measuring the thickness of axon layers within the retina was conducted comparing the thickness between the treated and control embryos. Our preliminary findings show that there was less axon growth in the optic fiber layers of the FK 506- and CsA- treated embryos when compared to the thickness of control embryos.
COUPLING INTERTIDAL COMMUNITY SURVEYS AND MANAGEMENT STRATEGY EVALUATIONS TO ASSESS THE EFFECTIVENESS OF MARINE PROTECTED AREAS IN THE PUGET SOUND, WASHINGTON

Dilworth, Erin

Faculty Mentor(s): Anthony Gabriel, Resource Management; Michael Pease, Resource Management; Cinde Donoghue, Washington Department of Natural Resources

Poster Session 2: 11:15-1:45 - Poster #25

Marine Protected Areas (MPAs) in Washington State aim to conserve delicate or unique marine or estuarine species, habitats, and culturally valuable sites, boost fisheries biodiversity and abundance, and provide educational and recreational opportunities. Widespread approval and implementation of MPAs has been hindered because their applicability as an effective management instrument has been questioned due to a lack of post-implementation monitoring and evaluation. The purpose of this research was to determine if protection level, and/or management policies and practices are effective at enhancing the biodiversity of MPAs in the Puget Sound. During the summer of 2010, MPAs of varying degrees of protection, along with adjacent control sites were surveyed for intertidal invertebrates and vegetation using 20-foot belt transects and quarter-meter quadrats. A total of 67 species were found across the various beaches. Comparisons between MPAs and their adjacent control sites were made using the Jaccard coefficient, Sorenson coefficient, percent similarity, and the coefficient of community. Simpson’s index was used to calculate a biodiversity index for each site. Management policies and practices for each MPA were also studied, and scored on a numerical scale using a variety of evaluative criteria. Comparisons of the resultant similarity coefficients, biodiversity indices, and management scores were statistically analyzed between protected and non-protected control sites, and between MPAs of differing levels of protection. These comparisons highlight deficiencies in management protocols at sites with comparably low biodiversity, and are a means to administer sites more effectively while achieving a conservation goal of enhanced biodiversity.

USING BRAIN IMAGING TO DETECT DECEPTION: A REVIEW OF FMRI AND EEG STUDIES

Dodgen, Lisa

Faculty Mentor(s): Ralf Greenwald, Psychology

Session: 31
Oral Presentation 1:30-1:50 in Room 202

Lying and deception are characteristics of a developed and sophisticated being and it has been found that there is a relationship between an organism’s neocortical volume and its ability to use tactical deception. Primates that are evolutionary closest to humans are observed participating in tactical deception more than other species. Thus, deception is found to be an evolutionary advantageous behavior. Accurately detecting deception in the human brain could have important implications in forensic settings, memory research, and brain mapping. Functional magnetic resonance imaging (fMRI), electroencephalography (EEG), and event related potentials (ERPs) have been used in recent deception detection research. The current review of literature will draw on these individual case studies, correlational, and laboratory experimental paradigms to show the current progress of this area of research and the future implications of using brain imaging to detect deception.

INVESTIGATING INTERROGATION TACTICS THAT LEAD TO FALSE CONFESSIONS

Dodgen, Lisa

Faculty Mentor(s): Steve Schepman, Psychology; Danielle Polage, Psychology; Stephanie Stein, Psychology

Poster Session 1: 8:30-11:00 - Poster #40

The current study will investigate the influence of psychologically based interrogation techniques on the likelihood of influencing true and false confessions. Two general types of interrogation tactics will be explored: minimization and maximization. Russano, Meissner, Narchet, and Kassin’s (2005) paradigm will be used which involves accusing participants of cheating on a logic problem. Participants will rate the level of pressure they felt to sign a written statement confessing to cheating. Results are expected to indicate that participants in the maximization condition would false confess more than participants in the minimization condition. In addition, participants who are in the no-prompt condition will indicate a higher level of pressure from the interrogation than those in the prompted condition.
SUCCESSFUL STUDENTS IN LEADERSHIP ROLES AND ON FACULTY COMMITTEES IN HIGHER EDUCATION- HIGHLY EFFECTIVE PROFESSIONAL GROWTH OPPORTUNITIES
Donahoe, Susan; Bridge, Allyson; Holsworth, Jesse; Folkestad, Kyla
Faculty Mentor(s): Susan Donahoe, Education

Session: 36
Oral Presentation 3:20-3:40 in Room 137B

As teacher candidates prepare for their occupation, some are offered the opportunity to be leaders of student organizations and/or to serve as student representatives on university committees. Is it beneficial or is it a waste of their time and energy? Further, as teacher candidates in our educational programs begin work in our schools, are they familiar with policy making procedures, and have they gained experience in how to be confident leaders? The success of representatives of the student population on policy-making committees and in leadership roles in institutions of higher education, specifically at Central Washington University, is the topic for this presentation accompanied by a handout of a review of literature, coupled with actual experienced anecdotal observations. Students experiencing these roles offer evidence as well as in the research and literature. The average student often is unaware of the multi-faceted lives of faculty. As the trend to include student representatives in committees on campus continues, students are able to gain important insights into the complexity and what difficult procedures must be followed for changes in policy or programs and grow exponentially in more personal, professional ways such as analytically and synthetically comprehending information, articulating and expressing ideas with high level communication skills, and developing real world leadership skills. Several representatives from the student population will express their personal experiences as they worked on committees and in leadership roles of organizations here at CWU, providing positive, detailed responses, and conclusions.

THE APPLICATION OF MAJOR PHILOSOPHICAL THEMES TO CONTEMPORARY CERAMIC SCULPTURE
Donovan, Daniel
Faculty Mentor(s): Steve Robison, Art

Poster Session 1: 8:30-11:00 - Poster #45

With the opportunities afforded me through the Farrell Research Scholarship I have been exploring the concepts developed by many existential and ethical philosophers. More specifically what it is to be human and what it means that we are able to question the nature of our existence. My goal has been to incorporate these popular philosophical concepts into three-dimensional and two-dimensional contemporary ceramic sculptures, the art that I am creating will ultimately be culminating in a show at the University’s Sarah Spurgeon Gallery at the end of spring quarter. One major theme that is tying the body of working together is the nature of death and mortality as it relates to us as humans, specifically our apparently unique foreknowledge of our own mortality. I have been working primarily in porcelain with fine line work in blue china paint as well as using gold luster in an effort to draw on the rich history and beauty surrounding these mediums and contrast them with a darker subject matter, one that deals with human suffering, suffering that is most often self-inflicted. I wish to present at SOURCE what I have learned through my work both in developing new tools as well as synthesizing various techniques in the ceramic discipline. I will include in my poster photos of my process, from tools I have built to aid in pressing tiles, to other techniques such as detailed china painting, slip casting, slab building, and reductive surface work.
MONO(2-ETHYLHEXYL) PHTHALATE (MEHP) AS A POTENTIAL INHIBITOR OF THE MITOCHONDRIAL ELECTRON TRANSPORT CHAIN

Dragness, Ryan
Faculty Mentor(s): Carin Thomas, Chemistry

Poster Session 1: 8:30-11:00 - Poster #17

Chemicals that leach from plastics such as phthalate esters, have been scrutinized by scientific and health communities for over thirty years for their putative harmful effect on humans. Among these, Di(2-ethylhexyl) phthalate, or (DEHP), has been one of the most investigated plasticizers for toxicity because of its prevalence in consumer products. When DEHP is administered to animals orally or intravenously, it is enzymatically hydrolyzed or changed to a Mono(2-ethylhexyl)phthalate (MEHP) product. Because MEHP is excreted as a major metabolite of DEHP it is a good candidate for coming in direct contact with cellular features of animals such as mitochondria. In this experiment, the toxicity of MEHP was examined by measuring beef heart mitochondrial health in the presence and absence of MEHP. The relative health of the mitochondria was determined by the rate of oxygen consumption as measured by a Clark electrode. Oxygen consumption was inhibited by 34.5% as compared to controls when mitochondria were incubated in a 100 ppm solution of MEHP at 25°C. Inhibition by 10 ppm and 1 ppm solutions of MEHP was 6.8% and 4.5%, respectively. Control solutions and inhibitor doped solutions were tested in triplicate. The results of this experiment are significant and warrant further investigation of plasticizer use in consumer products.

G MARKET

Driver, Galen
Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management

Session: 15
Oral Presentation 10:25-10:50 in Room 301

G Market understands the importance of efficiently allocating your time and resources as an artist. Known as the 360° service model, we formed a philosophy of infrastructure development focusing on booking, touring, merchandising, online representation, branding, sponsorship, press, visual media, promotions, and general services for independent, unsigned musicians. By keeping all services in-house, we provide a cohesive, cost-effective and time-efficient solution to building and maintaining a thriving fan base and/or brand. Instead of generating and selling generic packages, we customize our services to the specific needs of our clients for one flat fee opposed to a percentage/royalty. From minor projects to national tours, we create results for clients using the 360° service model. Working with artists that create quality music is our passion, therefore allowing our clients to focus solely on being that artist and leaving the rest to us is our top priority. The most unique aspect of G Market is the flexibility and opportunities it provides for the artist without the constraints of working under a label. Giving the artist the opportunity to work with one company that handles their business in its entirety is cost-effective and most importantly, keeps the artists' brand cohesive. Our goal is to sustain mutually beneficial relationships with our clients in order to increase profit and maintain everlasting results. G Market is dedicated to working with independent artists to obtain optimal outcomes in all forms and offer them complete artistic freedom, most importantly, without the limits created by labels.
AUDIENCE EFFECTS ON A COGNITIVE TASK PERFORMANCE IN BROWN CAPUCHIN MONKEYS (CEBUS APELLA)

Dunayer, Erica; Coyne, Sean
Faculty Mentor(s): Megan Matheson, Primate Behavior; Peter Judge, Bucknell University: Animal Behavior

Poster Session 3: 2:00-4:30 - Poster #44

Many primate species alter their behavior depending on the composition of their audience. These audience effects suggest that primates are able to recognize relationships between themselves and other members of their group, and consequently act appropriately. Recognizing relationships between conspecifics is essential to defray the costs associated with group living. To examine audience effects, we compared the performance of brown capuchin monkeys (Cebus apella) on a match-to-sample task in three different settings: dominant audience, subordinate audience, and no audience. Correct performance on these tasks resulted in a food reward for the participant, but not the audience. Previous research has shown that capuchins are subject to audience effects when foraging. Furthermore, research on rhesus monkeys (Macaca mulatta) has shown that subordinate monkeys will “play dumb” on a color discrimination task in the presence of a dominant monkey. Based on these results, we predicted that subordinate monkeys would perform significantly worse on a match-to-sample task in the presence of a dominant individual compared to a subordinate or no audience. Our results showed no difference between conditions suggesting that brown capuchins do not have audience effects when performing a simple cognitive task. It is possible that the social differences between rhesus monkeys and capuchins accounted for this discrepancy. Our methodology also eliminated the possibility of agonistic retribution or punishment from the dominant individual based on the subordinate’s correct performance; therefore, future research should examine the influence that aggressive encounters have on performance of this cognitive task.

A NEW TAKE ON THE CROSS TRAINING GYM

Ehling, Justin
Faculty Mentor(s): William Provaznik, Management

Session: 7
Oral Presentation 8:55-9:20 in Room 301

Unlike the “big box” health clubs of today, Nerve Fitness doesn’t just sell access to a warehouse of equipment; it sells what people really need; RESULTS!! Nerve Fitness’ mission is to inspire and facilitate extraordinary wellness by fostering meaningful relationships, maintaining unparalleled passion for results, and creating unforgettable experiences for members and the community. Nerve Fitness will specialize in group cross-training for a wide range of segments including paramilitary, retired professionals, stay at home mothers and even kids. Nerve Fitness’ training method is innovative, scalable, and rooted in time-tested principles. High intensity group training adds elements of group affiliation and identification which have proven superior in achieving sustainable results. Nerve Fitness facilities will utilize inexpensive, functional equipment and open spaces, creating a cost advantage over traditional gyms. The aesthetic design and brand will be energetic, edgy and tied to local culture. Awareness of cross-training’s effectiveness in improving health and maximizing athletic potential is growing. To date, clubs have widely neglected opportunities to develop strong brands and replicable systems. Many cross-training clubs utilize minimal aesthetics and scant service principles while relying on word-of-mouth marketing. Nerve Fitness will capitalize on this weakness by providing industry leading customer service, additional wellness amenities, inspiring group experiences and more appealing design, supported by an integrated marketing strategy. Nerve Fitness aims to win existing market share and develop interest from new segments by increasing breadth and quality of service. Nerve Fitness reaches beyond the limits of the generic training gym and establishes a new type of boutique training club.
A PILOT PROJECT TO EXPLORE THE ANTICANCER POTENTIAL OF NATURAL PRODUCTS OF SELECTED PLANTS OF THE PACIFIC NORTHWEST AND WESTERN UNITED STATES

Eisenberg, Victoria
Faculty Mentor(s): Gil Belofsky, Chemistry

Poster Session 1: 8:30-11:00 - Poster #1

Research has led to great advances in understanding and treating human cancer, but the need for novel therapeutic agents remains critical. For centuries, plants have been a source of diverse chemical compounds used in the treatment of human diseases, including cancer. The past success of plant-derived natural products suggests a still-promising future for the discovery of potent antitumor agents, such as the blockbuster drug taxol. Despite such success stories, many plant species, and some entire genera, have not yet been studied for their chemical content. Given this immense untapped resource, we plan to implement the simple, effective, WST-8 colorimetric assay for detecting anticancer activity in extracts of plants of the Pacific Northwest and western United States. The human breast carcinoma cell line, MCF-7, will be used in combination with the WST-8 reagent to determine cell viability and proliferation in the presence of test compounds. The assay can also be adapted to test for compounds that potentiate antitumor activity of existing compounds.

FEMININE MYSTIQUE

Eklund, Andrea
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Poster Session 2: 11:15-1:45 - Poster #3

Purpose: The main purpose of this garment was to explore the fit challenges of a custom garment for a drag queen. Creating a performance garment for a curvaceous drag queen poses unique challenges that are not seen with standard sized designs. Another challenge is making a garment that is feminine enough to disguise the masculine features of the wearer but also not forget that she is truly a male, which is key for a drag queen. The mixture of the feminine style, color and bow is contrasted against the harsh leather, large exaggerated collar and fierce collar appliqué. Process: The process of creating this garment started with an extensive interview with my wearer. The goal during the interview was to learn more about the drag queen culture, types of performances, temporary altering of the body for specific types of garments and performances, and key features needed for garments. The garment was designed to be used during high intensity performances that encompassed feminine and masculine features. Techniques: This garment was created with the draping method. The garment was draped, trued and transferred to a paper pattern. Two samples were made and several changes needed to be made, in particular the front princess seams and empire waist. Working with the leather posed a new challenge, unable to pin the leather to the other fabric gluing was necessary to assure it would not move while constructing. twenty yards of net and tulle was used to create the full underlayer of skirting.

“A WORK OF NECESSITY:” THE SABBATH MAIL CONTROVERSY OF 1809-1817

Erickson, Amy
Faculty Mentor(s): Karen Blair, History; Daniel Herman, History

Session: 9
Oral Presentation 10:20-10:40 in Room 135

This paper investigates the origins and outcomes of the first phase of the Sabbath mail controversy during the antebellum period. By investigating nineteenth-century newspaper articles and Sabbath manuals, congressional legislation pertaining to the post office department, and the secondary sources written by postal historians Richard John and Wayne Fuller, I discovered that the Sabbath mail movement could not succeed because congress was more concerned with national business and defense interests. As a result much of the early Sabbath mail sentiment was transferred to other antebellum causes.
THE NON-FINALITY INTONATION OF CHILDREN’S DECLARATIVE STATEMENTS IN SPANISH AND ENGLISH
Falteisek, Zosha
Faculty Mentor(s): Charles Li, English

Session: 19
Oral Presentation 11:40-12:00 in Room 137A

Current research (Delattre, Olsen, & Peonack, 1962; Celce-Murcia, Brinton, & Goodwin, 2010, among others) claims that the non-finality intonation patterns of declarative statements by adult native speakers are falling in English and rising in Spanish. Do native child speakers of these languages exhibit the same non-finality intonation patterns? Do Spanish-speaking children learning English as a second language exhibit the same patterns in both languages? To answer these questions, I recorded the speech of five first grade students. Three are native speakers of Spanish, and two are native speakers of English. The native speakers of Spanish are learning English as a Second Language and were recorded speaking Spanish and English. The native English speakers were only asked to speak in English. I recorded their answering several questions and describing a picture. After a preliminary analysis of the data, the results seem to be consistent with the current scholarship, though a more detailed analysis is under way.

VINTAGE SOUL
Feroglia, Chelsea
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences
Poster Session 2: 11:15-1:45 - Poster #4

Purpose: My love for vintage clothing and rich, bohemian colors led me to explore the styles of the 40s and 70s. The glamor and femininity of the two eras brings a vintage vibe, and adding a modern edge makes today’s woman feel free, beautiful and confident. The look epitomizes this ideal with a flowing top and form fitting bottoms, which show the freedom of choices women have in adorning their body. Process: During the development and execution of my piece I was inspired by retro images. Other inspirations came from some of my favorite music artists and movies that took place in the 40s. I compiled all my thoughts and ideas in a notebook which included color swatches, sketches, and pictures. I studied and researched the history of the two eras and assembled different looks that I could use. Combining various elements from my research I created a casual look that encompasses a woman’s femininity. Techniques: Draping was used to create the top which includes darts and is fully-lined. The ruffles attached to the top and the shorts were created by flat patterning. Both pieces took many hours of sampling, fitting, adjusting patterns, and creating the final product of my research. Materials: Cotton, underlining, chiffon, invisible zipper, interfacing, and moleskin This is one in a line of three garments; the entire line can be seen at the 15th annual fashion merchandising spring fashion show, Revolution, June 4 at 3p.m. and 7p.m. in Milo Smith Theatre, McConnell Hall.

ANALYSIS OF DELTA^{18}O AND DELTA^{13}C DATA ACQUIRED FROM MARGARITIFERA FALCATA SHELL (SITE 45KT315, KITTITAS COUNTY, WA): HOLOCENE ENVIRONMENTAL CHANGE ON THE COLUMBIA PLATEAU
Ferry, Joy
Faculty Mentor(s): Steve Hackenberger, Anthropology & Museum Studies
Poster Session 3: 2:00-4:30 - Poster #3

M. falcata shell remains were recovered from the 1502 trench of the Sanders Site (45KT315) in the 1970’s by Dr. W. Smith. The site is located on Johnson Creek and a tributary of the Middle Columbia River; today this creek does not support this species. The majority of M. falcata remains in the site were concentrated within four levels, radiocarbon dated to roughly 3000 years ago. To determine whether this concentration of M. falcata shells was indicative of regional paleoclimate change, and the type of paleoclimate change,a sample of 50 M. falcata shells from the excavation were prepared and submitted to a laboratory for delta^{18}O and delta^{13}C analyses.Interpretations of the delta^{18}O and delta^{13}C results suggest that early xeric conditions transitioned to relatively steady mesic conditions, and that these mesic conditions supported growth of the shellfish population, and thus the accumulation of M. falcata in levels 13, 12, and 11. These isotopic data and paleoclimate interpretations provide insight and useful background information for future researchers studying the Sanders Site assemblages and how paleoclimate affected prehistoric Native American settlement and resource exploitation patterns in this region.
PIANO IN PRAGUE
Flaten, Erik
Faculty Mentor(s): John Pickett, Music

Session: 25
Oral Presentation 11:40-12:00 in Theatre

What I will cover in this presentation/performance is what I learned and did during my trip to the University of Cincinnati/College Conservatory’s Summer International Piano Institute Prague. I came away from it with something incredibly valuable. By being immersed in this environment of passionate musicians, going to masterclasses and learning about piano, and attending breathtaking concerts, I came back with a renewed love and work ethic for music. I learned a lot about myself on this trip as well. Being alone and in an unfamiliar place for a month really makes you see yourself. I grew not only as a musician on this trip, but also as a person. This trip was not only plenty of fun, but it has become a strong influence on my path of life, and by sharing this trip I hope to encourage others to reach outside of their comfort zone.

THE MISSING PIECE
Flenniken, Arielle
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Poster Session 2: 11:15-1:45 - Poster #5

Purpose: The purpose of this garment was to combine a tightly fitted and structured look with a loose free-flowing feminine look. Creating a beautiful feminine garment out of geometric patterns was a crucial element to this collection. Process: When creating The Missing Piece, I was originally inspired by a series of images from various designers featuring tight fitted corset tops. The idea of creating geometric patterns was inspired by modern architecture. After attending the Fashion Snoops trend forecast presentation at the MAGIC Convention in February, I decided to base my colors off the upcoming hue trends. Orange, green, brown, tan, and white were the primary colors in the “Prehistoric” color trend, which were then applied to this garment. Techniques: This garment was created using the draping method. When creating the geometric patterns, I cut up each large draped pattern piece into various pieces, added seam allowance and checked for compatibility. The pattern for this garment is quite challenging being like a puzzle with many miniscule pieces that have to be put together just right to get a seamless end result. Materials: 100% cotton, chiffon skirt, and an invisible zipper. This is one in a line of three garments; the entire line can be seen at the 15th annual fashion merchandising spring fashion show, Revolution, June 4 at 3p.m. and 7p.m. in Milo Smith Theatre, McConnell Hall.

TOWARD THE SYNTHESIS OF NOVEL BORONATES AS POTENTIAL HIV-1 PROTEASE INHIBITORS
Frank, Michael; Faulkner, Andrea; Holmberg, Leah; Jennings, Julia
Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

Poster Session 1: 8:30-11:00 - Poster #5

Drug discovery for HIV/AIDS has resulted in many life-saving therapies, making a profound impact on modern medicine. Current drug therapies exist, but are highly susceptible to resistance development, have poor bioavailability, and cause several side effects. For this reason, there is an urgent need to develop new types of inhibitors that address those difficulties. We are synthesizing novel boronates that were designed as dual-mode, competitive and associative, inhibitors of HIV-1 protease. Recent studies showed that boron-modified inhibitors have a higher affinity for the protease than their corresponding non-boronated analogs. Furthermore, the boron-modified structures were inhibitory to an HIV-1 protease variant that is resistant to several HIV-1 protease inhibitors. A library of both straight chain and cyclic boronates are being synthesized. The cyclic boronates, due to their structural rigidity, are expected to be better inhibitors than the straight chain compounds.
INVESTIGATION OF ACTIVE REGION PROPERTIES FOR SOLAR FLARE FORECASTS
Fredsti, Feliciti
Faculty Mentor(s): Bruce Palmquist, Physics; Alysha Reinard, NOAA; Doug Biesecker, NOAA

Poster Session 2: 11:15-1:45 - Poster #19

It has become increasingly more important to be able to correctly forecast large solar flares because these events can destroy or interrupt important technology and harm astronauts. We looked at the relationships between different measurements and classifications of sunspots for patterns in the type of sunspot that produced a large flare. We selected active regions with complete data sets containing each of the measurements we wanted to compare; if an active region was missing a measurement, we removed it from the analysis. We also measured the distance between each active region and the nearest other active region on the disk. Once we obtained this information, we generated plots and histograms to look at the tendencies and frequencies of X-class, M-class, and C-class flares as compared to non-flaring active regions. The trends were weak, but we found a correlation between various measures of active region complexity and flaring tendencies. Comparing this to the NHGV value (a parameter that uses subsurface motions to predict flare occurrence) we found that NHGV values tend to be higher for more complex and more compact active regions, even when the active regions produce a similar size flare.

PRIVATE SAUSAGE MANUFACTURING COMPANY
Funk, Jason
Faculty Mentor(s): Kun Liao, Finance & OSC

Lynnwood Center Poster Session - Poster #5

This project will discuss how a small private company will grow its customer base from a local market to a national market by implementing a national supply chain. The company manufactures fresh sausage links and frozen sausage rolls in a variety of flavors. Fresh sausage links only have a self-life of seven to nine days to where the frozen sausage rolls have a self-life of thirty-five to forty-five days. The frozen sausage rolls gives this company an opportunity to expand nationally. The company’s revenues exceeded $4 million last year (FY 2010) in just the northwest. They are looking to prepare to expand nationally and expecting to double their revenue to exceed $8 million by FY 2012. This project will focus on what challenges a small company will face with this type of growth, and how to implement a supply chain strategy correctly and efficiently the first time. The poster will show some challenges a small company might face, while giving solutions learned in supply chain courses and real world experiences. By expanding a supply chain from regional to national will have its challenges, like selecting third-party logistics carrier, current suppliers to meet forecasted higher demands, and looking at strategic partnerships with suppliers to efficiently get the product to the right place at the right time to the right price.

EXPLORING THE UTILITY OF THE NUCLEAR XDH GENE FOR GYMNOSPERM PHYLOGENETICS
Garcia, Erik; Peery, Rhiannon; Wilcox, Kevin
Faculty Mentor(s): Linda Raubeson, Biological Sciences

Session: 4
Oral Presentation 9:10-9:30 in Room 140

We are examining the phylogenetic utility of the nuclear gene XDH (xanthine dehydrogenase) in gymnosperms. Low-copy nuclear genes so far have not been used much in plant phylogenetics, yet they are an “endless” source of additional, independent phylogenetic information. The gene has been successfully amplified to determine the relationships among the conifer family Podocarpaceae, and now we would like to see if we can use the XDH gene for phylogeny in other conifer families. For our test, we designed a primer strategy to amplify 729 base pairs of XDH from a small sample of conifers. Our phylogenetic analyses on this sample suggest that this is a good gene for conifer phylogeny with special utility in the Cupressaceae conifer family. In future studies, we will work to improve our strategy to amplify more of the XDH gene in the Cupressaceae and plan to amplify and sequence each genus in the family.
PUMA
Garza, Emilyesteli
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Poster Session 2: 11:15-1:45 - Poster #6

Purpose: The purpose for creating this garment was to gain experience and understanding of the concepts and techniques that go into constructing a garment that account for the fuller hips and voluptuous curves of the average Latin woman. Process: I started by researching Mexican art, Spanish clothing and Latin architecture and was inspired by their vibrant colors and organic shapes. Incorporating my passion for American muscle cars was important. I researched them from the years 1949-1970. Growing up around these, cars I developed an appreciation for the beauty in their shapes, lines and the attention to detail. Looking through magazines and searching the internet I started a folder of inspirational pieces to further assist me in creating the final garment. Techniques: Draping techniques were used to create the garment. Draping tape was applied to the body form as a guide to achieve the desired lines of the final garment. Pieces of fabric were pinned and manipulated onto the body form and once pinned I marked the key points on the draping. Truing the lines once the pieces were off the form was essential in the process and a pattern was developed from the draping. A sample was made to fit on the model and many changes were completed in order to achieve proper fit of the garment. Once the changes were made they were transferred to my pattern pieces and a final dress was created. Materials: 97% polyester 3% spandex moleskin exterior, 100% polyester crepe back satin interior, seed beads, invisible zipper

PRINCESS ARIEL
Garza-Guerra, Sara
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Poster Session 2: 11:15-1:45 - Poster #7

Purpose: The purpose for creating this garment was to explore the idea of transforming Princess Ariel’s iconic mermaid look and creating a dress that could be worn in a formal setting without looking like a costume. Process: I was inspired by the Disney princesses because they are the epitome of my childhood and I wanted to create a line that with a glance would take the viewer back to a simpler time in their childhood. I was drawn to the feminine shapes, vivid colors and graceful drape of her iconic green fin and purple seashell top. Through use of a tulip front and chiffon train I captured the fluidity in Ariel’s features and costume. Technique: This dress was created by using draping techniques. Fabric was draped onto a body form where it was marked, cut out, and then again placed onto the body form. Once the garment fit the model’s measurements the marks were trued and then transferred onto a paper pattern. From that pattern a sample dress was made to ensure proper fit of the garment, the dress was tailored and the paper pattern was then corrected. The final step of sewing the garment took many hours of machine and hand stitching. Materials: Crepe back satin, organza, chiffon, invisible zipper, and satin ribbon. This is one in a line of three garments; the entire line can be seen at the 15th annual fashion merchandising spring fashion show, Revolution, June 4 at 3p.m. and 7p.m. in Milo Smith Theatre, McConnell Hall.

MAN OF PASSION
Giles, Mark
Faculty Mentor(s): Jon Ward, Communication

Session: 42
Oral Presentation 3:00-3:20 in Theatre

Man of Passion is a biographic picture that intimately examines a young man’s passion for life. This passion is evident in his hobbies, music, and service to our country. Everything in his life is unified by his strong faith, which is the foundation for everything he does. Starring: Danny Bullis; Written, Directed, & Edited by: Mark Giles; Total Run Time: 5:12; URL: http://www.youtube.com/watch?v=yYZsi7uoM_M
A STATISTICAL ANALYSIS OF THE GENERALIZED COLLATZ CONJECTURE

Gill, Kohl
Faculty Mentor(s): Dominic Klyve, Mathematics

Session: 30
Oral Presentation 1:30-1:50 in Room 201

One of the unsolved problems in number theory today is the Collatz conjecture. It was first proposed in 1937 by Lothar Collatz. The problem is usually stated as follows: take any natural number; if it is even divide it by 2; if it is odd multiply it by three and add one. Collatz conjectured that repeating this process will result in the cycle 4-2-1 for any input.

WOMEN & CROSSING THE LINE OF DEPARTURE: A GENDER PROBLEM OR LIONESS?

Gill, Brian
Faculty Mentor(s): Rex Wirth, Political Science; Karl Neal, Military Science

Poster Session 1: 8:30-11:00 - Poster #31

The current rules of the United States Armed Services of the roles of women in combat may not be relevant in the post 9/11 era for the United States. Historically, women have not been allowed to serve in combat duty. Only recently have women been accepted into more combat-oriented support roles, such as the military police corps, logistics, combat aviation, and serving on warships throughout the United States, military. There is no federal statute that forbids women from serving in ground combatant units. However, the current army and marine corps defense policies forbid women from being engaged in any “direct combat”, where the enemy is engaged with fire superiority. Since the tragedy of September 11, 2001, more women have been in combat, under forward support roles, than anytime in American history. Many women have been decorated for their actions in Iraq and Afghanistan. Likewise, women have been used to search women in the populace of Iraq and Afghanistan, rather than men, to avoid cultural relational issues. Yet, since 9/11, more American women have been casualties in War than ever before. The poster presentation illustrates the changes overtime and makes policy recommendations to accommodate these changes.

REFINED LIDAR-BASED, SEISMIC-HAZARD MAPPING AND DIGITAL DATABASE FOR THE LOMA PRIETA SECTION OF THE SAN ANDREAS FAULT SYSTEM, NORTHERN CALIFORNIA, U.S.A.

Gordon, Eric; Tao, Eric; Field, Sam; McBride, Amara; Talley, Jessica
Faculty Mentor(s): Carrie Whitehill, Geological Sciences

Poster Session 2: 11:15-1:45 - Poster #15

In 1989, the 7.1 magnitude Loma Prieta earthquake occurred on a previously locked section of the northern San Andreas fault system (NSAF) in California, resulting in more than $6 billion in damages, sixty-three fatalities, 4,000 injured and 12,000 homeless. Yet, this event produced no known surface rupture. This poses problems for understanding the overall paleoseismic history of the North American transform plate boundary. Our hypothesis is that the most recently acquired high-resolution (0.5 m) Light Detection and Ranging (LiDAR) data can be used to refine existing US Geological Survey (USGS) 1:24,000-scale mapping of the fault segment to work toward identifying areas for potential paleoseismic research and refining existing seismic-hazard assessment. Our approach is to use Geographic Information System (GIS) software to integrate seismic-hazard mapping completed prior to and immediately after the event with new mapping based on fieldwork and high-resolution digital elevation and hillshade models derived from the 2007 GeoEarthscope LiDAR database. The sixty-mile-long Loma Prieta segment of the NSAF cuts through steep, vegetated, and populated areas. The advantage of using the LiDAR data is that the vegetative and urban layers are stripped away to provide a bare-earth view of subtle geomorphic features such as fault rupture, ponded alluvium, offset streams, landslides, and sag ponds that contain information that aid in constraining the fault-slip history and related seismic hazards. This approach enables us to successfully refine seismic-hazard mapping and locate areas ripe for future paleoseismic investigations. The final compilation of the database will be archived at the USGS.
THE HORRORING
Greer, Jacob; Drougett, Austin
Faculty Mentor(s): Michael Ogden, Film & Video Studies

Session: 8
Oral Presentation 8:30-8:55 in Theatre

If Jason was to ever run across a film crew it would be documented in The Horroring. A movie within a movie, The Hororning is a student-produced film that follows a film crew whose unrelenting director puts his crew and his own life in danger. Always looking for the perfect shot, the director places his crew in harms way when he decides to ignore the ghost stories and film inside of a old Student Union building, only to find that the truth is more terrifying then the wild stories. No one is safe when the crew realizes that they must choose between the perfect film and their lives. The filming style draws on visual aesthetics of traditional horror films with a mixture of Duke Nukeum and The Blair Witch Project to create an atmosphere of intensity and uncertainty that leads its viewers through an emotional rollercoaster.

THAT ALIEN KING IS MY BABBY DADDY
Greer, Jacob
Faculty Mentor(s): Michael Ogden, Film & Video Studies

Session: 8
Oral Presentation 9:30-9:50 in Theatre

Satirical by nature, That Alien King is My Babby Daddy, takes a comical look at how relationship issues are resolved and how daytime talk shows have been used as a platform for people to air their dirty laundry in a public forum. Transcending race, gender, and species, That Alien King is My Babby Daddy is a no holds barred parody on how ridiculous daytime television shows (specifically Maury, Jerry Springer, the Steve Wilco show, etc.) have become.

BUILDING A HUMAN POWERED ELECTRICITY GENERATION SYSTEM
Griffith, Garrett
Faculty Mentor(s): Roger Beardsley, Industrial & Engineering Technology

Session: 6
Oral Presentation 8:30-8:50 in Room 202

In this presentation the issues related to designing and assembling a Human Powered electrical generator system are discussed. The goal is creating a self-powered demonstration system where students can plug in a charger to top up their iPod or cell phone battery charger using power they generate themselves. In addition the system is designed with enough spare capacity to run a video display playing a movie on a related topic. This project began with a recumbent tricycle built as a student project in 2005 for a national Human Powered Vehicle competition sponsored by ASME (American Society of Mechanical Engineers). An existing bicycle training stand (normally used for stationary testing of the bicycle) was modified to accept a belt driven 300W DC generator used to charge a 12 Volt automotive battery. Other system components were added to control a charge to the battery and record power supplied from the generator. An 800W DC-AC converter was added to convert the battery charge to 120V AC voltage for operating most items that plug into a wall socket. A Kill-a-Watt power meter was added to the outlet on the DC-AC converter to record AC power used in a power strip where charging devices are plugged in. A chart informs students how much energy they need to generate to replace battery energy consumed in charging their device.
IDENTIFICATION OF PROTEINS THAT INTERACT WITH THE TRANSCRIPTION FACTOR Emx2 IN DEVELOPING MOUSE NEOCORTEX

Groves, Jennifer  
Faculty Mentor(s): Todd Kroll, Chemistry

Session: 21  
Oral Presentation 12:20-12:40 in Room 140

The neocortex is a brain structure found only in mammals and is responsible for the conscious perception of the outside world and for decision making. The neocortex of the mouse brain is divided into four major areas that are responsible for processing discrete types of information, including input from vision and touch receptors and output to muscles. The transcription factor Emx2 is active in a high posterior to low anterior gradient in developing embryonic neocortex of both mice and humans. In mice, it is known that this graded activity plays a significant role in determining the relative sizes of each of the neocortical areas, and genetic modification of this expression pattern has a profound effect on behavioral performance tasks. Although the regulatory activity of transcription factors is frequently mediated by interactions with additional proteins, no screens seeking to identify Emx2-interacting proteins have been reported. Here, we report our results obtained using Emx2 as bait in a yeast two-hybrid screen, utilizing a yeast-mating protocol. Colonies that appeared on the initial selective medium plates were streaked onto a different set of selective plates to confirm the protein-protein interactions. The prey plasmids were rescued, purified, and sequenced. Sequencing of these clones has revealed several potential binding partners of Emx2 that include Quaking, Ubiquitin like-modifier activating enzyme E1, and the CCR4-NOT transcription complex. These interactions are currently being retested in yeast and future work will include in vitro experiments to further confirm that these proteins are binding partners of Emx2.

IMPROVING THE RELATIONSHIP BETWEEN ELLENSBURG LOCALS AND UNIVERSITY STUDENTS

Gunning, Dylan; Burrel, Jenae; Staples, Karly; Stone, Jocelyn  
Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management

Session: 5  
Oral Presentation 8:50-9:10 in Room 201

The subject area of the research included the opinions of current CWU students and local residents regarding their living situations amongst each other within the community. The subject area covered noise ordinance issues, property regulations, alcohol abuse, rental agreement, policing and problem areas within the community. How can the relationship between university students and local Ellensburg residents be improved? The main bodies of evidence that will be present in our research are the indicated fields from above, as well as a large section on alternative choices that students and local residents can take before taking any legal action. Additionally, evidence from local police reports and security services will be analyzed and compared to survey results taken from the public and university. Conclusion: We have discovered that there are many problems between university students and local residents that need a number of solutions that can be solved through both discussion and legal resources. Additionally, the problems stem from not just one student or resident there are distinct patterns in behavior that must be addressed to successfully solve this problem.
PB&K EVENT PLANNING COMPANY

Hahn, Whitney
Faculty Mentor(s): Robert Lupton, Information Technology & Administrative Management

Session: 15
Oral Presentation 10:00-10:25 in Room 301

PB&K Event Planning will be the first company to provide event planning to businesses and individuals of Issaquah, Washington. PB&K will emphasize “eco-friendliness.” From recycling to using sustainable materials, we will value the importance of being eco-friendly as will our clients. PB&K will offer private corporate events, anniversaries, graduation parties and offers fair-trade cooking classes hosted by local celebrity chefs. PB&K will specialize in themed socials, such as organic wine tasting with food pairings, frozen-yogurt social cook-offs, and even psychic readings. Personalized services will suit the needs of the consumer to help them plan their events in an efficient, cost-effective, and eco-friendly way. A competitor analysis shows, there are no other businesses in the state that offer eco-friendly services and culinary cooking classes as part of their services. The greater Seattle area has roughly 8-10 event planning companies, but 70% are focused mostly on weddings. The Issaquah market has very high to medium income and has many stay-at-home moms, busy business dads, and career-savvy people that don’t have time to plan. Additionally, a high amount of disposable income is found primarily in the Eastern King County. Once PB&K has taken off, the maximum number of events will be five per week with an expected $11,500 average per month of profit. By offering the best socials around the Pacific Northwest, PB&K’s mission will be to provide upscale, personalized, and affordable planning while continuing to be eco-friendly along the way.

SYNTHESIS AND CHARACTERIZATION OF ZnS/ZnO SEMICONDUCTOR NANOPARTICLES

Hall, Daniel
Faculty Mentor(s): Dion Rivera, Chemistry

Session: 20
Oral Presentation 12:00-12:20 in Room 137B

The goal of this research was to produce fluorescent quantum dots (QDs) also known as semiconductor nanoparticles from relatively abundant and benign materials such as zinc along with capping agents of L-cysteine and sodium polyphosphate. QDs are commonly made from materials such as cadmium and arsenic which are generally undesirable elements in the body or the environment. These fluorescent materials have potential uses as replacements to the organic dyes used in medical imaging, solar energy technology, optical sensing and light-emitting components. ZnS/ZnO semiconductor quantum dots (QDs) have been synthesized with L-cysteine and sodium polyphosphate capping agents using a colloidal synthesis method. The QDs were characterized through the use of fluorescence spectroscopy, UV/Vis spectroscopy, and X-ray diffraction (XRD) instrumentation. Introduction of oxygen during the synthesis reaction increases the intensity of the QD fluorescence and alters the composition from a ZnS nanoparticle to a ZnS/ZnO nanoparticle. Use of an analytical equation along with ongoing testing of samples using XRD has yielded an estimated diameter of between 5.4 nm and 6.1 nm for the ZnS/ZnO semiconductor nanoparticles. Surface composition was determined by fluorescence quenching experiments which measure the decrease in fluorescence intensity caused by ZnO complexing with cobalt(II) ions.
ONE WORLD FITNESS

Hampton, Elizabeth

Faculty Mentor(s): Kenneth Cohen, Recreation and Tourism

Session: 24
Oral Presentation 12:05-12:30 in Room 301

One World Fitness: Doing good and feeling good. One World Fitness is taking a sustainable approach to developing and delivering a business model that will leave people doing good and feeling good. Starting with Kittitas County my core competencies will deliver fun, fitness demonstrations to certain target groups in their own homes. Such target groups include, Veterans, young mothers, or children experiencing stress. I will provide demonstrations of the latest fitness fad, Zumba- that blends international and Latin-inspired music with easy steps, that will promote a healthy lifestyle. In addition to a fitness demo, One World Fitness will offer sustainably sourced fitness fashion and organic based soaps. Utilizing my certification in Zumba as a direct marketing strategy, I can connect groups socially while providing sustainable alternatives for fashion and health products. The hosts/hostess of these gatherings will receive a 15% discount towards a Zumba class with me. Investment is needed to further develop a line of products and create a branding strategy. I plan on taking this concept to the next level by incorporating a brand of merchandise, generating opportunities to connect groups in a healthy environment and develop a profitable business model. One World Fitness will educate, connect and create happier healthier people. This opportunity will channel my passion, experience and skills into a profitable and productive venture.

SUMMARY OF SONGBIRD BANDING DATA AND THE ECOLOGY OF A RARE HABITAT IN SONORA, MEXICO

Hannuksela, Adam

Faculty Mentor(s): Daniel Beck, Biological Sciences

Session: 12
Oral Presentation 10:00-10:20 in Room 140

Migratory bird populations have shown declines in recent decades. Conditions on wintering grounds are believed to be the primary cause. However, little is known about the biology of these birds in their Latin American homes. In southwestern Sonora, Mexico, a rare thornscrub habitat known as el pitayal is a wintering area for many migratory birds of western North America. This habitat holds the largest concentration of columnar cacti in the world. Yet it is relatively understudied and faces numerous threats such as grazing, and conversion to industrial aquaculture and agriculture. Since 2006 I have been operating a songbird banding station that is part of an international monitoring effort to investigate populations of migrant and resident songbirds during the winter. I have captured and marked songbirds in southern Sonora for 75 banding sessions. The data are beginning to show overwintering survival, as well as an index to abundance for 60 species of migrant and wintering birds from over 1000 captures. This study describes the natural history of southwestern Sonora for the first time.

WOMEN IN SHELLY’S FRANKENSTEIN: A TRUE REPRESENTATION OF THEIR TIME

Harlan, Justine

Faculty Mentor(s): Ruthi Erdman, English

Poster Session 3: 2:00-4:30 - Poster #45

In a time in which women were not allowed to vote, own property, or hold a job, Mary Wollstonecraft Shelley had the courage and the ability to soar above her male counterparts in the world of literature. Shelley’s Frankenstein is more revered today than her husband’s popular poetry. However, at the time Shelley wrote her first and best loved novel, she was forced to publish it under anonymously in order to receive any recognition whatsoever. In more recent times Mary Shelley has been criticized by feminists for not writing a novel which contained strong women characters. While Shelley’s Frankenstein is a story about men, Shelley does comment upon, although quite subtly, the status and recognition of women during her time. Through her portrayal of meek, passive women, women’s sacrifice, and the process of birth, Shelley cunningly illustrates the horrible conditions for women during her time period.
QUINOA FLOUR IS AN ACCEPTABLE REPLACEMENT FOR ALL-PURPOSE FLOUR IN PEANUT-BUTTER COOKIE

Harra, Nikki; Smith, Courtney; Lemm, Tara
Faculty Mentor(s): David Gee, Nutrition, Exercise, & Health Services

Poster Session 3: 2:00-4:30 - Poster #35

ABSTRACT Compared with wheat flour, quinoa flour is a source of higher quality protein and has a higher nutrient density for several vitamins, minerals and dietary fiber. In addition, removing gluten by the total replacement of wheat flour with quinoa flour in baked products is a treatment for Celiac disease and gluten intolerance. Peanut-butter, chocolate-chip thumbprint cookies were prepared with 100% quinoa flour (100% Quinoa) (ConAgra Mills, Inc, Omaha, NE), 100% all-purpose flour (Control), and a 50/50 mixture of all purpose/quinoa flour (50% Quinoa). Objective tests performed were penetration force, withdrawal force, and shear force using a universal texture analyzer (TA.XT2, Texture Technologies Corp., Scarsdale, NY/ Stable Micro Systems, Godalming, Surrey, UK). All tests showed significant differences (p<0.05). 100% Quinoa required the greatest force for all tests, 50% Quinoa required the lowest shear force and the Control required the lowest withdrawal and penetration forces. University students completed subjective evaluation of the cookies in a controlled environment. Using triangle tests, 54 judges were unable to statistically distinguish the Control from the 50% Quinoa (p>0.05). Sensory tests for chewiness/tenderness, saltiness, sweetness and preference were evaluated by 30 judges and rated on a nine point scale. No significant difference in preference was found between the three cookie variations. However, the 100% Quinoa was significantly sweeter and chewier than the Control. Quinoa flour substitution at 50% and 100% was an acceptable replacement for all-purpose flour in a peanut-butter, chocolate-chip thumbprint cookie.

THE IMPACT OF THE GREAT WESTERN DEVELOPMENT STRATEGY ON NORTHEASTERN CHINA

Harrison, Isa; Houck, Meredith; Jiwani, Naushin; Welch, Jennie
Faculty Mentor(s): Richard Mack, Economics; James Cook, History

Session: 1
Oral Presentation 9:30-9:50 in Room 135

The purpose of this research was to examine the impact of the Great Western Development Strategy on the economic, social, and environmental conditions of northwestern China. It focuses in particular on changes occurring in the northwest provinces of Shaanxi, Ningxia, and Gansu. We conducted a regional comparative analysis using cross-sectional data to assess the impact of the policy during its initial implementation phase from 1999 to 2007. Relying upon both qualitative and quantitative data, we found that overall the GWDS has had a positive impact on these northwestern provinces, specifically on education, standards of living, rural household incomes, and structural changes from primary to secondary industries. However, our research also revealed deficiencies in water resource management, disparities in the allocation of investment across and within provinces, and other shortcomings of the GWDS. The results of this research will be a valuable contribution to the ongoing discussions about the efficiencies of regional development strategies, and will be especially important in understanding the importance of China’s northwest in promoting the country’s overall growth.
MINE RECLAMATION BOND PRICING POLICY: AN ANALYSIS OF THE EFFECTIVENESS OF SURFACE MINING REGULATION

Harrison, Isa
Faculty Mentor(s): Chad Wassell, Resource Management; Wirth Wassell,

Session: Poster Session 2: 11:15-1:45 - Poster #26

Effective mine reclamation, particularly regarding water pollution, is a critical issue to which more policymaker attention is required. Although mining practices always carry some environmental risks, there are policies available to reduce these risks. In order to formulate and implement effective water remediation policies, mining companies and policymakers must collaborate to both improve mining practices during mine operation and to identify effective post-mine-closure strategies. In this thesis I investigate through meta-analysis and case studies how effective the current reclamation bond policies are at addressing the environmental concerns of mining. In particular, my research focuses on bonds as a tool for proactive environmental policy; efficient reclamation bond pricing is a key point of investigation. My research illustrates how risk analysis can be incorporated into policy formation, and the use of deposit-refund mechanisms to increase efficiency and mitigate environmental damages, thus lowering costs to society.

THE EFFECTS OF ENVIRONMENTAL FACTORS ON HUMAN LIFE SPAN

Hart, Douglass
Faculty Mentor(s): Dominic Klyve, Mathematics

Session: 38
Oral Presentation 2:40-3:00 in Room 201

There are a multitude of factors that can affect the health and longevity of the people of the world today. These factors can fall into many different categories; from factors directly under our control such as diet and exercise to factors controlled by society as a whole such as quality and accessibility of health care to environmental factors such as the quality of the air. The exact effects of these factors can be difficult to measure at times, especially for environmental factors, because for factors a direct relationship cannot be observed between the variables in question. Because of this the effects of the outside environment on a person’s health and lifespan are often not as well understood as those directly under society’s control. The goal of this report is to attempt to find the nature and magnitude of the relationship, if any, that exists between a person’s lifespan and the external environment that that person lives in using statistical techniques.

ALTITUDINAL VARIATION OF THE PACIFIC CHORUS FROG, PSEUDACRIS REGILLA

Healas, Sara
Faculty Mentor(s): Jason Irwin, Biological Sciences

Session: 12
Oral Presentation 10:40-11:00 in Room 140

This study is comparing the physiological responses to freezing of Pacific Chorus Frogs from sea-level to a high-elevation site on Snoqualmie Pass. The Pacific Chorus Frogs have an amazing ability to freeze solid during the winter months. They are able to do this because they store massive amounts of glycogen that they break into glucose. Glucose is used for (1) to protect the cells during freezing and (2) to support general metabolism throughout the entire winter. The hypothesis is that the frogs collected at the high-elevation site will have more glucose stored as glycogen because these frogs have to survive harsher and longer winter than the frogs’ sea-level. We collected frogs in the spring from the Ellensburg area and Swamp Lake and housed them until the fall when they had developed their cold tolerance. They were then moved inside to an incubator set at 2°C. In January the frogs were frozen in a cooling bath down to -2.5°C. Once frozen, the frogs were dissected and liver and thigh were extracted and frozen at -80°C. Each tissue was later homogenized in acid and then neutralized with a base to extract the glucose and glycogen for measurement. The glucose and glycogen solutions are mixed with a color reagent which forms a colored product in the presence of glucose which is measured with a spectrophotometer. Results from the past two year’s experiments will be presented.
"GREAT AND TERRIBLE," OR "GREAT AND POWERFUL:" THE REDEMPTION OF O.Z. DIGGS, THE WIZARD OF OZ

Hegstrom Oakey, Jesse
Faculty Mentor(s): Matthew Altman, Douglas Honors College

Session: 32
Oral Presentation 1:30-1:50 in Room 301

In L. Frank Baum's *The Wonderful Wizard of Oz*, shortly after Dorothy and her traveling companions discover the Wizard to be a fraud, Dorothy says to the Wizard "I think you are a very bad man." “Oh, no, my dear; I'm a very good man;” he replies, “but I'm a very bad Wizard, I must admit." But is this entirely the case? Is he a good man? Is he, in his position on the throne of Oz, a good Wizard? Upon examination of the actions of the Wizard after he landed in Oz, we can see that in many cases he is not at all an ethical character. In fact, some of the things he does - tricking the Ozians into making him their ruler, manipulating the Witch Mombi into enchanting Princess Ozma, the rightful ruler of Oz, turning her into a boy, or sending Dorothy to kill the Wicked Witch of the West - could be considered worse than the dealings of the Wicked Witches. However, his presence on the throne of Oz does serve as a stabilizing force in the political turmoil of Oz, which was crying out for a savior from the oppression of the four Wicked Witches.

GREEK LIFE AT WASHINGTON STATE UNIVERSITIES

Helkey, Shaun; Powell, Maxwell
Faculty Mentor(s): Rex Wirth, Political Science; Todd Schaefer, Political Science

Session: 26
Oral Presentation 1:30-1:50 in Room 135

The absence of Greek organizations at Washington State Universities is reducing student involvement, lowering graduation rates and GPA's, and discouraging alumni contributions. These state universities are discriminating against students and individuals who are trying to participate and become involved in Greek organizations. Universities that don’t have Greek organizations have fewer student leaders and are denying students the access to opportunities that they can have with Greek organizations. Statistics show that those involved in Greek organizations participate more in school activities, are being more involved in alumni associations, and contribute money to their alma maters. With an official state policy for Washington’s Public Universities regarding the establishment of Greek Life, the students of the state will benefit, as will the schools and the communities that surround them.

QUANTITATIVE LITERACY THROUGH SCIENTIFIC ARGUMENTATION: A GENERAL CHEMISTRY SPECTROSCOPY LAB

Helland, Terry; Donaldson, Josh; Gutierrez, Clara; Peterson, Brandon; Aichele, Cheri
Faculty Mentor(s): Timothy Sorey, Chemistry; Martha Kurtz, Chemistry; Dion Rivera, Chemistry

Session: 11
Oral Presentation 10:40-11:00 in Room 137B

This research presents the implementation of various Electronic Data Collection Devices (EDCD) and corresponding data analysis into a first quarter general chemistry spectroscopy laboratory at Central Washington University in the Fall Quarter of 2010 and Winter Quarter 2011. By adjusting EDCD in student inquiry-based lab activities and gauging whether or not students’ quantitative reasoning and scientific argumentation better supports proposed scientific models of quantized electron orbitals, we intend to better understand what learning affordances these EDCD offer our students. Experimental Hypothesis: If ease of use with EDCD increase students' ability to observe and acquire evidence in support of scientific phenomenon, then an increased ability to apply mathematical graphing, creation of data tables, and curve fitting equations will be observed because effective scientific argumentation incorporates quantitative evidence, otherwise referred to as Quantitative Literacy. Assessment Data: Control (N = 150) and Test (N = 200)
BEE COLONY OPTIMIZATION OF PROTEIN FOLDING
Hepler, Kristoffer; Williamson, Forrest; Haberman, Zachery
Faculty Mentor(s): Razvan Andonie, Computer Science; Levente Fabry-Asztalos, Chemistry

Session: 3
Oral Presentation 9:30-9:50 in Room 137B

Proteins are the chief actors in the cells that make up all living organisms. They facilitate and speed up the majority of chemical reactions that are biologically important in the cell. Proteins are chains of amino acids connected by peptide bonds. It is known that these sequences of amino acids fold in a 3-dimensional conformation that minimizes Gibb’s Free energy. The structure of a protein dictates the function of that protein. Protein structure prediction (PSP) is the problem of determining the 3-d conformation of proteins from their primary amino acid sequences. PSP optimization is a difficult problem because of the belief that free energy landscapes have many local minima. In this study, a Bee Colony Optimization (BCO) has been implemented to tackle the PSP problem. The BCO mimics the foraging approach of honey bees searching for and gathering nectar in a flower bed. The BCO performs a wide search of possible solutions, then searches the local space of the best solutions found. The BCO algorithm has randomization mechanisms which minimize the chance that it will be trapped in a local minima.

AN INFORMATIONAL STUDY ON THE NECESSITY OF FOUR POLICE PRECINCTS WITHIN THE CITY OF ELLENSBURG AND ITS OUTSKIRTS: SAFETY VS NUISANCE
Hewitt, Torey; Cannon, Paul; Kincer, Matt; Stuen, Daniel; Smith, Rachel
Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management

Poster Session 3: 2:00-4:30 - Poster #30

The different police precincts in Ellensburg, Washington which consist of the State Patrol, University Police, City Police, and County Sheriffs all have a bearing presence to Central college students. The impression has been given that law enforcement for the City of Ellensburg is discriminatory towards students of Central Washington University. There is a need for campus police, but there are three other types of police precincts enforcing laws on the students as well. There must be a line drawn for who gets jurisdiction for the campus. The extra police force in Ellensburg and on the Central campus has caused many students to be kicked out of school and to drop out. The unneeded presence of the outside police precincts is causing the campus to build quick assumptions about the police. Through the description of our thesis, one is able to see the views it portrays. By having the four different police precincts, it causes us to bear the question, is having four different police precincts in one small town efficient and is it too overbearing or a nuisance? This group wants to suggest new ways to create a fair judicial system within the campus of Central Washington University and its outskirts.

CROSS-CALIBRATION OF TWO ANALYTICAL TECHNIQUES FOR THE DETERMINATION OF PICO- TO NANO-MOLAR LEVELS OF IRON IN AQUEOUS SOLUTIONS
Hinz, Daniel; Wood, Whitney
Faculty Mentor(s): Anne Johansen, Chemistry

Poster Session 1: 8:30-11:00 - Poster #7

As part of a larger project to understand the mechanism of iron redox chemistry in aerosol particles which supply the limiting micronutrient iron to phytoplankton in the remote open ocean, we are developing the parallel use of two analytical instruments that combined allow us to quantify ferrous iron (Fe(II)) in aqueous solutions from 50 pM to 300 nM. The flow injection analysis system (FIA) operates by the interaction of Fe(II) with luminol to produce detectable chemiluminescence and is extremely sensitive at the picomolar levels, while the liquid waveguide capillary cell (LWCC) relies on the absorbance measurement of the Fe(II)-Ferrozine complex and is useful at the nanomolar levels. Cross calibration will be carried out initially by analyzing synthetic samples and subsequently actual atmospheric samples to test the effect of sample matrix on the signal. The overarching goal is to analyze stored aerosol samples from the remote South Atlantic and equatorial Pacific Oceans that will be extracted into clean seawater at environmental concentrations, i.e., 0.1-2 nM Fe(II). To our best knowledge, such a cross calibration study between the FIA and LWCC determination of Fe(II) has not been performed.
GOOD COUNTRY MUSIC FROM AMARILLO TO ABILENE: WEST TEXAS FOLKLORE AND THE CREATION OF MODERN COUNTRY MUSIC

Holly, William
Faculty Mentor(s): Daniel Herman, History

Session: 9
Oral Presentation 10:40-11:00 in Room 135

The region of West Texas has always had a unique folklore that revolves around open spaces, punishing weather, cowboys and ranching, and farming. This lore began to find its way into popular music in the 1930s with the singing cowboys and Woody Guthrie’s Dust Bowl Ballads. It continued in the 1960s with Marty Robbins’s hit song “El Paso,” and in the 1970s with Waylon Jennings and “Outlaw Country.” “Good Country Music From Amarillo to Abilene” investigates how the lore and myths of the cowboys, landscapes, and self-reliant settlers of West Texas became the popular image of the region in American culture. The investigation then turns to show how the popularity of artists and lore of West Texas, through migrations of people and national success, became incorporated into the country music industry of Nashville. These developments cemented the link between West Texas and country music by the late 1950s. Finally, this work will show how in the 1960s and 1970s, West Texas lore and artists were not only shaping the music, but commercial successes started to shape the culture of West Texas as well. With this last development, the myths of the American West and West Texas became intertwined, which, with few exceptions, is how they remain today in folklore and commercial country music.

ARCHITECTURAL CAD

Hsu, Andrew
Faculty Mentor(s): Chris Scarlett, Industrial & Engineering Technology

Poster Session 3: 2:00-4:30 - Poster #21

The use of computer aided design (CAD) and building information modeling (BIM), allows the user to develop models of great complexity while remaining seamless and organized. Therefore, it was assigned that we would build a commercial project using the program Autodesk Revit Architecture 2011. Techniques used in the commercial project drew upon prior experiences with Rhino 3D NURBS modeling and Autodesk Autocad. Approach to the project started with an idea of a large curved curtain wall, then evolved to a structure that was driven by emotion and personal experiences. Chanmé Steakhouse, originally named MAC steakhouse, featured a one story, two level building with minimal seating area. The final iteration of the building became Chanmé Steakhouse, a two story restaurant, featuring double curved curtain walls mimicking the bow of a cruise ship. The evolution of Chanmé is the culmination of understanding parametric relationship in the Revit program, in unison with developing an extreme interest in advancing personal skill as well as increasing project realism.
The mission of ECOntainer Homes LLP is to provide low-income college students with their own modernistic living space in a low-cost, ecologically friendly apartment complex; through the use of surplus 40’x8’ ISO Shipping Containers and other recycled materials. Shipping containers are constructed from strong, non-corrosion Corten steel, they exceed U.S. Building Codes, and are ideal for multiple floors and levels; these modules are the safest superstructure for an apartment complex. Building with containers allows for fast construction, they are economical, and easily available. Building with containers should cost from 20% to 50% less than traditional custom-designed homes. This plan will solve the problem of a huge surplus of containers piling up all over the world, and in U.S. ports where out of 5 containers that are sent to the U.S. only 1 return. Another problem this will solve is the lack of low-cost “green” housing available to students in the community. The target market will be “low-income” Central Washington University students, living on their own for the first time. College students often receive little help for housing costs during their college careers, and are often forced to share rooms and living spaces with various people to ease the costs of living. This housing complex, will allow these individuals to live in a simple studio apartment by themselves. Competitive advantages of the plan will be: being the lowest-cost producer and provider of housing to an ever-growing demographic of college students, and being the only ecologically friendly student-housing complex in Ellensburg.

INCORPORATING PHILOSOPHIES OF EDUCATION INTO FIRST-YEAR COMPOSITION CURRICULUM

Many first-year students arrive at college, thinking that they have enrolled to acquire job skills, and they criticize many of their courses as wastes of time unrelated to their majors or their intended professions. Additionally, professors decry students’ passive modes of learning or indifferent attitudes toward valuable topics and ideas. If recent books on this topic are any indication, the problem of passive attitudes to education and indifference to valuable ideas has reached epidemic proportions. How, then, can instructors demonstrate to skeptical students that learning is a valuable activity? Engaging skeptical students in discussions concerning the purpose and value of education early in their academic careers would be ideal. First-year composition courses create an excellent setting for opening that conversation. Many incoming freshmen have to stop and reflect on their past educational experiences and their own philosophies concerning the value of education in order to learn to manage their collegiate academics. This paper will present some of the methods which I have used over the past three years to engage first-year composition students in discussions concerning the purpose and value of higher education. The catalyst for these conversations has been a collection of articles which discuss different aspects of education. These readings allow students to challenge the master narratives which have made them skeptical about the value of education. By merely playing the role of moderator in the discussion of these articles, I have witnessed students engaging in discussions which require them to consider their motives for pursuing higher education.
DISCOVERING FUNCTION: LATE STAGE RETINAL NEURODEVELOPMENT

Iniguez, Jesus

Faculty Mentor(s): Daniel Selski, Biological Sciences; Audrey Huerta, Geological Sciences

Session: 21
Oral Presentation 11:40-12:00 in Room 140

This research project entails the characterization of Calcineurin (CaN) in neuron development. CaN is an intracellular protein that has been implicated in different systems as a mediator between neurons and their surroundings to promote healthy function (Lee & Park; 2006). As a neuron grows, it extends a process (axon) in search of a specific target with which to form a synapse. Initial embryonic axon growth is directly related to axon growth and regeneration in adults. Thus, characterization of the process of axon growth is essential to the understanding of centralized and systemic diseases of the nervous system. The developing embryonic chick has been extensively investigated and shares common visual system developmental pathways with humans, therefore it is an appropriate model system for this investigation. This research focused on axon growth and synapse formation of retinal axons with reduced functional CaN. Fk506 was the pharmacological agent used as the CaN inhibitor during late stages of neurological development. Preliminary results have shown that by inhibiting this protein, a reduction in axon length and specific connections to the normal target in the brain has occurred.

RESPONSE OF THE MEDICINAL PLANT, ARTEMISIA ANNUA, TO ENVIRONMENTAL STRESS

Inions, Eric; Purrington, Teegan; Mayer, Tim; Markward, Adam; Bush, Tyler

Faculty Mentor(s): Mary Poulson, Biological Sciences

Poster Session 3: 2:00-4:30 - Poster #19

Artemisia annua L., of the Asteraceae family, has historically been used to treat a variety of medical ailments such as, skin disease, fever, and intestinal problems. More recently, the plant has been shown to be effective against malaria-causing strains of Plasmodium falciparum. The active component, found mainly in glandular leaf hairs of A. annua, is the secondary compound, artemisinin. Limitations in commercial production of artemisinin as an anti-malarial compound include the relatively low yield of the compound within the plant and the fact that, as yet, we do not understand the metabolic pathways that produces the compound well enough for artificial synthesis. The amount of artemisinin produced by the plant is variable and ranges from 0.01-1.2% of the total dry weight. The production of secondary compounds by plants is often increased when the plant is exposed to environmental stresses such as high light, herbivory, or low water availability as the plant invests more energy in protecting its photosynthetic tissue under these conditions. Variability in the range of artemisinin production reported for A. annua globally may be due to different growth environments for the plant. We are working to determine whether artemisinin production increases for A. annua when the plant is subjected to environmental stresses. Visualization of artemisinin-producing glandular leaf hairs using fluorescence microscopy and high performance liquid chromatography are used to quantify artemisinin production while chlorophyll fluorescence is used to monitor photosynthetic productivity of the plant and drought stresses status is determined using thermocouple psychrometry.
THE VIOLA AS A SOLO INSTRUMENT

Jasper, Jessica
Faculty Mentor(s): Carrie Rehkopf-Michel, Music

Session: 25
Oral Presentation 12:20-12:40 in Theatre

My research project is the preparation and performance of a recital of works featuring the viola. The viola, an instrument of the violin family, slightly larger and tuned a fifth lower than the violin, has a significant place in the history of Western Music. The contemporary violist has a rich and varied repertoire of important solo and chamber music compositions from the 17th through 21st centuries to explore, study, and perform. For this project I studied, and prepared for live performance, a broad cross-section of the repertoire, focusing on well-known standards and lesser-known gems, by composers of diverse nationality and historical style periods. Research time was largely spent with score study and individual practice on the instrument. The final product will be a recital presented on the Central Washington University campus in Ellensburg, WA, as well as at an off-campus concert venue. Musical performance is a living artistic tradition, which must be renewed by each subsequent generation. By undertaking this research project I studied and mastered the nuanced and complex aural, kinesthetic, and mental activities required to recreate the musical compositions of the composers of the classical tradition.

THREE YEARS OF SNOW-WATER EQUIVALENT DATA FROM SNOQUALMIE PASS, WASHINGTON, AS DETERMINED BY ELLensburg HIGH SCHOOL STUDENTS

Jenkins, Matthew; Wheeler, Avery; Brunk, Breanna; Ensz, Carsten
Faculty Mentor(s): Susan Kaspari, Geological Sciences

Poster Session 2: 11:15-1:45 - Poster #16

In the Western United States, snowmelt from mountains comprises the majority of regional water supplies, and also drives downstream processes such as groundwater recharge and ecological interactions. Globally, over 1/6th of the world’s population relies on water from glaciers or seasonal snowpacks. Snow-water equivalent (SWE), the amount of water contained in a snowpack, is the best metric to measure snowpack health. Over the past three winters students from Ellensburg High School science classes, in conjunction with fellows from the CWU Yakima WATERS program, have measured the SWE at the DOT Snow Study Site in Snoqualmie Pass, WA. In this study project motivation, sample techniques, potential errors, and results from three years of snow pit data are presented and compared.

A SURVEY OF THE CHEMICAL CONTENT AND MEDICINAL ACTIVITY OF SHRUB-STEPPE PLANTS OF THE PACIFIC NORTHWEST

John, Aaron
Faculty Mentor(s): Gil Belofsky, Chemistry; Audrey Huerta, Geological Sciences

Session: 11
Oral Presentation 11:00-11:20 in Room 137B

A need for new modes of antibiotic therapy has resulted from the increasing incidence of bacterial and fungal resistance to drugs. One approach to this problem involves the search for plant compounds that may help to overcome multi-drug resistance. Many plant genera have been utilized in Native American traditional medicine for their beneficial properties. Such genera include Eriogonum and Collomia, which have been implemented as cold remedies, pain relievers, and antibiotic-related uses. Limited chemical studies of these genera have revealed medicinally useful compounds such as flavonoids and alkaloids, and further research may result in the identification of new plant compounds that could potentially be active against fungal and bacterial infection. Plants native to the pacific northwestern region of the United States, including the genera Eriogonum and Collomia, have been selected for research based on ethnobotany and their previous use in Native American traditional medicine. Several species of these genera have been gathered, purified, and analyzed for the potential of finding new, active compounds that are effective against bacterial and fungal infection. Compounds have been isolated and purified by the use of various methods of chromatography, utilizing thin-layer chromatography to help determine purity, and the use of $^1$H, $^{13}$C, and DEPT nuclear magnetic resonance (NMR) spectroscopy for structure determination. Fractions from different stages of chromatography ranging from the initial extract, to pure compounds were sent to collaborators for bioassay, and upon acquisition of activity from these bioassays, active fractions were the main focus for further purification and chemical structure identification.
JAMES BOND AS VISUAL RHETORIC: A PEDAGOGICAL APPROACH TO THE COMPOSITION CLASSROOM
Johnson, Melissa
Faculty Mentor(s): Melissa Johnson, English

Session: 27
Oral Presentation 1:10-1:30 in Room 137A

As one of the longest running film franchises the James Bond films encapsulate many diverse elements of popular culture, technological advancement and imagination, gender, politics, and more. As such they provide a rich platform to explore critical thinking, argumentation, and academic writing. As a form of entertainment the films engage students initial interest. As an academic tool they allow students to explore many complex ideas and formulate arguments based on multiple perspectives, historical contexts, cultural constructs, and other complex factors. I will explore how these films are incorporated into the composition classroom, how assignments develop out of and around the films, and how student scholarship is shaped through their use.

RESURRECTING A RIVER: A THESIS PROPOSAL FOR EVALUATING THE REINTRODUCTION OF SALMON TO THE ELWHA RIVER AS A MEANS OF INFLUENCING SENSE OF PLACE
Johnson, Kelseyanne
Faculty Mentor(s): Craig Revels, Geography

Poster Session 2: 11:15-1:45 - Poster #11

Located on the Olympic Peninsula in Washington State, the Elwha and Glines Canyon Dams have blocked the Elwha River and, subsequently, salmon runs for nearly one hundred years. The removal of the dams and restoration of the ecosystem is the largest project of its kind in the history of the United States. Although the Elwha River Restoration will continue to impact the surrounding landscape and community for generations, little information is available about the cultural implications of this project. Specifically, little attention has been given to how the return of salmon affects peoples' perceptions of the Elwha landscape. These perceptions of, and attachments to, the landscape are also known as sense of place. Salmon are the driving force behind the transformation of this area. Although salmon are recognized as a cultural keystone species that can bind people to the larger landscape, a lack of information is available about these connections. In addition, a literature gap exists with respect to how these cultural ties influence salmon enhancement programs and policies in the Pacific Northwest. In using an interpretive methodology to interview key stakeholders, this research will evaluate the connections between humans and salmon, and how these connections influence sense of place. In order to implement this methodology, approval from the Human Subjects Review Committee will be required before beginning field work. Accounting for these current, varying connections between people and resources will aid in addressing future restoration challenges.
VARIATION IN PRESENCE OF COMMUNITY DEVELOPMENT FINANCIAL INSTITUTIONS IN WASHINGTON STATE
Johnson, Midori
Faculty Mentor(s): Michael Mulcahy, Sociology

Lynnwood Center Poster Session - Poster #11

Community Development Financial Institutions (CDFIs) provide financial services to underserved populations and economically distressed communities. There are currently 21 certified Community Development Financial Institutions in Washington State. This stage of an ongoing sociological research project, which will examine the effects of Community Development Financial Institutions on poor communities, identifies the specific communities that are served by CDFIs through analysis of census tract-level data. The Treasury Department’s CDFI Fund, which provides financial and technical assistance to CDFIs, has identified which census tracts in Washington State qualify for different forms of CDFI Fund support, and my research identifies which of these census tracts are currently being served by CDFIs. Inclusion in a CDFI’s stated target market will qualify a census tract as one “served” by a CDFI. Identifying census tracts that qualify for CDFI Fund support but are not served by CDFIs and comparing them with those census tracts that are served by CDFIs will provide preliminary data necessary for hypothesizing which variables might facilitate the emergence of CDFIs in poor communities. This research lays the groundwork for further exploration of the presence of CDFIs and CDFI Fund support, as well as subsequent stages of research aimed at understanding the effectiveness of CDFIs in terms of reducing poverty and improving communities.

HUMANITY AND SCIENTIFIC ADVANCEMENT: POTENTIAL HARMONY OR DESTRUCTION
Jonassen, Katelyn
Faculty Mentor(s): Kara Gabriel, Psychology

Session: 32
Oral Presentation 1:10-1:30 in Room 301

As science proceeds, the ethical considerations of using technological advancements is often outpaced by the progress itself and the resultant possibility of altering human existence. Given this situation it is no wonder there has been literature dedicated to various outlooks of the world through a scientific lens, while also addressing a crucial factor: the essence of humanity. As authors depict various scenarios of scientific advancements, and genetic engineering in particular, it becomes clear that the question of how to maintain the ideal of humanity is brought to light. Several components to the question of “what it means to be human” are reflected on in terms of individuality, factors of dehumanization, and the potential for the abuse of power over others in society. With a focus on the literary works Brave New World by Aldous Huxley and The Island of Dr. Moreau by H.G. Wells, these considerations are explored and analyzed while also linked back to the context of present technologies. Given the projected worlds originating in these novels, perhaps considerations for how crucial individuality and self determinism are for humanity will be realized and will play a role in reminding society of potential imperfections and hazards of scientific advancement and genetic engineering.
**EOS**

**Jones, Megan**

*Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences*

*Poster Session 2: 11:15-1:45 - Poster #8*

**Purpose:** Ancient Grecian culture has always intrigued me. With their use of draping and aesthetics they showed their talent using the body as a canvas. Through this garment I wanted to reinvent the sophistication and craftsmanship that the Grecians once mastered.

**Process:** The Greek Goddess Eos has been my inspiration for my entire fashion line because she is described as the hope of a brand new day and a clean slate is what we are all looking for. Following Eos’ fashion, I chose to portray my line with very natural tones in shades of brown, green and ivory.

**Techniques:** In order to create the gown I used the draping method. Some of the elements of the dress such as the Bodice and collar were harder to drape because there was not a set pattern or technique that I had learned and instead I had to resort to using trial and error during the draping process. Pleating was used on the sides of the bodice to show a more full and flowing look. The hardware on the collar was individually hand stitched for more accuracy and stability.

**Materials:** Gauze Cotton exterior, Crepe Back Satin skirt lining, collar interfacing, invisible zipper, hook and eye closures, metal beads, chain. This is one in a line of three garments; the entire line can be seen at the fashion merchandising spring fashion show, *Revolution*, June 4 at 3p.m. and 7p.m. in Milo Smith Theater, McConnell Hall.

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**A DEVELOPMENTAL STAGE-DEPENDENT ROLE FOR CALCINEURIN IN REGULATING NEURONAL CONNECTIONS BETWEEN THE EYE AND THE BRAIN**

**Jull, Ronae; Davis, Jessie; Schultz, Kaytlyn; Felix, Michael; Dworzak, Davy**

*Faculty Mentor(s): Daniel Selski, Biological Sciences; Lucinda Carnell, Biological Sciences; Todd Kroll, Chemistry*

*Poster Session 3: 2:00-4:30 - Poster #6*

Extracellular signals that direct axon outgrowth from retinal neurons to their targets in the brain have been extensively studied, but less is known about the intracellular regulators directing such growth. Understanding which genes direct axon growth of retinal ganglion cells (RGCs) to their specific targets remains an area of intense inquiry, and the chick embryo is an ideal model organism to study such development. Regulatory factors implicated in RGC outgrowth and target recognition include the MEF and NFAT family of transcription factors. In this study we started upstream of these transcription factors, exploring the role of intracellular Calcineurin (CaN) as a key player. We used FK506, a pharmacological inhibitor, to systemically inhibit CaN in chick embryos from day 5 through 13 (E 5-13), when RGCs normally develop. Our lab developed a novel technique for systemic chick treatments in which we injected inhibitors into the air cell of the egg, resulting in significantly improved chick survival, and successful reduction of RGC axon growth to tectal targets. Preliminary data suggest a developmental stage-dependent regulatory role for CaN, with early (embryonic day 5-9) treatment resulting in axon inhibition to tectal targets, and late (embryonic day 9-13) resulting in no RGC axon growth inhibition. In an effort to better understand how CaN regulates RGC axon growth to the tectum, current work is focused on RNA interference methods to knock down CaN as well as CaN’s inhibitor CABIN1 to rescue axon growth.
CIRCLE PACKING TO MINIMIZE NETWORK NEEDS
Kastning, Mary; Rambish, Natalie; Milne, Jason
Faculty Mentor(s): Jim Bisgard, Mathematics

Session: 30
Oral Presentation 1:10-1:30 in Room 201

The age of technology is upon us, so it has become important to understand how to accommodate our expanding population while keeping cost under control. Our model focuses on one portion of this, that is, we focused on the minimum number of repeaters necessary to serve 1,000 simultaneous users, 10,000 simultaneous users, or more, on a VHF radio communication network. Also, we altered our model to accommodate multiple terrain layouts. Very High Frequency (VHF) radio spectrum users communicate using a transmitter and a receiver, on the initial premise that the line-of-sight is the limit of communication without a repeater. VHF radio users outside the line-of-sight are able to communicate through the use of transmission and receiving towers called repeaters. Repeaters receive signals from users and other repeaters, amplify them by 600 kHz, and then retransmit the signal radially. Given an initial circular surface area, the primary goal of this work is to fit uniform subsets of users into smaller circles, called Base Towns so that as much of the total surface area of the initial circle, or City Circle, is accounted for. This process is better known as circle packing. The reasoning behind this approach is to create a network of communication capable of reaching the maximum number of users within the City Circle, while minimizing the number of repeaters, and in doing so, minimizing the cost. Quantitative formulas and qualitative methods have been developed and are shown in the analysis of our model.

AN INVESTIGATION OF SOLUTIONS TO A NON-LINEAR SUSPENSION BRIDGE MODEL
Kastning, Mary
Faculty Mentor(s): Stuart Boersma, Mathematics

Poster Session 1: 8:30-11:00 - Poster #21

In continuation of the work done by Lazer and McKenna, and furthered by Humphreys and Shammas, we categorized solutions to a nonlinear model for a suspension bridge. Earlier results predicted the existence of five different periodic solutions. By examining the long-term behavior of 840,000 different initial conditions, we relied on the numerical solutions generated by Mathematica to identify, save, and color the initial value pairs tested. Thus we have a five color initial position y(0) versus initial velocity y'(0) graph. This graph makes a very interesting pattern.

EDUCATION FOR THEOCRACY IN IRAN
Kaviani, Khodadad
Faculty Mentor(s): Khodadad Kaviani, Education

Session: 14
Oral Presentation 11:00-11:20 in Room 202

Please see the peer reviewed expanded abstract on page 148.
OF CONGESTION AND CONSEQUENCES: AN AERIAL ANALYSIS OF RESIDENTIAL LAND USE AND ROAD SYSTEMS IN NORTHERN VIRGINIA

Keeney, Joe
Faculty Mentor(s): Jennifer Lipton, Geography

Poster Session 2: 11:15-1:45 - Poster #12

The aim of this project is to analyze a portion of a high congestion vehicular-traffic area without the use of population data or driver statistics. State and county planners have a responsibility to the public to regulate residential development at a pace and way that can be reasonably supported by its road system. While it is no secret that the outskirts of Washington D.C. are home to some of the worst traffic congestion in the US, despite the increases in congestion over the years, residential development has continued with insufficient improvements to the current vehicular arteries through the area. I hypothesized that more available housing was leading to increased population, thereby leading to increased vehicles on the road, and therefore sustained congestion. With aerial imagery of two time periods separated by a decade, I used a GIS (Geographical Information System) and air-photo interpretation to extricate quantifiable data of change that might provide evidence as to why congestion has increased over that time period. However, this method resulted by showing an increase of over 250% in the construction of major roads versus nearly a 60% increase in residential development, thereby suggesting other factor(s) contributing to the traffic problems.

ELECTROPHILIC SUBSTITUTION OF AROMATICS WITH 2-PROPYN-1-OL USING IONIC LIQUIDS AS NON-TOXIC SOLVENTS

Kellar, Casey
Faculty Mentor(s): Viorel Sarca, Chemistry; Levente Fabry-Asztalos, Chemistry

Session: 11
Oral Presentation 10:20-10:40 in Room 137B

Green chemistry, also known as sustainable chemistry, refers to the design and use of chemicals and processes that reduce or eliminate substances that are hazardous to humans and the environment. In this relatively new approach to chemistry, emphasis is also placed on maintaining economic viability while minimizing energy use and waste production. Room temperature ionic liquids have attracted a great deal of worldwide interest for use as “green” solvents because they have a low melting point, minimal vapor pressure, low toxicity and can be recycled. The aim of this project was to develop a mild and selective synthetic method for the Electrophilic substitution of aromatics with a propargyl alcohol in imidazolium ionic liquids as a solvent. We employed a readily available metallic triflate, ytterbium triflate [Yb(Tf)3], as a catalyst with [BMIM][OTf]. We are currently performing these reactions under mild conditions: low temperature, high selectivity, and without toxicity, and using common organic synthetic methods. The ionic liquid solvent is recovered and reused in subsequent reactions, this high yields and chemoselectivity result in easy isolation of the propargyl product as well as a new life for this classical transformation.
The USDA recommends two to three cups of vegetables per day for 9-18 year olds. Potatoes are the primary contributor to overall vegetable consumption in adolescents. The average adolescent is consuming 48% of their daily recommended vegetables as potatoes with 40.5% of that amount from fried potato sources. Methods: This study used data from the third School Nutrition Dietary Assessment Study (SNDA-III). SNDA-III, sponsored by the U.S. Department of Agriculture, was a multi-stage, cross-sectional study conducted in the second half of the school year 2004-2005. The sample was stratified and weighted to be nationally representative of all U.S. public schools in the 48 contiguous states. Results: Data from SNDA-III showed larger schools served French fries more often than smaller schools. A similar pattern was observed for fresh fruits and vegetables: larger schools served 3.5 to 5.3 varieties, compared to 1.3 to 1.7 varieties in smaller schools. Schools with the lowest poverty rates (<10% community poverty) were more likely to serve more fresh fruits and vegetables, and served French fries fewer days per week than schools with the highest levels of community poverty (>20%). Schools that served fries more often were more likely to meet the requirements for saturated fat (<10% of total calories), but also tended to be above the total fat maximum (<30% of total calories). The opposite was true in schools that served French fries less often.

Phosphors, used in plasma screens, medical imaging, and LED lighting, are materials that absorb energy and emit light. A promising activator is europium2+ (Eu2+). Depending on the host, this dopant can emit anywhere in the visible spectrum. Literature says that it is difficult to dope Eu2+ into SrB2O4:Eu. This research investigates a new method of making Sr3B2O6:Eu that uses a sample of SrB4O7:Eu2+ as a precursor. If SrB4O7:Eu2+ is used to make Sr3B2O6:Eu, then there should be less Eu3+ and more Eu2+ in the new method sample than in traditional method samples. Traditional method samples of Sr3B2O6:Eu were prepared, as well as samples prepared using SrB4O7:Eu as a precursor. All samples' optical properties were analysed with spectrofluorometry, 270 nm excitation. The ratio of the 611 peak (Eu3+ emission) to the 560 peak (Eu2+ emission) was determined. Samples prepared by the new method had a lower ratio of Eu3+ to Eu2+ emission than samples prepared by the new method. This method may be applied to other phosphors to incorporate Eu2+, such as Sr3Y2(BO3)4:Eu. This method may also be used to create previously unmade novel phosphors.

French-Canadian foot percussion, also known as podorythmie, is a unique method of foot tapping practiced in traditional Québécois, Acadian, and Métis music. Its simplicity and basic rhythmic figures make it versatile in non-standard meters, and the common practice of “accompanying on feet” while playing another instrument makes it difficult to master. Having emerged as part of the musical syncretism of the Native American and French styles, it is singular among similar forms of foot percussion the world over. Unfortunately this practice has been largely overlooked in studies of Canadian folk music, but it is nonetheless becoming increasingly popular in the traditional music scene today and is even giving rise to controversy regarding its role as a solely French-Canadian technique. Opposing views on the subject echo an ever-present debate about stylistic purity in musical traditions.
MODEL OF THE SEASONS
Kratzer, Joshua; Reed, Carly; Fredsti, Feliciti
Faculty Mentor(s): Bruce Palmquist, Physics; Tim Sorey, Chemistry

Poster Session 2: 11:15-1:45 - Poster #20

The purpose for this experiment is to have an effective classroom model to show the relationship between the tilt of the Earth and the seasons at different latitudes. This simple model will show how the angle at which the Sun’s rays hit the Earth’s surface affects the amount of radiation (heat and light) that different latitudes will receive during different times of the year. The design of the model was to build a scale model of the Earth by using a globe. First, light and temperature sensors were placed at specific latitudes on the globe. Then an adjustable stand was built so the angle or tilt of the Earth can be set. Data was taken by placing a heat lamp a distance away from the globe and recording the amplitude of light and temperature variations at different latitudes by changing the angle or tilt to simulate the seasons though a year. Because of the lack of a simulated atmosphere on the model the temperature results were less clear and it took time for the thermal resistance of the sensors to see the variations. The results after testing the light variations of the model were as we expected with some unusual data points due to the type of lenses that were on the light sensors that were used. Using this model in the classroom can show students visually why we have seasons and can possibly be used to show the seasons of other worlds as well.

THE EFFECT OF YOGA TRAINING ON FALL RISK FACTORS IN OLDER ADULTS
Lamb, Tristen
Faculty Mentor(s): Charilaos Papadopoulos, Nutrition, Exercise, & Health Services; Tim Burnham, Nutrition, Exercise, & Health Services; Cody Sims, Nutrition, Exercise, & Health Services

Poster Session 3: 2:00-4:30 - Poster #32

Hypothesis: Yoga training will have a positive impact on risk factors for falls in older adults. Rationale: For older adults, falls are the leading cause of injury-related death. Falls can also cause immediate injury and long-term disabilities. Recent studies suggest that Tai Chi and yoga can decrease fear of falling and occurrences of falls, and improve balance in this population. Methods: Nine older adults (age: 73.4 ± 8.5 years) were randomly assigned to either a yoga (YOGA) or a control (CONT) group. The YOGA group (N = 5) participated in a ten-week, senior-specific Hatha yoga program. The CONT group (N = 4) did not participate in any yoga training but remained active. Subjects completed pre- and post-testing of upper and lower body muscular endurance as well as balance and gait assessments. Subjects also completed a concern for falling questionnaire. A two-way repeated measures ANOVA was used to determine differences between groups over time. Results: The YOGA group had significantly (P < 0.05) increased upper body muscular strength post-training compared to the CONT group. There was a significant (P = 0.03) increase in lower body muscular endurance post-training for the YOGA group. The YOGA group was significantly (P < 0.01) less concerned for falling after ten weeks of yoga, but there was no significant difference between groups for balance and gait. Principle Conclusions: This study suggests that a 10-week yoga class improves upper and lower body muscular endurance while reducing fear of falling in older adults.
GESTURE USE BY FREE-LIVING CHIMPANZEEES (Pan troglodytes) RELATED TO PARTNER ATTENTIONAL STATE
Larsen, Glee; Jensvold, Mary Lee; Campion, Tracy

Both in the wild and in captivity, chimpanzees (Pan troglodytes) use gesture to communicate with each other. The three modalities of gesture that chimpanzees use are tactile, auditory, and visual. Captive chimpanzees use gesture modalities appropriate to the communicative partner’s attentional state. In this study, a communicative partner to a chimpanzee is the target of the communicator’s actions. A partner may be either attending or not attending to the chimpanzee who is gesturing. The hypothesis tested in the present study is that if the partner is not attending, a chimpanzee will use an auditory or tactile gesture, and if the partner is attending a chimpanzee will use a visual gesture. To test this, coders viewed 854 minutes of video of a free-living chimpanzee population in Gombe National Park, Tanzania, and recorded the modality of each gesture as well as the attentional state of the communicative partner. Inter-observer reliability overall, for 6564 total coded gestures, ranged from 85-93%. In the 5452 gestures analyzed, 1.2% were auditory, 84.5% were tactile, and 14.3% were visual. Tactile gestures were significantly more likely to occur when the partner was not attending, and visual gestures were significantly more likely to occur when the partner was attending. No significant difference occurred for auditory gestures. These results indicate that free-living chimpanzees adjust their communicative modality based on the attentional state of their partner, similarly to captive chimpanzees.

THE WHITE ROOM—A SHORT FILM
Larson, Kaitlin

Session: 8
Oral Presentation 8:55-9:20 in Theatre

The White Room is a short film about Patient 23872, who is trapped in a white room, struggling to find an escape and a way to silence the torturous high frequency noise blaring periodically. This sci-fi/thriller will be approximately ten minutes long. During production, the focus will be on the visuals for this intense situation, meaning angles, filters, lenses, etc. will be experimented with. This is also an experiment with audio and audience attachment to films. Hopefully, with the tone, the audience will experience the same discomfort the patient feels, thus accentuating the patient’s pain and eventual decision to silence the noise. This film will also have an additional artistic component. Sequences from the film will be re-created with a graphic novel appearance, but only in the beginning and end. It will start with this graphic novel appearance and slowly transition, first into color and then into live action. Towards the end, the same thing will happen but from live action to graphic novel. I have been working on this project with the help of Dr. Ogden since September 2010. The project has been executed fully as though it were a professional feature film. I started with an outline, developed characters and the story, wrote the script, and did several drafts. I also have been doing the pre-production paperwork, such as creating a budget, schedule, etc. Auditions will be at the start of spring quarter, filming will take place mid-April, and post-production will start directly after filming ends.

INVESTIGATION INTO CWU STUDENTS WEARING CENTRAL SCHOOL ATTIRE
Laush, Kelsey; Lind, Kristine; Rowden, Renee; Whitaker, Jeannine

The purpose is to investigate apparel trends in CWU attire among CWU college students. We will be surveying between 50 to 100 students on campus through written surveys (attached) that the participants will fill out. We will recruit at the SURC and in classrooms with professors’ permission. We will be researching CWU students and asking their class standing as well as gender to identify CWU attire trends. We are using no online surveys for our research.
POWER AND POSSIBILITIES OF MENTORING
Lea, YiShan
Faculty Mentor(s): YiShan Lea, Education

Session: 28
Oral Presentation 1:10-1:30 in Room 137B

Please see the peer reviewed expanded abstract on page 149.

TRAVEL AS A TRANSFORMATIVE EDUCATION
Lea, YiShan; Vilieger, Hannah; Dinwiddie, Michelle; Kiel, Dakota; Milne, Rachel
Faculty Mentor(s): YiShan Lea, Education

Session: 37
Oral Presentation 2:40-3:00 in Room 140

Please see the peer reviewed expanded abstract on page 150.

SPACE USE AND STRUCTURAL ENRICHMENT IN ZOO HOUSED ORANGUTANS
Leeds, Charles
Faculty Mentor(s): Mary Lee Jensvold, Primate Behavior

Poster Session 3: 2:00-4:30 - Poster #42

Structural enrichment is a form of environmental enrichment for captive animals that allows for natural locomotion and behavior. This study sought to examine the current space use of 1.1 Bornean orangutans (*Pongo pygmaeus*) and 1.3 hybrid orangutans housed at the Smithsonian’s National Zoological Park in Washington, DC. The orangutans spent 30.4% of their time on the ground, 41% of their time on existing climbing structures and 28.6% of their time seeking shade. Despite access to only 1 permanent climbing structure and 2 semi-permanent climbing structures, the orangutans spent most of their time in an arboreal state. The orangutans also spent a significant amount of time in their access chute seeking shade. Orangutans are naturally arboreal and live in an environment that is heavily shaded. The creation of more climbing structures and opportunities for shade were developed following this study along with the creation of future exhibit construction guidelines designed to maximize these opportunities for the orangutans. Data collected following the implementation of new structural enrichment found no significant change in space use, however, opportunities to exploit the new structural enrichment were utilized by the orangutans.

ON MONSTERS: A CULTURAL AND LITERARY ANALYSIS
Lehrman, Nathan
Faculty Mentor(s): Lila Harper, Douglas Honors College; George Drake, English

Session: 32
Oral Presentation 1:50-2:10 in Room 301

Different cultures throughout the world have stories that incorporate monsters. These stories invoke the imagination, filling the mind as they do with images of ghastly creatures, unrecognizable forms, and slight wisps of nightmarish memories. In this paper, I argue that monsters in literature are manifestations of the different fears that occur in the cultures that develop the monsters. Mary Shelley’s *Frankenstein*, Bram Stoker’s *Dracula*, and Franz Kafka’s *Metamorphosis* show that literary monsters represent a manifestation of cultural fears. The fears differ with each culture, but all the fears generally represent what the culture is afraid of and what the culture could become.
METABOLIC DEPRESSION AND SEASONAL VARIATION IN SUPERCOOLING POINT IN THE MOUNTAIN PINE BEETLE, *DENDROCTONUS PONDEROSAE*

*Lester, Jack*

*Faculty Mentor(s): Jason Irwin, Biological Sciences; Lucy Bottcher, Biological Sciences; Tom Cottrell, Biological Sciences*

*Session: 12  Oral Presentation 11:00-11:20 in Room 140*

Mountain pine beetles, *Dendroctonus ponderosae*, have experienced significant increases in epidemic outbreak frequency and severity, especially in higher latitudinal and altitudinal extents of their range. Although global climate change may contribute to this trend by raising winter temperature minima above the insect’s lower lethal limit, warm temperatures will also increase energy use during the winter when the beetles are not feeding. This insect does not typically feed following emergence, and low energy reserves have been shown to adversely affect reproductive success. To reduce this effect, we suspected these beetles undergo metabolic suppression through diapause. Additionally, it has been presumed that degree-day accumulation is the only trigger for the resumption of feeding and development in overwintering *D. ponderosae*, leading to the progressive loss of cold hardening. The purpose of this study was: (1) to determine whether *D. ponderosae* undergo diapause and (2) to examine the effect of seasonal progression on supercooling point. The results of this study will contribute to our understanding of the relationship between *D. ponderosae* and climate change, ultimately leading to improved models to predict outbreaks.

INTERNET ADDICTION

*Li, Hui*

*Faculty Mentor(s): Dominic Klyve, Mathematics*

*Poster Session 1: 8:30-11:00 - Poster #25*

In recent years, people have begun to use the internet both as a tool for work and in their personal lives. However, internet addiction appears to be a problem for some users, one which affects people’s lives and can even in some case cause death. Actions such as spending lots of time playing online games is a big problem for college students, and can influence other student behaviors and academic performance. My project is a study of internet addiction among college students. My data concerns seventy-six college students’ use of the internet for four primary reasons: interpersonal function, information function, leisure function, and virtual emotion function. I am doing some methods to analyze these data, such as sorting the data to take away any outliers and invalid numbers. Then I compare the mean to see which variable are the most effective ones for predicting internet addiction. Also, I use multiple regression to predict internet addiction. Finally, I use a t- test by gender to see how easily girls or boys are to be an internet addictive user. I summarize the variables in the data both graphically and numerically in my project.

TOMMY CO. WASTE REDUCTION STRATEGY

*Liao, Tommy*

*Faculty Mentor(s): Kun Liao, Finance & OSC*

*Lynnwood Center Poster Session - Poster #7*

With the cost of goods continuously increasing world wide, companies are stepping up their efforts to implement cost saving measures to reduce cost and eliminate waste. Supply chain management techniques such as lean manufacturing have become a focus point in modern manufacturing companies. Tommy Co. is a company that produces a variety of tissues and wipes for personal to commercial use. Recent analysis have shown that the amount of waste created during the manufacturing process creates zero value to the company. By looking into upgrades or replacement tissue machines, Tommy Co. can reduce the amount of waste created during the manufacturing process.
“FUTCH”: CONSTRUCTING A BUTCH IDENTITY IN A FEMININE WORLD

Lindquist, Jessica
Faculty Mentor(s): Pamela McMullin-Messier, Sociology

Session: 14
Oral Presentation 10:40-11:00 in Room 202

Gender is a socially constructed concept that is present in our culture and often presents problems for those that do not identify or express themselves using the standard dichotomy of heterosexual male and female. Pursuing the effects of breaking the gender binary is important because large communities across the globe do not fit inside this binary, and their voices and stories deserve to be recognized. Also, in order to build a strong community of LGBTQ allies, it is important to bring to light the experiences of living outside the gender binary. Utilizing a literature review of queer theory and gender construction theory, as well as an in-depth case study of myself, I was able to uncover the impacts of the gender binary on my life as a butch lesbian. This became about more than just male and female, but something that transcends both of those. I concluded that gender expression, sexuality, and states of being are fluid in nature, even for a “butch” masculine lesbian. The limitations of this are understanding, and language; it can often be difficult to translate an LGBTQ experience into heteronormative terms. Another difficulty is explaining why the binary does not need to exist, when it is so engrained in society. I believe my case study could help further the field of study by bringing to light the experiences that exist somewhere between butch and femme lesbianism.

THE ACUTE EFFECT OF CAFFEINE CONSUMPTION ON RESTING METABOLIC RATE

Liu, Ziyang; Papadopoulos, Charilaos; Pritchett, Kelly; Pritchett, Robert
Faculty Mentor(s): Charilaos Papadopolous, Nutrition, Exercise, & Health Services

Poster Session 3: 2:00-4:30 - Poster #31

The majority of research has suggested that caffeine increases resting energy expenditure from 4 to 24 hours. The acute effects caffeine on resting metabolic rate have not been well documented. PURPOSE: To examine the thermogenic effect of caffeine on resting metabolic rate employing a double-blind, cross-over study. METHODS: Fifteen individuals were recruited. Participants completed two resting metabolic rate measurements, one with placebo (PLB) and the other with caffeine (CAFF) each separated by one week. Participant completed a 30-minute resting metabolic rate prior to supplementation. After the 30-minute, participants consumed either CAFF or the PLB (5 mg/kg of body weight) and resting metabolic measurements resumed for another 60 minutes. Energy expenditure (kcal/min) was calculated and averaged every 10 minutes. A two-way repeated measures ANOVA was used to evaluate differences between treatments over time for energy expenditure and respiratory exchange ratio (RER). RESULTS: Energy expenditure and RER prior to supplementation were not significantly different between CAFF and PLB. There was a significant (p=0.02) treatment by time interaction and post hoc analysis further revealed that energy expenditure was significantly (p<0.01) higher for CAFF compared to the PLB between 10 to 60 minutes. There was also a significant (p<0.01) treatment by time interaction and post hoc analysis showed that the respiratory exchange ratio was significantly (p<0.05) higher for CAFF compared to the PLB between 10 to 20 minutes. CONCLUSION: The results of this study suggest that caffeine increases energy expenditure 10 minutes after consumption. Caffeine increased RER 10 minutes after consumption alluding to increased carbohydrate utilization between 10 and 20 minute post-caffeine consumption.
COSTCO INVENTORY MANAGEMENT AND QUALITY MANAGEMENT SYSTEM
Lomboy, Rowena
Faculty Mentor(s): Kun Liao, Finance & OSC

Lynnwood Center Poster Session - Poster #3

This research focuses on the inventory management system and quality management system at the Tacoma Costco Warehouse. Currently, managers are facing inventory shrinkage and inaccurate inventories at the warehouse. Some major factors that cause inventory shrinkage and inaccurate inventories are thefts, employees missing items during check out, and employees not paying attention to their job tasks. This research is on how Costco can improve inventory management and quality management systems to assure the inventory accuracy. The goal of this research is to find ways to reduce the loss of inventories and improve the inventory management and quality systems. By using quality management and inventory management principles, this study proposes two solutions to prevent the loss. The first is to set up a POS system when the items are received from the distribution center. This is important as the employees at the distribution center may not have counted the inventories accurately. Moreover, managers should pay attention to profit margin reports. If the margin is not accurate, research should be done immediately.

PACCAR AND LEAN SIX SIGMA: OVERCOMING DIFFICULTIES TO REALIZE SUBSTANTIAL BENEFITS WHEN IMPLEMENTING NEW LSS PROJECTS
Lorenzo, Roemer
Faculty Mentor(s): Kun Liao, Finance & OSC

Lynnwood Center Poster Session - Poster #4

Lean and Six Sigma are two of the most powerful forces in manufacturing and supply chain management today. Lean manufacturing, a production practice that considers any expenditure of resources that does not contribute value to the end-user is wasteful, thus is the target of elimination. Six Sigma, a quality improvement methodology, generally seeks to reduce process and results variation. When combined, Lean Six Sigma can improve the manufacturing process by optimizing downstream flow that continuously provides consistent results, with less just-in-case inventory and improved lead times. In which overall achieves positive bottom line results and ROI, and ensures customer satisfaction. Although, integrating Lean Six Sigma projects into the manufacturing and supply chain process is not an easy feat; as experienced by the Six Sigma Teams at PACCAR, collaborating and motivating all parties (e.g. variety of functional department employees, vendors, and suppliers) that will be directly involved in the project to accept and adapt the change, and the direct and opportunity costs associated when implementing a new project (e.g. overtime and delay in production due to Kaizen training), occasionally the benefits of implementing a new Lean Six Sigma project does not outweigh the costs. Therefore, a Lean Six Sigma project can be scrapped. With the information provided by PACCAR’s Six Sigma Team, this study will illustrate the process of implementing an LSS project; analyze the difficulties and costs associated; and provide new approaches and solutions to successfully integrate a LSS project to an existing manufacturing process or business activity at PACCAR.
**DEVELOPMENT OF ALTERNATIVE DIFFERENTIAL STAINING TECHNIQUE FOR STUDIES OF SOAP LAKE BACTERIA**  
*Lu, Shao Yeh*  
*Faculty Mentor(s): Holly Pinkart, Biological Sciences*

**Session: 29**  
**Oral Presentation 1:50-2:10 in Room 140**

The ability to differentiate bacteria based on their cell wall structures is an important first step to characterize and study bacterial species. As the most common bacterial light microscopy-based differentiation method used in bacteriology, little has changed for the Gram Stain method since its first introduction in 1883. Bacteria with a thick cell wall retain the primary stain (purple) in this technique and are referred to as “Gram positive”, while cells that have a membrane external to the cell wall retain only the secondary stain (red), and are termed “Gram negative”. Due to the unusual chemical nature of Soap Lake (Grant Co., WA), bacteria isolated from it are often observed to stain inconsistently using the Gram Stain technique. The purpose of this project was to develop an alternative differential staining method that can differentiate two groups of bacteria with the different cell envelope structures. An aqueous staining solution containing wheat germ agglutinin (WGA) and horseradish peroxidase (HRP) selectively targets exposed N-acetylglucosamine and N-acetylneuraminic acid residues found on Gram positive bacteria. The reagent 3’,3’-diaminobenzidine was combined with different metallic ions such as Cobalt (II) chloride, Copper (II) sulfate, and silver nitrate with WGA-HRP solution to produce stains of various colors. Four well-characterized bacteria, and sixteen Soap Lake bacterial strains with known cell wall structures were stained with the WGA-HRP technique, and all were correctly identified.

**ANTIBODY PRODUCTION AND IMMUNOFLUORESCENCE USING A MONOCLONAL ANTIBODY THAT RECOGNIZES HAMSTER MAJOR HISTOCOMPATIBILITY ANTIGEN II**  
*Lubahn, Heather; Jurges, Erich*  
*Faculty Mentor(s): Gabrielle Stryker, Biological Sciences; Blaise Dondji, Biological Sciences*

**Poster Session 3: 2:00-4:30 - Poster #12**

Hookworms are intestinal parasitic nematodes infecting about a billion people mainly in developing countries. Hookworm infection leads to anemia, weight loss, and learning and developmental disabilities. A laboratory model of the disease using hamsters has been developed. Previous research has suggested that hookworm infection impairs antigen recognition by T cells. To elucidate the role of hookworms in the impairment of antigen processing/presentation, reagents to detect major histocompatibility antigen (MHC) class II are required. However, this infection is not supported in mice for which there are a plethora of reagents, necessitating our development of reagents to study this system in the hamster. Toward this goal we have purchased the hybridoma cell line 14-4-4s (ATCC HB-32) that produces a monoclonal antibody which has been reported to recognize hamster MHC II. We have grown this cell line in the lab and collected the antibodies it produces for testing on MHC II+ cells from Syrian hamsters (*Mesocricetus auratus*). The HB-32 hybridomas were initially cultured in conventional media, containing fetal bovine serum, to establish the cell line. Once the cells were established they were weaned onto hybridoma media without serum, and therefore no bovine antibodies. HB-32 antibodies were then collected and concentrated to be used for further testing. Immunofluorescence is currently being used to determine whether the HB-32 monoclonal antibody will serve as a useful reagent to measure MHC class II expression on hamster cells.
REGIONAL TRENDS OF SCHOOL PSYCHOLOGISTS IN WASHINGTON STATE

Lund, Golda

Faculty Mentor(s): Dr. Gene Johnson, Psychology

Poster Session 1: 8:30-11:00 - Poster #37

A statewide survey was conducted to examine the current demographics and characteristics, roles, implementation of Response to Intervention (RTI), and identify regional trends in the implementation of RTI by practicing school psychologists in Washington State. The program Survey Monkey was utilized, and there was a total of 406 respondents out of 798 accurate electronic mail addresses yielding a fifty percent response rate. The results indicated that the majority of school psychologists in Washington State are White/Caucasian, female, and have Masters/Specialist degrees. Assessments, including report writing and meetings, were identified as the role that encompasses the most time. Approximately 34% of respondents indicated that the schools that one is currently involved in are implementing RTI. A regional trend to the implementation of RTI was identified with the data analysis of chi square. Area 5 (counties Lewis, Pacific, South Grays Harbor, South Mason, and Thurston) and Area 10 (counties Adams, Asotin, Benton, Franklin, Garfield, Walla Walla, and Whitman) had statistically significant associations between location of practice as identified by regions and the implementation of Response to Intervention, Pearson $\chi^2$ (12, N = 332) = 47.414, $p = .001$. This presentation will focus providing the observer with further information pertaining the role and function of school psychologists in Washington State. Specific attention will be paid to the implementation of RTI in Washington's public education system.

CENTRAL WASHINGTON UNIVERSITY SOURCE ROCK MUSIC VIDEO—TURN IT UP!

Lupton, Robert; Norrish, Winston; Lupton, Alexandra; Larsen, Allen

Faculty Mentor(s): Robert Lupton, Information Technology & Administrative Management

Session: 42
Oral Presentation 2:40-3:00 in Theatre - Poster #

This entry captures the Central Washington University SOURCE experience through an all original music track and After Effects video. “Turn It Up” was written by Dr. Winston Norrish, CWU Geology Department along with video production by Dr. Robert Lupton, CWU Information Technology and Administrative Management (ITAM) Department. The goal was to create excitement and awareness through perfect lyrics, pounding drums and screaming guitar licks as well as fast moving video clips of previous SOURCE presentations. Research of other music videos and audio tracks lead the authors to After Effects video software, Pro Tools audio editing software, and Big Fat Drums (BFD) plug-in software. Research also dedicates, especially in the sciences, that faculty and students must maintain objectivity rather than subjectivity when conducting scholarship. “Turn It Up” is about the degree of this continuum between objectivity and subjectivity. The song captures the essence that too often folks hold on too closely to their ideologies and beliefs, rather than fully opening up to explore the world in an objective manner. Remaining objective allows one to see more; to see clearer. Just like SOURCE allows us to grow through diverse presentations of scholarly endeavors and creative expression. Open your mind and “Turn It Up!” Recorded by Winston Norrish, Robert Lupton, and Alexandra Lupton. Audio Mix by Engineer Allen Larsen, Cascade Productions.

CHAPTER 4: STRUCTURES OF GOVERNMENT FROM THE STUDENT GENERATED TEXT: THEY CALL IT DEMOCRACY: REPUBLICAN GOVERNMENT IN EUROPE

MacDowell, Jonathan

Faculty Mentor(s): Rex Wirth, Political Science

Poster Session 1: 8:30-11:00 - Poster #28

A poster presentation using the conceptual frame work for Chapter 4: Structures of Government from the student generated text: They Call It Democracy: Republican Government in Europe. The poster illustrates how structures of government influence the distribution of power in a state. It will consist of three tables: (1) Fiscal distribution, (2) Formal Distribution (3) A combination of the previous two tables to show how power is distributed in practice.
Black Carbon (BC), also known as soot, is formed from incomplete combustion of bio and fossil fuels. BC is transported from emission sources by the wind, and can be deposited on snow glaciers. When Black Carbon (BC) is in the snowpack, the albedo or reflectivity is reduced allowing more light to be absorbed instead of being reflected, which can accelerate snow and ice melt. Using snow samples collected from a one meter deep snow pit on the Blue Glacier on July 13, 2010, and surface snow samples in the Blewett Pass area from January-February 2011, Black Carbon concentrations in the Washington snowpack were determined using a Single Particle Soot Photometer (SP2). The BC data will be used to look at spatial variations in BC and to assess how far away from the road snow samples should be collected to minimize BC contamination from local vehicle emissions.

CHAPTER 5: EUROPEAN COURTS AND JUDICIAL REVIEW FROM THE STUDENT GENERATED TEXT:
THEY CALL IT DEMOCRACY: REPUBLICAN GOVERNMENT IN EUROPE
Madson, Jon
Faculty Mentor(s): Rex Wirth, Political Science

A poster presentation using the conceptual frame work for Chapter 5: European Courts and Judicial Review from the student generated text: They Call It Democracy: Republican Government in Europe. Judicial review appears on the surface as a simple concept. However, there are a variety of systems for completing the process. The poster will illustrate the varying styles and methods of judicial review within select countries of Europe. Countries examined will include Great Britain, France, Germany, Poland, Bulgaria, and Russia. The United States of America will also be included in order to have a point of comparison which most people are familiar with. The influence of the European Court of Justice and how it affects the process of judicial review in European countries will also be examined.

HIGH SATURATED FAT DIET ACTIVATES REACTIVE OXYGEN SPECIES PATHWAYS IN
C. ELEGANS
Magana, Maya
Faculty Mentor(s): Lucinda Carnell, Biological Sciences; Carin Thomas, Chemistry

Mitochondrial dysfunction has been linked to the development of type II diabetes. Evidence suggests that high fat diets lead to mitochondrial dysfunction via the generation of reactive oxygen species (ROS). The roundworm, Caenorhabditis elegans is a well-established model for studying metabolism. Nicotinamide nucleotide transhydrogenase (NNT), is a mitochondrial inner membrane protein that is important in the ROS scavenger pathways, and mutations in the nnt-1 gene have been associated with the development of type II diabetes. Studies comparing effects of high saturated and unsaturated fatty acid diets in wild-type nematodes and a mutant strain with a deletion in the nnt-1 gene have shown an increase in superoxide anion production in worms fed a saturated, but not unsaturated fatty acid diet. We have evidence that superoxide is being converted into hydrogen peroxide (H$_2$O$_2$) and activating oxidative stress pathways. Transgenic animals that contain a glutathione transferase translational fusion (gst-4::gfp) showed increased fluorescence intensity on a high saturated fat diet indicating induction of transcription in response to oxidative stress, specifically H$_2$O$_2$. GST-4 is responsible for catalyzing the transfer of reduced glutathione to detoxify compounds as part of a Phase II oxidative stress response. A cross between the mutant strain, nnt-1, and the gst-4::gfp strain will be generated to determine whether an increased activation of H$_2$O$_2$ dependent pathways occurs on high saturated fat diets. We will examine other cellular pathways that may be regulated by high fat diets by measuring gene expression levels for genes involved in beta oxidation, fatty acid storage and mitochondrial biogenesis.
In radiation therapy it is important to know the accuracy of the planning and delivery system when treating patients. One method of testing the equipment in radiation clinics for accuracy is to compare the planning system and delivery equipment of the clinic to those of other clinics. Task group 119 of the American Association of Physicists in Medicine designed several tests to compare the dose planning and the delivery systems of several clinics around the country. These tests consist of common IMRT (Intensity Modulated Radiation Therapy) treatment plans as well as IMRT treatment plans that have difficult objectives. Task Group 119 used these tests to generate a quantitative Confidence Limit (CL) value that is used to compare the IMRT planning and delivery systems at different facilities. These tests were performed at WVMC and analysis of the data resulted in CL values for the film measurements that were slightly outside the standard deviation of the clinics reported by Task Group 119. The analysis of the data for ion chamber measurements resulted in CL values that were within the standard deviation of the clinics reported by Task Group 119.

Freshwater mussels are surprisingly one of the most endangered groups of species on the planet, with widespread population declines increasing over the last century. These mussels, in addition to their historic importance as valuable Native American resources, have been shown to improve water quality by controlling nutrient levels and reducing turbidity. With a unique reproductive strategy relying on a "host" fish to incubate and disperse their larvae, freshwater mussels are dependent on one or many species of fish for survival and population growth. The Western Ridged Mussel (Gonidea angulata) is listed as imperiled in Washington State; it is a species of special concern in mussel research due to declining populations and a lack of complete reproductive cycle information. My study will reveal which fish species in the Yakima River Basin are suitable hosts for this mussel, filling a data gap for G. angulata and building a pathway for potential conservation efforts. I will combine a laboratory experiment to identify larval infection rates in potential host fish with field observation techniques to conclusively determine G. angulata’s fish hosts.

1-Butyl-3-methylimidazolium hexafluorophosphate was tested as an ionic liquid phase transfer catalyst in the conversion of 1,1,2-trichloroethylene (TCE) into 1,2-dichlorovynil-akyl ethers. The reaction of TCE was performed in mild conditions: low temperature, and without toxicity to show the advantages of using ionic liquids as “eco-friendly” substances, which are non-toxic, non-volatile, non-flammable, and non-explosive. The high yields coupled to easy isolation of the 1,2-dichlorovynil-alkyl ether products and recycling/reuse of the ionic liquid, provide a new life for this classical transformation.
CENTRAL WASHINGTON UNIVERSITY COMMUNITY BUYING BEHAVIOR: A COMPARATIVE STUDY
Martin, Lindsay; Okamura, Emily; Sanders, Will; McCorkle, Matt
Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management

Session: 5
Oral Presentation 8:30-8:50 in Room 201

Our research observes the consumer buying behavior of Central Washington University (CWU) students on the Ellensburg campus, and our analysis will determine what correlations there are between the different behavior types. The question we are trying to solve with this study is how changes in CWU students buying behavior in recent years has influenced business from local store owners in downtown Ellensburg. The main bodies of evidence that have been considered for this study are transportation types, locations, source of income, age, influences on behavior patterns, employment, and product vendor type. What we hope to gain from this study is a better understanding of how current buying behaviors have changed in CWU students and be able to track factors that influence such changes in their behavior. From this data, we hope to present the findings of our research to local store owners within Ellensburg so that they can better adapt their businesses to the changing behavior of CWU students.

ESTABLISHING AND MANAGING AN UNDERGRADUATE WRITING JOURNAL: CENTRAL WASHINGTON REVIEW
Martinson, Matt; Gornik, Charles; Greene, Brian; Doug, Mitchell; Ruppert, Amy
Faculty Mentor(s): Loretta Gray, English

Session: 2
Oral Presentation 8:50-9:10 in Room 137A

At least forty-three universities across the United States sponsor undergraduate writing journals to encourage and publish student writing. In addition, undergraduate research and graduate mentoring have both become central components to curricula and pedagogy on American university campuses (Gonzalez, 2001). It is against this backdrop that a group of English graduate students teaching composition, with support from faculty in the Department of English, are establishing the Central Washington Review (CWR), an online forum for undergraduate writing and critical discussion. The presentation of this project will address several aspects of creating and managing CWR that include: 1) the pedagogical and theoretical concerns germane to undergraduate writing instruction, 2) the ways in which CWR can assist student writers in meeting university writing program outcomes, 3) the process for soliciting and editing written submissions to CWR, 4) the technological challenges and pedagogical potential of utilizing an online platform for the journal, and 5) the practical and theoretical knowledge about teaching undergraduate writing that will be gained by graduate students and faculty serving on the CWR editorial staff.
American actress Charlotte Cushman (1816-76) was one of the most well-known stage actresses of the nineteenth-century. Thus far, scholarly attention has focused mainly on the biographical details of her personal life, rather than her influence on and adaptation of masculine and feminine theatrical professional roles, more specifically her unique and pioneering approach to breeches roles, or her significance as an actress-manageress. Her work can be seen as non-conformative to both contemporary engendered and heteronormative ideals and values. Often Cushman distinguished herself in strong, masculine roles, such as Shylock in *The Merchant of Venice*, or as the head of a theatre company. Her navigation of work and roles outside of the typical “norm” established by other prominent stage actresses like Sarah Siddons, or by manageress Madam Vestris, makes Cushman an excellent source for continued scholarly research. By examining and analyzing Cushman’s production journals, contemporaneous reviews, correspondence with other actors, and personal financial documents one can better understand the unique and atypical opportunities Cushman was able to establish for herself and ultimately better understand the significance her overall career has in theatre history. In this paper I will discuss the highlights of my research and discoveries on Cushman from my Master’s thesis in Theatre Studies.

Modeling world health: statistical analysis on the associations of health-related factors

McDonald, Chloe
Faculty Mentor(s): Dominic Klyve, Mathematics

In recent history, health care reform has been an issue of particular political interest and the cause of intense debate in our country. While it may seem like Americans are now putting more thought into the health of our country than ever before, there are still many statistical and numeric resources indicating the strengths and weaknesses of other health care systems around the world which are not being utilized to help better our own system. Regardless of which system of health care a country employs, it is presumed that the overarching goal of all health-related policies around the world is to ensure and maintain the health of a country’s citizens. Associated with the overall health of a country are many different indicators, ranging from health expenditures and the prevalence of smoking, to the incidence of life-threatening diseases and life-saving immunizations. Upon analyzing the health of individual countries, several trends become apparent. These trends lead to questions surrounding the significance of such trends and what implications they might have. Typically, the study of health-related figures for countries around the world is directly associated with the initiative of lengthening life expectancies for the citizens of such countries. This report will focus on the relationships between such factors as fertility rates, prevalence of smoking, health expenditure, and life expectancy in the hopes of determining which indicators have the most impact, and in particular are the most beneficial, to the status of health in individual countries.
A gene map is a basic characterization of a genome, and it is important to understand the strengths and weaknesses of different mapping techniques. Two commonly used approaches involve 1) the assembly and gene identification using shotgun sequencing data or 2) physical mapping based on Southern hybridization. Shotgun sequencing has become the norm because a computer program does the mapping, so it is relatively fast and easy, and information in addition to the map is recovered. However, a physical map remains the “gold standard” for gene mapping. In theory the two approaches should produce the same map, however in practice this has not been tested. We have mapped the chloroplast genome of *Podocarpus macrophylla* by shotgun sequencing, and by physical mapping, and there are inconsistencies between the two maps; however the two maps were produced from different samples. A true test would involve the generation of the two types of maps from the same DNA sample. Therefore, I am producing a physical map from the *Podocarpus macrophylla* DNA sample that was used to prepare the shotgun-sequencing map. If the physical map does not match the sequenced-based map, it will indicate that errors may be occurring during sequence assembly and computer mapping.

This study seeks to investigate the possible neural sources of complex tone processing. Moreover, it aims to investigate whether there is a hemispheric bias in spectral discrimination. Using previously acquired brain activation data (event-related potentials, ERP) during several complex tone discrimination tasks, this study utilized Standardized low resolution brain electromagnetic tomography (sLORETA) to localize electrical brain activity of complex tone processing. sLORETA is a modern noninvasive method (computer software package) for localizing electrical activity in the brain. The study expects to find a stronger right vs. left hemisphere activation to complex tone processing that is localized to regions of the auditory cortex. This research has implications on the successful use of source localization methods to determine the complex nature of brain electrical activity during cognitive processing.

The need for a fast, routine, and acellular way of measuring oxidative stress potential of ultrafine particles (UFPs) led to the work of optimizing experimental parameters of a glutathione assay that will be validated in the current project. To that end the assay is reproduced and tested using soot particles of various composition and structure, which are representative of ambient UFPs. The resulting oxidative potential will then be compared with a commercially available toxicity kit (Mitoscan). The bulk of the work consists of wet chemical laboratory techniques combined with the use of a UV-Vis spectrophotometer. Results so far indicate that UFPs do oxidize the critical GSH molecule and the compared results will tell if this is a convenient indicator of their toxicity.
ANTHELMINTIC ACTIVITY OF PLANT EXTRACTS ON THE HOOKWORM ANCYLOSTOMA CEYLANICUM

McNutt, Sarah; McClellan, Krystal; Berndt, Amanda; Moesch, Stephanie
Faculty Mentor(s): Blaise Dondji, Biological Sciences; Gil Belofsky, Chemistry

Poster Session 3: 2:00-4:30 - Poster #5

Parasitic hookworms are one of the most common infections in the world, infecting over 600 million people worldwide, mainly in impoverished areas. The current predominant approach to treating hookworm is periodic deworming with benzimidazoles. However, the frequent treatment of populations with this drug has lead to a significant problem of drug resistance which is largely irreversible. Thus, efforts are moving towards developing new drugs and vaccines. We are developing assays to test the anthelmintic effect, defined as the ability of test samples to kill helminth worms. Specifically, we will test organic compounds extracted from the plants Oemleria cerasiformis, Adenocaulon bicolor, Dais cotinifolia, Collomia grandiflora, and others. The anthelmintic activity on the adult hookworm Ancylostoma ceylanicum is measured by observing their motility after exposure to a drug.

STRESS AND THE CWU STUDENT: EXPLORING STRESS AND OTHER VARIABLES IN A COLLEGE SAMPLE

McPhaden, Anna
Faculty Mentor(s): Rebecca Pearson, Physical Education, School and Public Health

Poster Session 3: 2:00-4:30 - Poster #38

Background: Stress is an important factor in health outcomes, and literature suggests relationships between stress and other characteristics common among college students. Purpose: The purpose of the study was to determine if, for our sample, relationships exist between stress level and physical activity, sleep patterns, and other variables. Methods: Students in a health assessment class surveyed approximately 200 CWU students regarding stress and possibly related variables. As a group, we chose to research the relationships between stress and physical activity, sleep, and other variables. In addition to the literature, we used our experiences as college students to help us decide on important questions. Approximately 195 students submitted completed surveys. For this survey, we used rating, ranking, nominal, and Likert style questions to help us assess the stress of the participants; we then used chi square, and t-tests to analyze the data collected. Results: We found that there was a significant relationship between stress levels and average hours of sleep, with students who sleep less reporting higher stress level. Conclusions: In conclusion, these and others of our results might be able to aid professionals working with college students to design strategies to help them lower or cope with stress.

HABITAT SELECTION OF NORTHERN ALLIGATOR LIZARDS NEAR A PROPOSED WILDLIFE CROSSING BRIDGE AT I-90

Meidell, James; Beck, Daniel; Garvey-Darda, Patty
Faculty Mentor(s): Daniel Beck, Biological Sciences

Session: 12
Oral Presentation 10:20-10:40 in Room 140

The effect of roads on low mobility species is difficult to assess due to the inconspicuous nature of these organisms. Many low mobility species are being studied as part of the I-90 expansion project. The purpose of this study was to determine the population structure of Northern Alligator Lizards (Elgaria coerulea) at the Price-Noble Creek proposed wildlife bridge along with features of their habitat which influence their presence. We used pit-fall arrays placed in various habitat types to capture lizards. We identified lizards with pit-tags and toe clips. We marked areas where lizards were seen in the open and compared them to randomly located sites within 100 meters of each lizard sighting. We characterized the habitat of sighting locations and randomly located sites. We also characterized the habitat surrounding all buckets in pit-fall arrays. We found a significant association between decreasing canopy cover and increasing lizard captures in pit-fall arrays. We also found that rock cover was significantly associated with lizard presence when comparing locations of lizard sightings to random locations. In this area Northern Alligator Lizards may be associated with areas of low canopy cover as part of a behavioral strategy for thermoregulation. In other studies rock cover was found to be a preferred source of shelter for this species. This study will serve as a baseline for comparison with future studies of the crossing structure to determine the effectiveness of wildlife bridges in facilitating migration and gene flow for low mobility species in this area.
DETECTION OF RADIOISOTOPES FROM THE FUKUSHIMA DAIICHI NUCLEAR PLANT DISASTER

Mendoza, Cesar; Affholter, Randle
Faculty Mentor(s): Anne Johansen, Chemistry; Michael Braunstein, Physics

Poster Session 1: 8:30-11:00 - Poster #9

The recent disaster at the Fukushima Daiichi (FD) nuclear power plant in Japan that commenced with the March 11, 2011, earthquake has resulted in the emission of radioactive particulate matter (PM) into the atmosphere that reached the west coast of the United States within a few days. To estimate the amounts of radioactive PM that reached Kittitas county, we collected particles in 4 size fractions on the roof of Dean Hall starting on March 16, 2011, 4 days after the first explosion at FD. The collection device is a High Volume Cascade Impactor (HVCI) equipped with polyurethane foam (PUF) substrates that prevent particle bounce for a high mass loading capacity. Collection occurs at ~900L/min and was performed over one to three week intervals. A NaI(Tl) scintillation gamma ray spectrometer was used to detect and obtain estimates of radioisotopes present in the HVCI samples. We obtained definitive signals of 131I and 132Te radioisotopes, along with possible detection of others. These observations are consistent with the types of releases expected from FD and detected by other monitors in the United States.

OPTIMAL HALFPIPE SHAPE

Mendoza, Adriana; Andersen, Noah; Dean, Raven
Faculty Mentor(s): James Bisgard, Mathematics

Poster Session 1: 8:30-11:00 - Poster #20

Over the course of this competition we have developed a model that determines how much mechanical energy a snowboarder loses while traveling down a halfpipe of a given shape. The curve that loses the least amount of energy would produce the greatest vertical height, because the total mechanical energy that the snowboarder begins with would be transferred to potential energy at the height of the jump. Of the three components of a halfpipe that contact and influence the snowboarder, we sought to optimize them independently. We found that the optimal vertical and the flat bottom components of the halfpipe were dependent on the snowboarder’s skill as well as how large the halfpipe was. So we focused primarily on the transition of the halfpipe to optimize the halfpipe’s shape. We developed a model for energy lost on the transition and found that a half circle is the curve that produces the greatest vertical height, because it had the minimal energy lost out of all of the functions we tested.

ROMANTIC DUO: TWO SIDES OF THE ENGLISH CHANNEL

Miles, Brian
Faculty Mentor(s): Carrie Rehkopf, Music

Session: 25
Oral Presentation 12:00-12:20 in Theatre

This presentation will reveal the results of my project sponsored by the CWU Foundation through the C. Farrell Scholarship for the Fine Arts/Research. The original proposal included producing a recital program and scholarly presentation that would explore new areas of Fine Arts Performance execution and recital formatting. The research element was conducted on musical scores, and the recordings of the eminent period performers of two Romantic Period Violin Sonatas, composed within a few years of each other and sharing—as well as contrasting—many characteristics. The program sought to enlighten the audience of historical and personal contexts of the world-at-large and the composers respectively, at the time of compositional gestation, in order to impart a deeper understanding of the music itself when I actually performed the works in their entirety. This proposal was aimed at both the frequent concert-goer as well as persons completely new to classical music, and was thusly inspired by the Chicago Symphony Orchestra’s Beyond the Score concert series. The program uniquely combines elements of music performance, drama, and modern audio-visual presentation techniques in order to contrast with the traditional recital form and stimulate more diverse interest in the audience. The personal challenges for me were vast and included public speaking and musical performance, as well as the challenge of organizing and creating a large, fluid, and effective presentation that would satisfy the goals I set for myself in the beginning.
BILLIE JEAN
Miller, Grant
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Poster Session 2: 11:15-1:45 - Poster #9

Purpose: The purpose in creating this piece was to make a pair of jeans that were good looking and fit well. I was inspired by the fit of many popular straight leg jeans, but wanted to explore the different possible aesthetics of the jeans. Reversing the denim fabric on different parts of the jeans created a contrast between the two different colors and the flannel pockets and liner allow for different possible looks of the jean. Process: Creating these jeans was a long process. To create the initial stylistic look of the jeans I did extensive research on current and traditional mens jeans. Once started on the pattern there were many revisions and additions of details. Getting the leg fitting just right was a trial and error process. This is what I focused on to get the aesthetics I wanted to achieve. Techniques: The jeans were created by flat-patterning. Once the pattern was created a sample was made, fitted, alterations to the sample were made and the final product was created. Materials: Denim, wool flannel, denim thread, heavy duty button. This is one in a line of three garments; the entire line can be seen at the 15th annual fashion merchandising spring fashion show, Revolution, June 4 at 3p.m. and 7p.m. in Milo Smith Theatre, McConnell Hall.

THE FIRST 9 THz LASER EMISSION GENERATED BY OPTICALLY PUMPED CH$_3^{18}$OH
Milne, Jason
Faculty Mentor(s): Michael Jackson, Physics

Session: 3
Oral Presentation 8:50-9:10 in Room 137B

This year marks the fiftieth anniversary of the laser, and hence, fifty years of laser innovation (House Resolution 1310). LASER is an acronym for Light Amplification by Stimulated Emission of Radiation. At the time of its discovery, critics ironically dubbed the laser as “the solution in search of a problem.” The laser has proven to be just that. Today lasers are integrated in all aspects of our lives: at the checkout counter, in defense and medical applications, they are even used in laser light shows for entertainment. The laser project at Central Washington University involves the discovery of new sources of light in the far-infrared region, spanning wavelengths from 20 to 1000 micron. For this project, a carbon dioxide laser was used to excite a far-infrared laser that operates using an isotope of methanol. Once a far-infrared laser emission was detected, its frequency was measured using a heterodyne (mixing) technique yielding a fractional uncertainty of a few parts in ten million. During this investigation, four new far-infrared laser lines were discovered and twelve laser frequencies were measured for the first time. This includes the discovery of the 33.15 micron laser line whose frequency is the first 9 THz laser emission generated by this laser medium. These newly discovered and measured laser lines have expanded the frequency range for which this laser operates by a factor of three. This presentation will focus on discussing the experimental system and the process involved in the discovery and frequency measurement of far-infrared laser lines.
PROSODIC TRANSFER FROM L1 SPANISH TO L2 ENGLISH IN AMBIGUOUS SENTENCES

Mitchell, Doug
Faculty Mentor(s): Charles Li, English

Session: 19
Oral Presentation 12:00-12:20 in Room 137A

When specific prosodic elements of a speaker’s first language are transferred to the speaker’s second language, the comprehensibility of speech is impaired. This study examines the extent to which three prosodic features of Spanish transfer to English, and the effect these transferred elements have on a listener’s understanding of ambiguous sentences. In order to examine these issues, a native Spanish speaker recorded twelve ambiguous sentences, each of which contained a sentence-final prepositional phrase that could attach either to the preceding subject noun phrase or to the preceding verb phrase (e.g., The spy saw the thief with the binoculars). The speaker attempted to communicate both meanings of each sentence, yielding twenty four sentences in total. Three prosodic elements of these readings, intonational phrase boundaries, contrastive stress marking, and nuclear pitch accent, were then compared to the same elements of a native English speaker’s reading of the same sentences. This study then describes the extent to which the native Spanish speaker’s prosody transferred to English and the effect that transfer had on the comprehensibility of the speaker’s English sentences.

TEEN SMOKING
Mo, Yasi
Faculty Mentor(s): Dominic Klyve, Mathematics

Poster Session 1: 8:30-11:00 - Poster #22

Cigarette smoking among American teens is always a big problem. Recently, some statistics show that the number of teen smokers has been declining more slowly than the past years. Other data suggests that there may be some benefit in dividing teen smokers into subgroups for the purposes of analysis, based on gender, college plans, etc. After several years of studying teen smoking, there are interesting trends in the levels of teen smoking among these subgroups. The goal of this report is to find the relationship of these subgroups and the teen smokers, and to determine which groups of teens are most likely to start smoking.

THE SPEED OF HAPPINESS: ELUCIDATING THE MECHANISMS OF SEROTONIN-DEPENDENT LOCOMOTORY BEHAVIOR IN C. ELEGANS
Moen, Spencer
Faculty Mentor(s): Lucinda Carnell, Biological Sciences

Session: 21
Oral Presentation 12:00-12:20 in Room 140

Caenorhabditis elegans (C. elegans) is a free-living microscopic roundworm commonly used as a model organism to study the genetic basis of behavior. Serotonin (5-HT) is a neurotransmitter that modulates behavior across species. Acute 5-HT exposure decreases locomotory speed in C. elegans while chronic long-term exposure to 5-HT leads to a! recovery of locomotory speed referred to as behavioral adaptation. Adaptation is an important consideration in therapeutic drug use and many neurological diseases, in which organisms are exposed to chronic elevated levels of 5-HT or drugs that mimic it. Little is known of the underlying mechanisms that lead to adaptation and we therefore initiated a genetic screen to identify mutants that fail to adapt to the inhibitory effects of 5-HT on locomotion. We mutagenized animals with the chemical mutagen ethyl methanesulfonate and then tested their progeny on plates for mutant worms that fail to adapt to 5-HT after an overnight exposure. Our initial screen of 1200 mutant worms identified two mutant worms. We have begun to characterize one of the mutants in more detail. In addition to defects in adaptation to 5-HT, this mutant displays an interesting behavior on food, as a population this mutant migrates across a bacterial lawn as a dense formation consuming the entirety of the bacteria as they move; we refer to this behavior as depressed foraging (def). We are currently mapping the location of the mutation in order to clone the gene responsible for this behavior and the control of happiness.
The Role of Interleukin-5 in Hookworm Infection

Moesch, Stephanie; Dondji, Blaise
Faculty Mentor(s): Blaise Dondji, Biological Sciences

Session: 4
Oral Presentation 8:50-9:10 in Room 140

Geohelminth infections including hookworm are among the most common infectious diseases of humans with up to 2 billion people at risk in developing countries. In children, anemia and protein malnutrition resulting from chronic hookworm can cause growth delay, intellectual and cognitive defects. Human and animal studies suggest that infection with these intestinal parasites is associated with suppression of the host immune response including effect on host cytokine production. Interleukin-5 (IL-5), a cytokine involved in the maturation/differentiation of eosinophils has been shown to play a role in resistance to hookworm and other worm infections. In order to further identify the role of IL-5 in hookworm infection, we conducted experiments where the antibody TRFK-5 was used to inhibit IL-5 production in hamsters. The animals were infected with 75 third stage larvae of Ancylostoma ceylanicum hookworm. A group of hamsters received the antibody TRFK-5 three days before infection and at day 7 and 14 after infection and the second group got the control antibody. Infected hamsters that received TRFK-5 showed higher worm burden and weight loss than those not injected with TRFK-5. Egg count was assessed and shown to be higher in the TRFK-5 group at 21 days post infection (5411 ± 174 versus 3400 ± 200 in non TRFK-5 group, p = 0.001). Hemoglobin levels were assessed to determine anemia and TRFK-5 injected hamsters were determined to be more anemic at 21 days post infection. Together, these data confirm that IL-5 plays an important role in the host immune defense against hookworm.

Emerald City Smoothie: Point of Sales System

Moore, Monica
Faculty Mentor(s): Kun Liao, Finance & OSC

Lynnwood Center Poster Session - Poster #9

This study investigates how Emerald City Smoothie (ECS) can more accurately record sales, reduce shrink, have consistent pricing between locations, and have better records of goods sold. Emerald City Smoothie is a nutritional store that sells health food products like protein supplements, snack bars, fat burners, and prepares fresh fruit and protein smoothie drinks. Currently at the Kent, Washington, ECS locations, all sales are manually punched in by employees and variations occur. No detailed record exists of when and what items were sold; just the number of “snacks,” “vitamins,” “boosters,” or “smoothies” are recorded every day. Shrink from employees has become more frequent. No point of sales (POS) system is in place and in this study we will explore how a POS can solve a variety of operational and record-keeping problems. With a POS system, ECS will be able to have a more accurate return on investment statement because there will be a record of inventory, and an accurate count of damaged, stolen, or discounted items. An inventory record will also reduce shrink because currently missing items go unnoticed. With a POS system, managers to be able to see what items sell faster and have more knowledge on what and when items should be reordered. Also a POS system will reduce price variations from different store locations thus providing more efficient and accurate sales entry.

After Hour Non-Alcoholic Hang-Out Spot for Ages 18 to 25 in Ellensburg

Morris, Rachael; Dymerski, Mikhail; Lukomski, Olivia; Mullen, AJ
Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management

Session: 5
Oral Presentation 9:10-9:30 in Room 201

For our presentation we are looking into the need of a non-alcoholic after-hours hangout spot for students between the ages of 18 and 25 in Ellensburg. We thought this was a good topic for a study because of the lack of under-age places for students who want to hangout late at night in Ellensburg. We wanted to find out if students between 18 and 25 think that there are no after hour hangout spots. Also, we wanted to find out if an after-hours hangout spot was provided if they would use it, and what they would like to see the establishment offer. To find out this information from the students, we distributed a written and online survey that asked the questions stated above.
ELECTRONIC SHELF MANAGEMENT SOLUTIONS

Morrison, Jim
Faculty Mentor(s): Brandi Harrington, Information Technology & Administrative Management

Session: 24
Oral Presentation 12:30-12:55 in Room 301

The next major innovation in the retail grocery industry will be the implementation of electronic shelf labels; enabling the retailer to make instantaneous price changes, reduce labor costs, improve stocking efficiency, eliminate pricing errors and increase customer satisfaction. The market is huge. The 100 largest convenience store chains in the United States alone have a need for over 258 million labels. The technology is established and already popular in Europe and Asia but has been slow to be implemented here. One reason is a lack of knowledgeable and affordable vendors. The proposed business plan is to create a company that will become the solution source for convenience store retailers wanting to install electronic shelf labels. The business will offer a full array of services; from consulting, to training, to full installation and follow-up. By creating a strategic partnership with the manufacturer, the proposed company will be able to purchase labels in quantities and at discounts comparable to the largest chains. Passing this savings on to the retailer adds value and incentive to convert to the new labels. The principal officer of this Limited Liability Corporation combines over 30 years of successful retail and project management experience with a current information technology degree and a passion for helping others succeed. Once established, the concept will be franchised nationally.

CWU NATIONAL TRUMPET COMPETITION TRUMPET QUINTET B PERFORMANCE - CYCLONE BY ERIC MORALES

Mrozinsky, Andrew; Morgan, Thomas; Pulse, Nathan; Bull, Brian; Whitson, Casey
Faculty Mentor(s): John Harbaugh, Music

Session: 17
Oral Presentation 10:00-10:20 in Theatre

My trumpet quintet was selected as one of 30 university trumpet ensembles from across the country to perform at the National Trumpet Competition in Fairfax Virginia. It was a fantastic honor for us to represent Central Washington University and the fine Music Department that CWU has. We performed our piece entitled Cyclone by Eric Morales in front of several of our collegiate peers at a national level of competition and played very well. It took our quintet six months of preparation and rehearsal to send in a recording to a blind audition and be selected to perform. It was a tremendous honor for our quintet to travel and represent CWU.

FASCH CONCERTO FOR TRUMPET

Mrozinsky, Andrew
Faculty Mentor(s): John Harbaugh, Music

Session: 17
Oral Presentation 10:40-11:00 in Theatre

I was selected from a blind audition process as one of 45 undergraduates from across the country to perform as a soloist at the 2011 National Trumpet Competition in Fairfax, Virginia. It was a tremendous honor to be selected, and to represent Central Washington University. It took several months for me to prepare and to get my audition tape ready to send in. It was a lot of work, but well worth it for the opportunity to perform and compete at a national level. I met a lot of my peers from across the country, and several professionals in the field of music, it was a great experience.
IDENTIFICATION OF NEOCORTICAL PROTEINS THAT INTERACT WITH THE TRANSCRIPTION FACTOR Sp8
Mullan, Michael
Faculty Mentor(s): Todd Kroll, Chemistry

Poster Session 1: 8:30-11:00 - Poster #10

The neocortex of the brain controls conscious decision making and movements in mammals and is divided into separate functional areas during embryogenesis through a process called neocortical arealization. This process is mediated by a specific class of proteins called transcription factors, which turn particular genes on and off. While numerous key transcription factors regulating neocortical arealization have been identified, the authentic mechanism by which these proteins control their target genes remains a mystery. A common theme with transcription factors, however, is that they often collaborate with other transcription factors to determine which genes are turned on at given times, with this cooperation frequently being mediated by physical interaction between these proteins. Following this concept as a guide, we are searching for proteins that interact with the transcription factor Sp8, a protein that plays a critical role in the development of the anterior motor area of the neocortex. Here, we will report the initial findings we obtained from a yeast two-hybrid screen using Sp8 as “bait” to screen a library of “prey” proteins generated from embryonic mouse neocortical tissue. This screen has revealed several potential binding partners for Sp8 that may regulate its action during neocortical development.

IDENTIFICATION OF SPOILAGE BACTERIA IN WASHINGTON WINE
Nakamura, Yusuke
Faculty Mentor(s): Holly Pinkart, Biological Sciences

Session: 29
Oral Presentation 1:30-1:50 in Room 140

Many people like drinking wine. If its taste is good, wine lovers would love to drink more. Unfortunately, contaminating bacteria can produce spoilage, which decreases quality of wine. A recent survey of 180 Washington wines resulted in isolation of 100+ spoilage organisms, most of which were only identified to genus level. In order to identify them to species level, we have to isolate each species using culture techniques to produce pure cultures containing only a single species. From previous work, we know these bacteria belong primarily to two genera, Pediococcus and Lactobacillus. Pure cultures were confirmed using brightfield microscopy. Pure cultures were then grown in liquid media with different sugars because each species has unique fermentation patterns, allowing identification based on these patterns. With those results, the species definitively identified to date are Pediococcus pentosaceus. Additional strains likely belong to the species Lactobacillus paraplantarum, L. planetarum, and L. hamsteri, but those are not confirmed yet. Work on species identification of additional wine bacteria is ongoing.
Immune Response in Mice to Co-Infection with Different Species of *Leishmania*

*Nation, Catherine*

*Faculty Mentor(s): Gabrielle Stryker, Biological Sciences; Blaise Dondji, Biological Sciences*

**Poster Session 3: 2:00-4:30 - Poster #11**

*Leishmania* is a genus of single-celled parasites that is transmitted through the bite of the sand fly. These parasites can cause disfiguring disease [cutaneous leishmaniasis (CL)] and even death [visceral leishmaniasis (VL)] in infected individuals and often occur in epidemics due to environmental changes such as deforestation, urbanization, and migration due to economic or political unrest. The significance of these diseases has led to a tremendous body of work to better understand the immune response to these parasites. Study of *Leishmania* has contributed to the field of immunology due to the polarized immune responses seen in protection versus susceptibility. It is known that previous exposure to dermotropic species of *Leishmania* protects against subsequent infections of the same species, yet it unknown if previous exposure to any dermotropic species of *Leishmania* will have an effect on subsequent infections with viscerotropic species or vice versa. My project aims to take advantage of this vast knowledge of *Leishmania* immunology to ask what effect previous infection with one species of Leishmania has on secondary infection to another species of *Leishmania*. I will observe the immune response in mice under different infection conditions, i.e. co-infection and single species infection with *Leishmania major* and *Leishmania infantum*. I will determine the disease outcome of previous exposure to a *Leishmania* species in infection with a different one by looking at host cytokines by Real Time Quantitative PCR and the parasite burden using limiting dilution method.

Central Washington University Observatory Modifications

*Neal, Colby; Lawler, Andrew*

*Faculty Mentor(s): Michael Braunstein, Physics*

**Poster Session 2: 11:15-1:45 - Poster #22**

The CWU observatory 0.3 m telescope has been modified by incorporating a new flip mirror, a new electronic filter wheel equipped with 2 inch Kron-Cousins UBVRI filters and updating the operating software for the CCD camera. The flip mirror was designed and constructed to meet the requirements of a larger filter wheel. Key design parameters include structural integrity and an increase in the aperture in the optical path through couplings with increased inner diameter and a mirror with larger area. In addition to describing the new instrumentation, we will characterize the system with several sets of data. We will present and describe a full set of calibration images, composed of the standard dark current, bias and flat-field calibrations, as well as a marginal ray flat-field correction. We will present results obtained from the modified telescope with images of a range of astronomical objects.

Sex in Ancient Greece: Exploring the Dynamics of Marriage and Pederasty

*Nelson, Reesa*

*Faculty Mentor(s): Matthew Altman, Douglas Honors College*

**Session: 32**

**Oral Presentation 2:10-2:30 in Room 301**

Food, water, and a safe place to live have been some of the crucial basics that all societies need in order to flourish. Beyond these most rudimentary physical needs, there is also the essential requirement to reproduce to carry on the paternal lineage. The fundamental necessity of legitimate heirs precipitated the need for a marriage contract between men and women. Before settling down and marrying a woman, ancient Greek men often participated in sexual exploration and social mentorship through the practice of pederasty. Ancient Greek society had a direct and honest discourse about the indispensable nature and pleasure of sex in its many forms. We find examples of this viewpoint in literature, art, mythology, and the defined cultural norms of the time.
COMPARING AND PREDICTING ANDROID SMARTPHONE UPGRADES

Nesbitt, Alex

Faculty Mentor(s): Dominic Klyve, Mathematics

Session: 38
Oral Presentation 3:20-3:40 in Room 201

In the past few years, smartphones have exploded in popularity, with 300 million smartphones shipped last year. Consumers have many choices of phones, but choosing the right one can be a daunting task, especially with the wide variety of Android-powered smartphones in the market today. The focus of this report is the Android Operating System itself, specifically the distribution of upgrades that include new functionality, security fixes, and improved reliability. When a customer commits to a two-year contract with a new Android phone, they must also consider when (or if) that phone will be upgraded to a newer version of the Android operating system. The chance and timing of an upgrade can be predicted when the user considers the smartphone’s manufacturer, wireless carrier, and other variables.

OVERTIME RESTAURANT

Newell, Justin; Marmesh, Wade

Community Mentor(s): Gregg Marmesh

Session: 24
Oral Presentation 11:40-12:05 in Room 301

When the clock of your daily grind strikes double zeros there is only one thing to do, head to Overtime! The only place you’ll find that captures the true experience of sports in the purest form. At Overtime, the clock never stops, the bar is always flowing so you don’t ever have to worry about taking the last shot. We will put you in the front row with the thundering sounds and flashing lights of every Seahawks touchdown to the buzzer beaters from your favorite Pac 10 basketball team. Imagine a place that rolls the World Series, the NBA finals, and the Super Bowl into one. You will be in sports heaven when you sit down at the central circular bar made of hard wood and look up at the stadium style jumbotron. With an appetizer menu based around everyone’s favorite sports arena foods you will never have a reason to buy an overpriced ticket again. You always win in Overtime, because we put you in the game.

BOEING INVENTORY MANAGEMENT

Nguyen, Tony

Faculty Mentor(s): Kun Liao, Finance & OSC

Lynnwood Center Poster Session - Poster #6

Boeing Company is involved in many different sectors of airspace. They are mostly known for but are not limited to, delivering commercial planes, military aircraft, and space systems. In order to be an industry leader, they must always be on top of tools and inventory. Boeing Co. uses a system called Integrated Management System that is built to integrate suppliers where it offers supplies and maintenance when needed. Although there are many systems to combat inventory issues, workers find it difficult to get parts for projects on time. Many workers in recent interviews complain about how time is an issue to order specific parts needed to finish a project. I propose that Boeing needs to have an improved system by reducing the time it takes to deliver requested supplies to different sections more quickly and efficiently. This in turn will allow employees to finish jobs quicker and be more productive with their time.
THE USE OF COLOR VERSUS BLACK-AND-WHITE IMAGES IN A DELAYED-MATCH-TO-SAMPLE (DMTS) TASK
Niegoski, Amanda; Ring, Ian; Huss, Kathryn; Mariscal, Carina; Loesken, Axel
Faculty Mentor(s): Kara Gabriel, Psychology
Poster Session 1: 8:30-11:00 - Poster #32

Previous research has shown differences between men and women in cognitive tasks, particularly in tasks involving spatial skills and object memory. For example, men prefer coordinate-based directions while women tend to use landmark-based strategies; differences which may be due, in part, to women outperforming men in memory for objects that can be verbally labeled. The current study focused on the use of color cues in learning and memory performance in both genders in a Delayed-Match-To-Sample (DMTS) task. Male (n=27) and female (n=61) undergraduates at Central Washington University received extra credit for participation. Participants were asked to memorize sample screens, consisting of four images that appeared either in black-and-white or color, followed by a blank white screen of delays of 0, 10, 30, or 60 seconds, and then were asked to find the repeating image among three new images in a comparison screen. Overall, women had higher accuracy and lower response times than did men. In particular, color tended to aid accuracy in women but not men at the 60 second delay (representing long-term memory). Data collection is ongoing and results may provide information on how men and women differ in their attention and memory for specific environmental cues.

USING VARIATIONS IN GARNET COMPOSITIONS TO QUANTITATIVELY INTERPRET TEMPERATURE AND PRESSURE OF HIGH-PRESSURE METAMORPHIC ROCKS
Oduber, Kurtis
Faculty Mentor(s): Chris Mattinson, Geological Sciences
Poster Session 2: 11:15-1:45 - Poster #17

Garnet is a key mineral in interpreting the temperature and pressure of formation of igneous and metamorphic rocks. Garnets are also very resistant to alteration and the slow diffusion of elements in garnet compared to other minerals allows it to preserve compositional zoning, acting as a black box would on an airplane, recording previous assemblages that were in equilibrium as the rock makes its way deeper into the crust. My research revolves around the garnets in a high-pressure granulite from the Dulan region of China. I used an Electron Microprobe (EMP) to map out the compositions of the garnets, and their related mineral assemblages. The variation in garnet composition also leads to different end-members of the same mineral, manganese (Mn), iron (Fe), and magnesium (Mg) are all element specific end members of the garnets and each represent a dependence on those specific elements during their formation. A program called GTB was used to calculate and plot the pressures and temperatures that the garnet along with other co-existing assemblages, were subjected to during metamorphism. Based on the GTB calculations the pressure and temperature was around the order of 725-790°C and around 12-14 kilobars. Along with the varying garnet compositions, a plot of clinopyroxene compositions were compiled to also show a change during metamorphism of another minerals end-members. Aswell as plotting the compositions of garnets and clinopyroxenes in the granulite, a total alkaline-silica diagram was constructed in order to better understand what kind of rock the high-pressure granulite was before metamorphism began.
IBSEN'S PERFECTLY DYSFUNCTIONAL FAMILY

**Orndorff, John**  
Faculty Mentor(s): Ruthi Erdman, English

Session: 41  
Oral Presentation 3:20-3:40 in Room 301  

Almost every culture has defined gender roles which are meant to describe the proper stations of male and female individuals within society. One common historical explanation for these gender roles is that they are essential for a properly run household, that without these strictly defined positions, a home, and therefore society at large, would collapse. These gender roles have become integrated within almost every society, and violating them immediately labels an individual or a family as strange. In his play, *A Doll’s House*, Henrik Ibsen highlights the explicitly separate domains of man and woman. By showing how heavily enforced these roles are within the Helmer family, then following the collapse of that family, Ibsen calls attention to the reality that strict gender roles are not required to create a functional family, and that they can often be detrimental to the overall wellbeing of a family unit.

SWIFT’S WOMEN

**Orndorff, Jessica**  
Faculty Mentor(s): Ruthi Erdman, English; Gerald Stacy, English

Session: 41  
Oral Presentation 3:40-4:00 in Room 301

Though Swift appears to have conflicting attitudes towards women, he is actually progressive for his time period. Through *Gulliver’s Travels*, the reader can see that Swift believes women are more capable than his society accepts. It is a matter of education, stigmas, and rules that determine if a group will be subjugated or rise above that, since hierarchies are artificially imposed. Through Gulliver’s interactions with the Lilliputians, Brobdingagians, and Houyhnhnms, Swift illustrates that women are capable creatures and what is considered the “nature” of women may not in fact be their true nature. Most critics have assumed that Swift was dismissive of women, but a closer examination shows that women are satirized just like men.

TRICHLOROETHYLENE, THE SILENT MASSACRE

**Pace, Terri**  
Faculty Mentor(s): Rex Wirth, Political Science; Matthew Altman, Douglas Honors College

Session: 26  
Oral Presentation 1:50-2:10 in Room 135

I believe that it is deprivation of human rights when human suffering and sacrifice is caused by environmental degradation. Powerful government agencies stood against “Victims of TCE” when they attempted to change the status of trichloroethylene to carcinogenic. A quagmire of policies have been created that cannot possibly be waded through in time to determine if a simple glass of water is too poisonous to drink. We have the right to know when something is hurting us. Toxins that we ingest and breathe do harm us and those children who have yet to be born. The studies that have focused on the latent damage from trichloroethylene make it logical to assume that the statute of limitations in most states, in regards to this toxin, are unfair and unreasonable. TCE is not the only substance that has violated our environment leaving it unfit for us to live around. To get to the root of this problem and set the context, I will look at social movements which have formed because of environmental blunders involving toxins and studies that have proven disease caused by toxins could be carried to future generations. Let me introduce you to a new idea and to a possible new Bill to clear the way for a cleaner, safer and healthier environment for a brighter future for our children.
EXPLORING THE PAST TO UNDERSTAND THE PRESENT
Palmeri-Miles, Amber; Browitt, Lisa
Faculty Mentor(s): Jason Irwin, Biological Sciences

Poster Session 2: 11:15-1:45 - Posters #38A-B

Eighth-grade social studies students from Walter Strom Middle School in the Cle Elum/Roslyn School District investigated landmarks in Roslyn and Cle Elum through inquiry based science. These students are part of the National Science Foundation's GK-12 program which places graduate students in elementary through high school classrooms to enhance the state curriculum with hands on inquiry based science. Our GK-12 program, called the Watershed Activities To Enhance Research in Schools (or simply WATERS) focuses on the Yakima River Watershed. As part of the WATERS program eighth-grade students have worked in groups to incorporate descriptive, comparative, and correlative natural science field investigations to gather data on local landscape features. Each group will present their investigations of existing and historical landmarks to make connections between the past and the present to form relationships with where we find ourselves now. Some examples of places and issues students are exploring include the economic impacts of Suncadia (a new resort built near Roslyn) and the potential impact the proposed Teanaway Solar Farm on Cle Elum and Roslyn.

INQUIRY BASED FIELD RESEARCH IN THE SEVENTH-GRADE CLASSROOM
Palmeri-Miles, Amber; Griswold, Trish; O’Connor, Killian; Hyatt, Shayna; Johnson, Cody; Bilyeu, Sammy; Wallace, Brooke; Burroughs, Delaney; Terrill, Holly
Faculty Mentor(s): Jason Irwin, Biological Sciences

Poster Session 2: 11:15-1:45 - Posters #39A-G

Seventh-grade science students from Walter Strom Middle School in the Cle Elum/Roslyn School District have conducted inquiry based field research projects. These students are part of the National Science Foundation's GK-12 program which places graduate students in elementary through high school classrooms to enhance the state curriculum with hands on inquiry based science. Our GK-12 program, called the Watershed Activities To Enhance Research in Schools (or simply WATERS) focuses on the Yakima River Watershed. As part of the WATERS program seventh-grade students have worked in small groups to conduct comparative and correlative natural science field investigations. Each group has worked together to develop testable hypotheses, collect data throughout multiple seasons, analyzed their data and observe patterns in their data to form relationships on how their projects changed throughout the seasons. The outdoor research projects ranged from abiotic investigations like the distance sound travels, air temperatures in open canopy versus closed canopy, or soil temperatures at various depths. Biotic investigations ranged from tree heights on flat versus sloped area in a uniformly aged stand to bird food preference of two distinct food compositions.
MIDDLE SCHOOL STUDENTS CONDUCT CONSERVATION RESEARCH BY TRACKING TOADS
Palmeri-Miles, Amber
Faculty Mentor(s): Jason Irwin, Biological Sciences

Poster Session 2: 11:15-1:45 - Posters #37

Sixth, seventh, and eighth-grade students from Walter Strom Middle School in the Cle Elum/Roslyn School District have become an integral part of a Master’s of Science project at Central Washington University (CWU) examining the seasonal movement patterns of Western Toads (Anaxyrus boreas) adjacent to Interstate-90 (I-90). These students are part of the National Science Foundation’s GK-12 program which places graduate students in elementary through high school classrooms to enhance the state curriculum with hands on inquiry based science. Active members of the Walter Strom Middle School Watershed Club have the opportunity to participate in a CWU Master’s of Science research project. Currently, Washington’s Department of Transportation (WSDOT) is working on an expansion project to widen I-90 in the Snoqualmie Pass area and will be incorporating animal crossings above and below the road surface. Western Toads are good candidates for amphibian movement studies because they are known to migrate between breeding sites, summer foraging ranges, and overwintering sites, and travel long distances relative to their size. Approximately once a month, middle school students who are active participants in the Watershed Club are selected to radio track Western Toads. These data will be incorporated into a Master’s of Science thesis project at CWU and provided to WSDOT. In addition to collecting data, students have been filmed and interviewed while conducting fieldwork. A short documentary is being assembled that will be used to educate community members about the importance of wildlife conservation and demonstrate Walter Strom Middle School’s connection with local environmental issues.

INVENTIONS OF BEAUTY AND TRUTH
Pantea, Leah
Faculty Mentor(s): Maya Chachava, Art; Keith Lewis, Art

Poster Session 1: 8:30-11:00 - Poster #43

For Winter and Spring 2011 quarters I was granted the C. Farrell Scholarship in the Fine Arts. The Jonathan Safran Foer novel Extremely Loud and Incredibly Close inspires my collection, Inventions of Beauty and Truth. In the novel, a character imagines inventions that bring people closer together and more connected. I have been illustrating two-dimensionally and fabricating three-dimensionally through metal working some of these inventions. My works are intended for all audiences, as the inventions are focused towards universal emotions and feelings, such as loneliness, vulnerability, the difficulty of expressing oneself and above all the universal connection between all humans. I have been illustrating using two non-traditional processes. Through the layering of semi-transparent and transparent papers, I can add a unique depth to some of my illustrations. In addition, through working with mineral spirits with oil paints and graphite, I can create depth in an image through the movement of forms within a painting. Through my metal work, I have been using sterling silver to push the ideas from the novel into actuality. I will display some of my works as well as images displaying the process that I have been working with as a preview to the upcoming show in June.
MOBILE PHONE TECHNOLOGY AND ITS EFFECT ON AFFECT: A REPLICATION STUDY

Parker, Joshua; Gregory, Brianne
Faculty Mentor(s): Susan Lonborg, Psychology; Kara Gabriel, Psychology

Poster Session 1: 8:30-11:00 - Poster #38

In recent years there has been an exponential increase in the use of mobile phone technology by the majority of the world, and because of this observation many researchers pose that this sort of technology demonstrates addictive properties. In order to investigate mobile phone dependence and problem use as it relates to anxiety, the present study aims to demonstrate links between levels of trait anxiety and mobile phone dependence and problem use, as well as to examine the hypothesis that the absence of a person’s mobile phone will lead to increased levels of experienced state anxiety by the individual. Fifty undergraduate students served as the preliminary sample and were divided between two conditions, with one group having no access to their mobile phones for the duration of the study period. Both groups were given counterbalanced questionnaire packets containing measures of state and trait anxiety (State-Trait Anxiety Inventory and State-Trait Inventory for Cognitive and Somatic Anxiety), mobile phone dependence/problem use (Mobile Phone Problem Use Survey, Short Message Service Problem Use Diagnostic Questionnaire, and Cell-Phone Over-Use Scale), a measure of social desirability (Social Desirability Response Set™ 5 Item), and a questionnaire collecting demographic and mobile phone use information. The results offer preliminary support that a positive correlational relationship exists between trait anxiety and mobile phone dependence, and that state anxiety is increased by the removal of the mobile phone. Additional data have been collected in order to offer further analysis of the hypotheses.

A COMPARATIVE ANALYSIS OF NATURAL AND HUMAN-MADE ROCK HABITATS FOR AMERICAN PIKAS ALONG INTERSTATE 90 IN THE CENTRAL WASHINGTON CASCADE RANGE

Parks, Raychel; Ernest, Kristina; Garvey-Darda, Patricia
Faculty Mentor(s): Kristina Ernest, Resource Management; Karl Lillquist, Resource Management

Poster Session 2: 11:15-1:45 - Poster #28

American Pikas (Ochotona princeps) are small mammals that occupy natural talus (an accumulation of broken and fallen rocks at the base of a cliff or slope) and other rocky habitats in mountainous areas of western North America. In the Washington Cascades, pikas have been found living in human-made rock habitats, including both road-fill along highways and riprap (rock material placed along stream banks for stabilization), as well as in natural talus. Washington State Department of Transportation (WSDOT) plans to build a number of wildlife crossing structures including bridges and overpasses in this area that will help wildlife safely cross the highway. Our objective was to provide WSDOT with data on pika habitat features that could be incorporated into the crossing structures to improve their suitability for pikas. In this study, we compared the ecological characteristics and pika use of natural and human-made rock habitat along I-90. Multivariate statistical analysis was used to identify differences in habitat characteristics between pika-occupied and unoccupied sites, and among natural talus, road-fill, and riprap patches. Overall results show that there are significant differences among habitat types and between occupied and unoccupied sites. These results suggest that unoccupied rocky habitats are different in some features compared to occupied habitats. Common features among different habitat types occupied by pikas, and differences between occupied and unoccupied sites, will provide critical information to WSDOT in their design of wildlife crossing structures suitable for pikas.
STIRRING THE POT: BUILDING THE SCHOLARSHIPS OF APPLICATION, TEACHING, AND ENGAGEMENT THROUGH A COMMUNITY KITCHEN

Pearson, Rebecca
Faculty Mentor(s): Rebecca Pearson, Physical Education, School and Public Health

Session: 40
Oral Presentation 3:20-3:40 in Room 271

Please see the peer reviewed expanded abstract on page 151.

A GRIMM DISCOVERY: THE ORIGINS AND DEVELOPMENT OF MODERN ENGLISH FRICATIVE SOUNDS

Penland, Trevor; Borst, Erick
Faculty Mentor(s): Xingzhong Li, English

Session: 19
Oral Presentation 12:20-12:40 in Room 137A

In the course of our linguistic study of the history of the English language (ENG 423), we became interested in understanding how Modern English came to possess nine fricative sounds when Proto-Indo-European (around 3700 BCE), from which English was derived, possessed only one fricative: the voiceless alveolar [s]. By studying the origins and development of this class of consonant sounds, we hope not only to further our education of linguistic research methodologies but also to better appreciate the sound structures of Modern English. In order to research this question, we had to analyze various reconstructed morphological forms of Proto-Indo-European and Proto-Germanic found in the works of historical linguists, such as Grimm’s and Verner’s, to see how the Modern English fricative sounds have historically evolved from about a 5,000 year time span. We discovered that Proto-Germanic developed eight additional fricative sounds from Proto-Indo-European, as Grimm’s Law and Verner’s Law show, and then that Middle English replaced three of these new fricative sounds with three other different fricative sounds borrowed from non-Germanic languages.

FUNCTIONAL FIBER EFFECTS ON POST PARANDIAL GLUCOSE IN HEALTHY INDIVIDUALS USING A CONTINUOUS GLUCOSE MONITORING SYSTEM

Penn, Kelsey; Dow, Shireen; Prichett, Kelly; Hawk, Susan; Gee, David
Faculty Mentor(s): David Gee, Nutrition, Exercise, & Health Services

Poster Session 3: 2:00-4:30 - Poster #34

The effects of postprandial glucose and second meal effects of psyllium fiber and ultra high viscosity hydroxypropylmethylcellulose (UHV-HPMC) was examined using a randomized single blind crossover study. Thirteen healthy active individuals were administered 4g of fiber supplement or a placebo prior to consumption of a standardized pre-measured breakfast meal. A continuous blood glucose monitoring system (CGMS) (DexCom Seven Plus, San Diego, CA) was used to analyze blood glucose concentrations for up to 180 minutes after the consumption of the standardized breakfast and lunch meals. The area under the curve (AUC) was compared to find blood glucose concentrations following the breakfast meal. Blood glucose of the UHV-HPMC AUC was 40% less than the control AUC ($P < 0.05$). Peak glucose of both UHV-HPMC and psyllium post breakfast was 25% and 21% less, respectively, than the control ($P < 0.01$). Results suggest the addition of UHV-HPMC to a carbohydrate rich meal significantly lessened postprandial glucose on healthy active individuals 120 minutes post meal. Second meal results found no significant differences. Postprandial glucose concentrations after 90 minutes and 180 minutes and the time of peak glucose concentration will be analyzed to determine if UHV-HPMC and psyllium fiber slowed the rate of absorption or reduced total absorption of the carbohydrate.
HEAVY HEART
Peterschmidt, Bernadette
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Poster Session 2: 11:15-1:45 - Poster #10

Purpose: The Purpose of my garment is to visually convey the ideas and feelings present in the songs of my favorite artist, Florence + the Machine. The juxtaposition of straight edges with draped, flowing fabrics create an emotional and symbolic example of her focus on feminine softness that has been faced with the darker elements of life. Process: During the design process I researched and took inspiration from the clothing worn by Florence + the Machine, specifically within their music videos. I also researched historical looks, such as roman draped clothing and the silhouette of the beginning of the 20th century. I chose to do paneled skirts, which would hang straight while standing still, but when moving would open to flow around the model and reveal a splash of color. Techniques: The garment was created with the draping method, which was used to create a flat pattern. The pattern was used to create a sample that was fitted to the model. Adjustments were made to the flat pattern and a final garment was created from the finalized pattern in satin polyester.

THE IMPLEMENTATION OF FREEWARE INTO AN UNDERGRADUATE BIOCHEMISTRY LAB
Petersen, Brandon; Printz, Sarah
Faculty Mentor(s): Tim Sorey, Chemistry

Poster Session 1: 8:30-11:00 - Poster #14

The focus of this experiment is to implement freeware software in lieu of traditional software and imaging hardware in an undergraduate lab setting. Currently about $3,000 is being spent on a single user license for the software Quality One that is used in biochemistry research labs and in some undergraduate learning labs. Recent development in freeware has produced a laboratory analytical method that shows potential in offering data that rivals traditional high cost techniques. If acceptable qualitative results of concentration vs. calibration curve technique can be reached by this alternative means at a free cost and provide more accessibility of software to students, then this could potentially save institutes money.

CENTRAL WASHINGTON UNIVERSITY NATIONAL TRUMPET COMPETITION TRUMPET QUINTET GROUP A, PERFORMING SUITE FOR 5 TRUMPETS
Pickard, Stephen; Fredrickson, Chris; Martinson, Sarah; Stein, Jon; Hinckley, David
Faculty Mentor(s): John Harbaugh, Music

Session: 17
Oral Presentation 10:20-10:40 in Theatre

This presentation is a recap of our trip to the National Trumpet Competition in Fairfax, Virginia on March 17th, 2011. Our group competed against such schools as University of Texas, Texas A&M, Grand Valley State University, Peabody Conservatory, and Manhattan School of Music. This is also the first year for Central to have two groups go and compete, which is an extremely high honor. We will be discussing practice sessions, preparation, and view the performance from the actual competition.
A FRESH PERSPECTIVE ON THE WRITINGS AND THEORIES OF SARAH KANE AS DEMONSTRATED THROUGH A DRAMATURGICAL STUDY OF CLEANSED

Pierson, Kate
Faculty Mentor(s): Scott Robinson, Theatre Arts

Session: 35
Oral Presentation 3:20-3:40 in Room 137A

Playwright, Sarah Kane (1971-1999) is best known for her contributions to the 1990s in-yer-face British theatre movement and the use of violence and shock within her plays; scholars often cite Blasted, her first play, to illustrate these concepts. Until now the narrow focus of scholarship on Kane prohibits an understanding of her four other plays, her stylistic and theoretical contributions to theatre, and her challenges towards the realistic form she posed to the British theatrical community. To fill this gap, the study aims to provide the first in-depth analysis on Cleansed, by looking at its thematic ideas, dramaturgical style, and the critical reception. The methodology includes play analysis of the text and original production, a look at the cultural events of the 1990s, archival research, and interviews with Kane. I will argue that Cleansed, Kane’s third play, serves as a thematic and stylistic bridge between Blasted and her later more symbolic plays, which abandon realism all together. This study presents Cleansed as a clear representation of Kane’s writing style and theoretical ideas, thus offering a new perspective on Kane’s contributions to British theatre.

ANALYSIS OF GREEN TECHNOLOGY IN UTILITY CONSTRUCTION

Plugge, P. Warren
Faculty Mentor(s): Plugge, P. Warren, Industrial & Engineering Technology

Session: 6
Oral Presentation 9:30-9:50 in Room 202

Please see the peer reviewed expanded abstract on page 152.

AN ANALYSIS OF EXPERIENTIAL LEARNING IN CONSTRUCTION MANAGEMENT

Plugge, P. Warren; Roberts, Chris
Faculty Mentor(s): Plugge, P. Warren, Industrial & Engineering Technology

Session: 28
Oral Presentation 2:10-2:30 in Room 137B

Please see the peer reviewed expanded abstract on page 153.
THE (NULL) EFFECT OF EXPERT WITNESS ON JURY OUTCOME
Polage, Danielle
Faculty Mentor(s): Danielle Polage, Psychology

Poster Session 1: 8:30-11:00 - Poster #41

The impact of eyewitness expert testimony on jurors continues to be an important topic of study. Two experiments investigated the potential interactive effects of expert testimony, eyewitness credibility, and physical evidence on guilty verdicts and other variables. In Experiment 1, participants read a case that included a credible or not-credible eyewitnesses and strong or weak physical evidence. Half of the participants read expert testimony on eyewitness factors. Results of guilty ratings showed main effects of the eyewitness and physical evidence factors in the expected direction. There was no main effect of expert and no 2-way interactions, but there was a significant 3-way interaction. This interaction showed that when expert testimony was present it enhanced the influence of the other two types of evidence, but not when testimony was absent. For the most part, however, all other analyses showed the effect of expert to be non-significant; it appears that participants were able to distinguish between credible and not-credible eyewitnesses. Experiment 2 was conducted to determine if the juror instructions given to all participants in Experiment 1 reduced the impact of expert testimony. The same design was used but for half of the participants, juror instructions were not presented. Results showed a similar pattern to Experiment 1; expert testimony did not have a significant impact on jurors and it did not matter whether there were instructions present or absent. Lack of power was not an issue as these two experiments included 800 participants. The implications of these findings will be discussed.

FABRICATION INFLATION INCREASES AS SOURCE MONITORING ABILITY DECREASES
Polage, Danielle
Faculty Mentor(s): Danielle Polage, Psychology

Poster Session 1: 8:30-11:00 - Poster #42

The current research looks at the effects of lying about a false childhood event on the liar’s memory for the false event. Participants attempted to convince researchers that false events had actually happened to them. In Experiment 1, participants showed a Fabrication Inflation Effect in that they were more likely to increase their beliefs in the lied about events than control events. Individual differences such as scores on Dissociative Experience Scale, frequency of lying, and self-reported feelings of discomfort while lying were related to rates of fabrication inflation. In Experiment 2, participants also showed fabrication inflation and were more likely to inflate their likelihood ratings when the lie was created during a separate session from the post-test. Results from both studies support the idea that Source Monitoring failures may cause participants to increase their likelihood ratings of lied about events. Implications of these results will be discussed.

FACTORS AFFECTING GDP
Powell, Holly
Faculty Mentor(s): Dominic Klyve, Mathematics

Session: 30
Oral Presentation 2:10-2:30 in Room 201

There are a lot of problems in our economy these days, and just receiving a high school diploma doesn’t get people very far anymore. More and more people are turning to colleges and universities, raising the question, does having more education improve our well being? Many people rate the well-being of individuals based on a country’s per capita GDP and unemployment rate. Testing if education has an effect on the GDP and unemployment, along with other factors, may be beneficial to finding a way to better ourselves. To answer this question, different statistical tests including multiple regression and ANOVA were run to compare mean values and test the significance of different factors towards GDP. Using data from WorldBank, the data necessary to improve the quality of life is available to run the tests listed above. After running these, it will be possible to determine what factors of our economy contribute to our quality of life and in doing so can figure out a way to make it better for our country.
GENDER DIFFERENCES: LEARNING STRATEGIES AND PERCEIVED SOCIAL SUPPORT
Ramirez, Daniel
Faculty Mentor(s): Heath Marrs, Psychology

Poster Session 1: 8:30-11:00 - Poster #39

In recent years, the issue of gender differences in college academic achievement has received increased research attention (Marrs & Sigler, in press). There is evidence that female college students use more effective study strategies and have higher college graduation rates than do males. In this study, we explored gender differences in learning strategies and social support at the college level. Data was collected via web survey from students at Central Washington University (N= 254; 81 males, 173 women). This study focuses on two instruments: the Multidimensional Scale of Perceived Social Support (Zimet, 1988) and the Motivated Strategies for Learning Questionnaire (Pintrich et. al 1991). Significant differences were found between males and females in regards to time study environment. Another significant finding between genders was support recieved from a significant other as measured by the MSPSS. Also, for females social support was significantly correlated with all five MSLQ sub-scales. For males, only help seeking was correlated with social support. This is consistent with previous research trends showing that females receive more support from significant others than do males.

CROSS CULTURAL ANALYSIS OF TIPI STRUCTURES AMONG THE BLACKFOOT, CHEYENNE, CROW AND LAKOTA.
Ratliff, Joel
Faculty Mentor(s): Kathleen Barlow, Anthropology & Museum Studies

Poster Session 3: 2:00-4:30 - Poster #2

This poster presents the results of a research project that was conducted last summer under the McNair Scholars Program. This poster looks at how tipis are seen and used today around the world and compares them to how tipis were seen and used a century ago. The process of making tipis a global commodity, as well as much of native american material culture, stems from the publication of the book, The Indian Tipi, by Reginald and Gladys Laubin. The poster then takes a closer look at what tipis actually looked like and how they were used in four Native American cultures in an historical period. We combine historical photographs and ethnographic data to give us the best possible picture to look at tipis in these four cultures. This poster presents a snapshot of tipis in these cultures. We can see foremost, similarities among these structures but then we can also see fundamental differences in design, construction, and use among different Native American cultures. In the course of my research, I have found that tipis are sometimes more widely varied than previously thought in the Plains and Plateau geographical regions.

ENHANCING WATERSHED AWARENESS: DEVELOPMENT OF AN EDUCATIONAL POSTER TO PROMOTE UNDERSTANDING OF THE IMPORTANCE OF OUR STATE’S WATER RESOURCES
Reese, Angela; Arthur, J.; Bishop, T.; McDermott, W.; Schafer, J.
Faculty Mentor(s): Michael Pease, Resource Management

Poster Session 2: 11:15-1:45 - Poster #29

A problem based learning module was created for Geography 473: Watershed Planning in Analysis to develop an easily distributable, educational outreach tool to raise awareness about Washington State’s water resources. A portion of the assignment was to work as a class to determine the appropriate focus, scope, and target audience for the end product. The result was consensus to orient this project to junior-high students, and to focus on water use and supply. A “skeleton” design was then created for the poster. The class then broke into project teams to collect appropriate data to complete the assignment. Standardizing the collected data into similar temporal, spatial scales proved problematic, and served as a learning experience that many of the researchers did not envision heading into the assignment. The end product should provide educators with a useful tool for putting the importance of our water resources into context, as well as providing suggestions for water conservation.
LEAPING TO CONCLUSIONS AT DAVIS HIGH SCHOOL
Reitz, Melissa; Sears, Jose; Albarran, Edith; Salazar, Frankie; Bautista, Maria; Ramos, Ana; Anderson, Tenisha; Martinez, Madai; Martinez, Carolina
Faculty Mentor(s): Daniel Beck, Biological Sciences

Poster Session 2: 11:15-1:45 - Poster #41A-C

Biology students participating in the CWU Watershed Activates to Enhance Research in Schools program (WATERS) at Davis High School joined a research team to extend their knowledge beyond the classroom. WATERS is a National Science Foundation funded program that brings graduate students into local classrooms to teach K-12 students about the Yakima River Watershed and to increase their appreciation and knowledge of the natural world around them. Students at Davis High School improved their critical thinking skills by implementing the scientific method as they designed research projects relating to their own interests. Three groups of students chose to team up to investigate the physiology and morphology responsible for jumping distance in Northern Pacific Tree Frog (*Pseudacris regilla*), Northern Leopard Frogs (*Rana pipiens*), and American Bullfrogs (*Rana catesbeiana*). They identified gender, body length (snout to vent length), femur length, body mass, and ambient temperature as predictors of hopping distance in these three species. Positive correlations were observed between leaping ability and frog morphology.

CONSUMERS BEWARE: A DAVIS HIGH SCHOOL CONSUMER REPORT
Reitz, Melissa; Medina, Maribel; Rodriguez, Cristian; Hernandez, Kassie; Juarez, Samantha; Villa, Nataly
Faculty Mentor(s): Daniel Beck, Biological Sciences

Poster Session 2: 11:15-1:45 - Poster #42A-B

Biology students participating in the CWU Watershed Activates to Enhance Research in Schools program (WATERS) at Davis High School joined a research team to extend their knowledge beyond the classroom. WATERS is a National Science Foundation funded program that brings graduate students into local classrooms to teach K-12 students about the Yakima River Watershed and to increase their appreciation and knowledge of the natural world around them. Students at Davis High School improved their critical thinking skills by implementing the scientific method as they designed research projects relating to their own interests. One group analyzed water quality of bottled, city, and well drinking water. This group tested five brands of bottled water, drinking water at Davis High School, and drinking water from Ellensburg for trace metals and chemicals. Another group of students compared mold growth between store bought bread and home-made bread in varying environments. These types of scientific tests give consumers insight to some common household products. Students were encouraged to perform research in line with their interests and share knowledge gained through this style of inquiry based learning.
VISITOR OPINION IN ARTIFICIAL VS. NATURAL ENRICHMENT CONDITIONS

Reveles, Julie; Jensvold, Mary Lee
Faculty Mentor(s): Mary Lee Jensvold, Primate Behavior

Session: 23
Oral Presentation 11:40-12:00 in Room 202

Enrichment is important for the psychological well-being of captive primates because it provides relief from the monotony of captive life and may provide the opportunity for species specific behaviors. The current study examined visitor responses to two conditions of enrichment at the Chimpanzee and Human Communication Institute (CHCI). CHCI is a sanctuary for three chimpanzees who use the signs of American Sign Language. The author hypothesized that there would be a difference in participant responses with 3 opinion questions asked with a post-Chimposium questionnaire. Chimposiums are public one-hour educational workshops. During Chimposiums the chimpanzees received either artificial or natural enrichment. Artificial enrichment included objects such as toys, clothes, and magazines and natural enrichment included leaves, sticks, pinecones, etc. Data collection was conducted weekends July through August 2010. All participants were over the age of 18. There were 6 questions on the questionnaire regarding the enrichment. For the question, “Do you think the enrichment is good for the chimpanzees?” there was a significant difference in opinion between the artificial and natural condition. There was no difference in opinion responses for guests who had previously attended a Chimposium and those who had not in either the naturalistic or artificial condition. Guests who witnessed the chimpanzees using enrichment in both conditions more strongly agreed that the chimpanzees liked the enrichment. This may suggest that visitor opinion has less to do with enrichment type and more with the enrichment usage.

A LOW-COST ANALOG TO DIGITAL CIRCUITRY FOR GENERAL CHEMISTRY EXPERIMENTS

Richardson, Matthew
Faculty Mentor(s): Timothy Sorey, Chemistry

Poster Session 1: 8:30-11:00 - Poster #15

We describe and demonstrate a method for digitizing quantifiable analog data for use in high school and college general chemistry classroom using widely available and inexpensive programmable microcontrollers. Currently available hardware and software solutions for data acquisition are expensive and are limited to the capabilities of the software. This system will be available for the Chemistry 451 class that is focused on understanding electronic instrumentation in high school classrooms. Analog to digital conversion (ADC) converted was programmed with the Wiring API and is run on an AMTEL AVR. The corresponding computer software was programmed in Visual Basic to allow ease of modification. New sensors can easily be brought into the system and can be calibrated to provide new interfaces for quantifying the physical world. We found it is possible to digitize signals and output them to a variety of interfaces using these microcontroller interfaces for much less money than the commercial options.
STYLE SWITCH
Roberts, Mackenzie
Faculty Mentor(s): Robert Lupton, Information Technology & Administrative Management

Session: 15
Oral Presentation 10:50-11:15 in Room 301

In many areas of the world, a negative stigma is associated with used clothing. Consumers believe products from consignment shops are dirty or unfashionable. The truth is consignment shops are exceptionally socially responsible and offer on-trend clothing for a less expensive price than new clothing. My store, Switch, will be a consignment boutique specializing in name-brand or designer young women’s clothing. Only gently used, recent trends that are examined by employees will be accepted in trade for cash or store credit. This rule will assure the clothes are clean and in style. It is my vision to change shoppers’ perspective on buying used clothing. Consigning clothing is equivalent to recycling plastic or glass. There is no manufacturing involved, so there are no negative environmental or social effects of production. Since consignment shops are already in the growth stage in the retail life cycle, it is important to offer something innovative to stand out. Switch will include a cohesive attached café inside the main store. For each dollar worth of clothing a customer sells, they will receive ten points on a special card. They can then use these points to spend like cash at the café (each point is worth a penny). This is an incentive for customers to sell more clothing, as everyone likes getting something for free. The mission of Switch is to help customers understand and accept the ethical benefits of buying used. My self-sustaining boutique will offer fashionable socially and environmentally friendly clothing at a less expensive price.

WRITER’S BLOCK - CREATING AN ONLINE LITERARY JOURNAL
Roddy, Rachel
Faculty Mentor(s): George Drake, English; Lisa Norris, English

Session: 2
Oral Presentation 9:30-9:50 in Room 137A

Back in Spring 2010, a professor of mine inspired me to create an online literary magazine for Central’s English Department to showcase the capabilities of the students. Central already has a campus-wide print publication called Manastash, but there was nothing specifically for the English Department. So, I proposed the idea and was awarded a grant for the creation of this online literary magazine, which I’ve entitled Writer’s Block. A year later, Writer’s Block has developed into a functioning website and magazine that has the contributions of students in the English Department. This experience has been very exciting for me, because it’s allowed me to live out one of my childhood dreams and learn what it’s like to develop and manage a website and work as a publisher. Being that online journals are quickly becoming a popular media for publication, I’m greatly looking forward to seeing how this magazine continues to thrive and grow in the days to come.
THE EFFECTS OF QUANTUM DOTS AND THEIR CHEMICAL COMPONENTS ON MITOCHONDRIAL FUNCTION
Rosario, Sara; Thomas, Carin
Faculty Mentor(s): Carin Thomas, Chemistry

Poster Session 1: 8:30-11:00 - Poster #19

Quantum dots (QDs) are versatile particles that find use in industrial, medical and retail applications including solar cells, cancer and tissue diagnostic imaging and light emitting diodes (LEDs). Due to the variety of QD applications, the potential for human exposure is significant and the outcome of that exposure should be known. Our research goal is to investigate mitochondria as a potential target of QD toxicity using a murine hepatocyte (mouse liver cell) model. One possible cause of QD toxicity is the release of cadmium ions from the core of the QDs. The main objective is to determine if Cadmium Selenium-Triocyl phosphine oxide- Poly(maleic anhydride-alt-1Tetradecene) or CdSe-TOPO-PMAT QD exposure disrupts mitochondrial function. Mitochondrial function will be assessed by measuring mitochondrial membrane potential, cellular respiration, ATP production and reactive oxygen species (ROS) generation in the murine hepatocytes (Hepa-1c1c7) after 0, 6, 12 and 24 hours of exposure. Experiments in which Hepa-1c1c7 cells were treated with 0.25, 2.0 and 4.0 µM cadmium nitrate were carried out to assess the ability of cadmium ions released from QDs to induce mitochondrial dysfunction. These experiments showed 0.25 and 4.0 µM cadmium increased the average cellular respiration rates to 1.42 and 0.76 µmols O₂ minute/mg protein, respectively, at all time points, while 2.0 µM cadmium and controls had average cellular respiration rates of 0.38 µmols O₂ minute/mg protein at all time points. The cellular respiration experiments indicate that cadmium released from the CdSe-TOPO-PMAT QD will have mixed results on mitochondrial dysfunction, depending on the concentration of cadmium released.

NITRATE PHOSPHATE & AMMONIA LEVELS IN THE NACHES, TIETON AND YAKIMA RIVERS
Rosario, Sara; Storlie, Clarice; Davis, Hohman, Ben; Bolong, Josh; Peral, Aided; Davis, Jonathan; Borges, Yuri; Renteria, Mirka; Vizcaino, Cecilia; Morris, Arianna; Whitmer, Grace; Ball, Bryan
Faculty Mentor(s): Dion Rivera, Chemistry

Poster Session 2: 11:15-1:45 - Poster #40

Nitrates (NO₃⁻) phosphates (PO₄³⁻) and ammonia (NH₄⁺) are important chemicals in aquatic environments, but when present in disproportionate concentrations they can result in water quality problems. Nitrates and ammonia in combination with excess phosphates can hasten a process called eutrophication; resulting in an increase in aquatic plant growth and algae blooms, lowered dissolved oxygen concentrations, and the death of fish, invertebrates, and other aquatic flora and fauna. The goal of this research was to investigate nitrate, phosphate and ammonia concentrations in three rivers; Naches, Tieton and lower Yakima. The main objective is to determine if the concentrations of these three chemicals have changed in the Naches, Tieton and in the lower portion of the Yakima River since 2000. Nitrate concentrations in water samples taken from the Naches, Tieton and Yakima Rivers in mid August were determined using a cadmium reduction colorimetric method. The concentration of nitrates in the Naches, Tieton and lower Yakima were determined to be 2.4, 2.01 and 1.62 mg/L respectively. Phosphate concentrations were determined using vanadomolybdophosphoric acid colorimetric method. In the Naches River phosphate concentrations were determined to be 2.4 mg/L, while the Tieton River had 2.36 mg/L phosphate and lower Yakima had 4.51 mg/L phosphate. Ammonia concentrations were determined using a sulfuric acid titrimetric method, and it was determined that the Naches contained 127.2 mg/L ammonia, Tieton had 7.2 mg/L ammonia and lower Yakima contained 11.2 mg/L ammonia.

A RESEARCH BASED STUDY ON CONSTRUCTIVISM AND CLASSROOM MANAGEMENT
Ross, Molly
Faculty Mentor(s): Molly Ross, Education

Session: 28
Oral Presentation 1:30-1:50 in Room 137B

Please see the peer reviewed expanded abstract on page 154.
FARRAHAN V. GREGOIRE: RACISM WITHOUT RACISTS
Ruiz, Vincent
Faculty Mentor(s): Charles Reason, Law & Justice

Poster Session 3: 2:00-4:30 - Poster #29

This case involved a challenge to the Washington State felon disenfranchisement law pursuant to section 2 of the Voting Right Act. A summary judgment against the plaintiffs was upheld by the 9th Circuit Court of Appeal which held that “intentional” discrimination must be shown in either the passing of the act or in the operation of the criminal justice system. The uncontested finding that ‘there is discrimination in Washington’s criminal justice system on account of race” is not alone sufficient. This finding is presented within theory that there can be racism without racists through laws, policies, and practices which have disparate racial impact.

THE SIGHT OF SOUND
Sawyer, Holly
Faculty Mentor(s): Hal Ott, Music

Session: 17
Oral Presentation 11:00-11:20 in Theatre

Throughout time, all of the arts have been closely tied together; music and art are no exception. My vision was to create a recital which reflected this. I prepared three selected solo pieces with an accompanist, and collaborated with a local artist to present a recital in which the musical representation of my solo pieces were shown in the movement of the artist and the subject matter of the painting as it was created alongside my live performance. I got to work closely with the visual artist, which meant learning how to communicate with her in a way that would ensure understanding. Even though many of the arts are similar, they each have their own language and ideals, and the communication of concepts presents a difficult, yet rewarding challenge.

TOTAL SYNTHESIS OF NOVEL BORONATED AMINO ACID ANALOGUES AS POTENTIAL INHIBITORS OF HIV-1 PROTEASE
Schreiber, John
Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

Session: 20
Oral Presentation 12:20-12:40 in Room 137B

Development and implementation of anti-viral drugs has dramatically improved the quality of life and survivability of the nearly 40 million people affected by HIV and AIDS worldwide. Unfortunately, current anti-viral drugs lack bioavailability, are susceptible to viral resistance, and exhibit toxicity to those on treatment regimens. For these reasons and others, new drugs must be developed in order to mitigate the side effects negatively associated with current drug treatments. Boron modified peptides provide a viable synthetic option when designing and producing novel anti-viral drugs, as they have been shown to inhibit aspartic protease enzymes, including that which is responsible for the replication of HIV. Borinic acids inhibit enzymes both competitively and associatively, with high affinities towards both the wild-type and mutant strains of HIV. In order to effectively combat HIV, it is of utmost importance to synthesize, characterize, and investigate the viability of boronated amino acid analogues as inhibitors of the HIV-1 protease.
AIR CELL INJECTIONS IN CHICK EMBRYOS INCREASE SURVIVAL FOR NEURAL DEVELOPMENT STUDIES

Schultz, Kaytlyn; Jull, Ronae; Davis, Jessie; Selski, Daniel
Faculty Mentor(s): Daniel Selski, Biological Sciences

Poster Session 3: 2:00-4:30 - Poster #8

Current research in Dr. Selski’s lab is to explore axon growth and target interactions in developing chick embryos. The main method in which to perform this research has been to culture the developing embryos outside the shell in order to treat the embryos with protein inhibitors, which are applied to the surface of the blood vessels. With this method, we have successfully been able to test our hypothesis that the protein Calcineurin is important in axon growth from the retina to the optic tectum in the brain. Although this has been successfully done, many trials are required to generate quantitative data: The embryos are subject to stresses outside the shell, which hinders their survival to the age when they are analyzed. Our hypothesis is that embryos could remain in their shells and still be treated through the air cell membrane that is directly over the developing embryo. This hypothesis was initially tested by injecting fluorescent dyes into the air cell and analyzing early embryos for fluorescence; but results were inconclusive. However, embryo survival was greatly increased compared to culturing without the shell. The hypothesis will be further tested by injecting food coloring into the air cell of eggs and allowing them to hatch. Expected results will be hatched chicks with colored feathers showing that the food coloring was able to pass through the membrane. This result will substantiate that protein inhibitor treatments into the air cell will be able to permeate through the membrane and affect the development of the embryo.

MILITARY BANDS IN THE CIVIL WAR: FACILITATING MORALE AND UNIT SOLIDARITY IN THE POTOMAC ARMY

Schwoch, Kevin
Faculty Mentor(s): Daniel Herman, History

Session: 9
Oral Presentation 11:00-11:20 in Room 135

My research paper focuses on how military bands were beneficial within the Army of the Potomac (a Union Army) during the Civil War. Bands in the Potomac Army played music for promotion ceremonies, serenades, marches, and prisoner transport, creating a higher morale and unit solidarity in camp and on the battlefield. I also discuss drawbacks to employing bands within the military. Despite being costly and slowing down troop movements, however, military bands were essential to facilitate the morale and solidarity of troops. My paper demonstrates, further, that military bands were influential in the everyday lives of a common soldier. I argue that the dismissal of particular regimental bands adversely affected troops’ morale, as shown in several diaries of Potomac soldiers. My research adds a new dimension to Civil War historiography by examining the importance of military music for the ordinary soldier.
HEADCUT INCISION HEIGHT AS AN INDICATOR OF VEGETATION CHANGE IN TWO INCISED WET MEADOWS, OCHOCO NATIONAL FOREST, OR

Sheahan, Jamie
Faculty Mentor(s): Anthony Gabriel, Resource Management

Poster Session 2: 11:15-1:45 - Poster #32

The inter-relationships of vegetation, soils, and stream channel erosion characteristics were examined in two riparian meadows of the Ochoco National Forest where progressive stream headcut incision is a critical resource management issue and restoration priority. Scientific literature establishes that headcut incision leads to lower groundwater tables, with corresponding shifts in neighboring vegetation from communities tolerant of wetter conditions to those of drier conditions, yet further research is needed in examining the degree headcut height and soil properties control this relationship. By incorporating headcut incision height and soil properties (particle size distribution, percent organic matter, percent soil moisture, and pH) as additional drivers of soil moisture availability, and thus vegetation change, fieldwork included extensive sampling of soils, vegetation, and stream characteristics. Percent canopy cover by vegetation species was surveyed in systematically placed Daubenmire plots on cross-valley transect, in which each plot was later assigned a hydric rating score based on weighted percent cover by hydric indicator status plants (OBL, FACW, etc). Due to the greater degree of water table drawdown associated with more pronounced incision, I hypothesized that changes in vegetation communities downstream of the headcuts will be positively correlated with the height of headcuts, and less so with change in soil texture. Preliminary results will be highlighted.

FLOOD ATTENUATION BY WETLAND AREA: RESULTS OF STREAM TABLE EXPERIMENTAL MODEL

Sheahan, Jamie; Nover, Miranda; Ricard, Rylee; Swedberg, Tony; Kay, Travis
Faculty Mentor(s): Jennifer Lipton, Resource Management

Poster Session 2: 11:15-1:45 - Poster #33

Morgan Middle School sixth grade researchers involved in the Yakima WATERS program investigated how vegetation and wetlands absorb flood waters by modeling with stream table experiments. Stream channels were constructed and varied by placing increasing coverage of different areal sizes of sponges in the lower end of the stream reach. Parameters compared included the amount of water discharging the stream below the wetland area. Results showed that absorption of water by the sponges increased directly with the increase in area covered by sponges. The experiments suggest that by increasing the area of wetlands there will be an increase the absorption of flood waters potentially leading to a decrease of downstream flood damage.

STREAM EROSION RESPONSE TO RAPID LATERAL TILTING

Sheahan, Jamie; Creech, Ryan; Sully, Hunter; Garcia, Kassandra; Anderson, Molly
Faculty Mentor(s): Jennifer Lipton, Resource Management

Poster Session 2: 11:15-1:45 - Poster #34

Geologic forces of tilting, faulting and folding considerably influence stream systems worldwide through altering slopes, sedimentation rates, and channel migration. Morgan Middle School sixth grade researchers involved in the Yakima WATERS program demonstrated how rapid lateral tilting impacts such stream processes by experimenting with stream table models. Stream channels of equivalent slope were constructed under laterally tilted and zero-tilt geologic conditions. Erosion was measured as the change in width and depth of the stream channel at each of four benchmark stations, following equivalent stream flow treatments. Results showed that rapid lateral tilting increased overall stream bank and stream bed erosion with some variability between each station. The research confirms that active tilting through volcanic or tectonic processes leads to stream degradation concurring with principles of fluvial geomorphology.
EFFECTS OF ACAI BERRY EXTRACT ON UV-INDUCED C2C12 MOUSE MYOBLAST VIABILITY
Shelman, Melissa; Hunt, Heather; Copeland, Kari; Bosch, Brittany
Faculty Mentor(s): Ian Quitadamo, Biological Sciences

Poster Session 3: 2:00-4:30 - Poster #14

Research Question: Does the concentration of antioxidants in pure acai juice concentrate affect the morphology and improve the viability of UV treated C2C12 mouse myoblast cells? Introduction: Studies have shown antioxidants help reduce oxidative damage and cancer. The tropical acai fruit has become known as a super antioxidant fruit. Acai products are sold as remedies and health supplements. Our goal is to determine if the acai fruit contains high antioxidant properties and if the health supplements are beneficial. Methods: Using C2C12 mouse myoblast cells, cultured in normal conditions, each of four groups received a solution containing either no acai berry concentrate, a half dose, a full dose, or a double dose of acai berry concentrate. The cells were then subjected to twenty seconds of UV radiation, and examined to determine viability. Results: Cells exposed to the daily recommendation of acai experienced a 51% increase over the control in the survival rate after 20 seconds of UV radiation. Cells exposed to twice the daily recommendation had double the survival rate of the control. Conclusions: Our aim was to determine the effectiveness of acai antioxidants in preventing changed cell morphology and death caused by UV radiation. The results show the antioxidant capacity of acai concentrate can prevent oxidative stress from UV radiation, potentially decreasing various forms of cancer. Future experiments could test more varied acai concentrations, varied levels of UV radiation, long-term exposure to acai, and comparisons between acai and other antioxidant rich fruits.

HE ACTED SO QUEER
Shepard, Kailey
Faculty Mentor(s): Daniel Herman, History

Session: 1
Oral Presentation 8:30-8:50 in Room 135

“He Acted So Queer” is a paper which examines late nineteenth-century society after the Civil War and how the individuals of that era interpreted what is now called Post Traumatic Stress Disorder (PTSD) in veterans. Through looking at family letters and diaries, as well as the records of doctors and communities, the paper seeks to discover how people dealt with and adapted to the influx of veterans with PTSD. This paper focuses less on the veterans who experienced PTSD and more on the individuals which who observed it, tried to hide it, and changed their way of living to adapt to it. The paper suggests that late nineteenth-century Americans recognized the constellation of symptoms today identified as PTSD, but, at the same time, tried to suppress those symptoms and hide those who suffered from them.

TARGET-LIKE ACQUISITION OF PAUSING
Sherren, Sarah
Faculty Mentor(s): Xingzhong Li, English

Session: 19
Oral Presentation 12:40-1:00 in Room 137A

In this study I attempted to see if L2 American English speakers’ pausing patterns before clause-final prepositional phrases (CFPPs) would reflect those of L1 American English speakers’. The rationale for this study was that pausing is used as a part of the rhythmic information chunking by L1s, and knowing if L2 speakers can acquire this kind of prosodic information structuring from regular language classes or simple exposure to the target language can give evidence to whether teaching appropriate pausing could be a useful part of the language classroom. For this study, three L1 and three L2 English speakers, ranging from intermediate to advanced and having taken no prior phonetics or phonology classes, were asked to be recorded while reading a short descriptive narrative aloud; their results were transcribed and analyzed. It was found that the L2 results did tend to reflect L1 results in pause presence as well as pause length, even when an L2 reader had difficulty with other parts of the text. The results imply that in the case of CFPPs, the prosodic function of rhythmic pausing as an information management system when reading a text in English aloud can be naturalistically picked up by L2 English learners without specific instruction.
SYNTHESIS OF 5,6-DIHYDROPYRAN-2-ONE AS POTENTIAL INHIBITORS OF HIV-1 PROTEASE
Sigurjonsson, Kristin; Nye, Jesse; Palmer, Scott
Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

Poster Session 1: 8:30-11:00 - Poster #6

Drug discovery and development for HIV/AIDS has led to groundbreaking anti-retroviral therapies including HIV-1 protease inhibitors. However, the rise in resistance to current treatments as well as issues regarding drug toxicity and affinity, generate a need for more effective inhibitory structures. This synthetic chemistry research builds on a previous research effort, in which HIV-1 protease inhibiting structures were designed using molecular modeling methods. Quantitative Structure-Activity Relationship (QSAR) was implemented using a fuzzy neural network to predict the biological activity for these compounds. We are synthesizing the novel structures through known methodologies. The inhibitory values of the target compounds will be determined and compared to the values predicted by the neural networks. We hope that the target compounds will possess better inhibitory properties, increased bioavailability and decreased toxicity compared to currently available inhibitors.

COMPARATIVE ANALYSIS OF LENGTH POLYMORPHISMS IN THE PROMOTER REGION OF THE SEROTONIN TRANSPORTER GENE (SLC6A4) IN CERCOPITHECIDAE
Simons, Noah; Winters, Sandra; Lorenz, Joseph
Faculty Mentor(s): Joseph Lorenz, Primate Behavior

Session: 23
Oral Presentation 12:00-12:20 in Room 202

The serotonin transporter gene (SLC6A4) is a critical component in the serotonergic system. Sequence variation in SLC6A4, particularly VNTR length polymorphisms in the promoter region (referred to as 5-HTTLPR) have been associated with a number of neuropsychiatric-related phenotypes in humans and behavioral phenotypes associated with stress and aggression in rhesus macaques. Here we present a comparative analysis of length polymorphisms in the promoter region of SLC6A4 in 26 species across 13 genera of nonhuman primates within the family Cercopithecidae (n=306). Our results indicate length polymorphisms in 30.1% (n = 8) of species, which is more variation than previously thought. In polymorphic species the two common alleles are long (L) and short (S), with average genotype frequencies of 73.5% (L/L), 11.8% (S/S) and 14.7% (L/S). While allele frequencies do vary across polymorphic species, the frequency of the homozygous (S/S) genotype ranges from 4.34% in the Indian rhesus macaque (Macaca mulatta) to 83.33% in the Olive baboon (Papio Anubis). The homozygous (S/S) and heterozygous (L/S) genotypes are of interest because they are associated with reduced transcription efficiency. Individuals with (L/S) and (S/S) genotypes have significantly lower maximal uptake of serotonin than (L/L) genotypes. These results therefore have implications for our understanding of inter-species behavioral variation.
METHODS AND IMPLICATIONS OF THE NONINVASIVE COLLECTION OF SALIVA FROM NONHUMAN PRIMATES

Simons, Noah; Lorenz, Joseph; Sheeran, Lori; Matheson, Megan; Li, Jinhua
Faculty Mentor(s): Joseph Lorenz, Primate Behavior

Poster Session 3: 2:00-4:30 - Poster #39

Cryptic and endangered fauna, including many primate taxa, pose challenges when it comes to the noninvasive collection of their biomaterials. For this reason the application of noninvasive genotyping to primates has been limited to the use of low quality samples (i.e. degraded DNA). We present a successful method for the noninvasive collection of saliva from habituated, free-ranging monkeys. An apparatus was designed with the goal of collecting saliva from individual, identifiable monkeys. The method and apparatus were used in the collection and successful extraction and amplification of the Cytochrome B and MHC-DR Beta 1 genes (used in phylogenetic and kinship studies) in 18 individuals from a population of Tibetan macaques (Macaca thibetana) in the Valley of Wild Monkeys in Huangshan, People’s Republic of China. This sample size (n=18) represents 60% of the Yulingkeng 1 (YA1; n=30) population, and includes juvenile, sub-adult and adult individuals of both sexes. These results indicate this is an effective technique for the noninvasive collection of saliva across age/sex class in a free-ranging, terrestrial primate species. The collection of high-quality saliva samples from individuals in free-ranging primate populations could have a wide-range of implications for epidemiological studies, hormonal analyses of HPA Axis functioning, pathogen screening, non-invasive genotyping, and behavioral genetics.

GEORGE E. STEPHENS AND JAMES H. GOODING: CIVIL WAR CORRESPONDENTS FROM THE 54TH MASSACHUSETTS

Smith, Nadine
Faculty Mentor(s): Daniel Herman, History

Session: 1
Oral Presentation 8:50-9:10 in Room 135

When George E. Stephens enlisted in the 54th Massachusetts, he began writing by-weekly letters to the editor of The Weekly Anglo-African. James H. Gooding enlisted in the 54th in February of 1863. Gooding also wrote weekly and bi-weekly letters to the New Bedford Mercury. Gooding and Stephens were both black men using their educations to benefit all African American people. Their prolific letters help to explain why black men, who were shown little regard by whites, would volunteer to defend the Union. James E. Stephens and George Henry Gooding’s most important objectives in the Civil War were to end slavery, free fellow members of the black race, prove that black men were capable of patriotism, and earn the right to be considered men, who were deserving of the same civil liberties and rights as white men.

UNINTENDED OUTCOMES: SOCIODEMOGRAPHIC DIVERSITY, WITHIN-SCHOOL STRATIFICATION, AND ACCESS TO MIDDLE LEVEL ARTS CURRICULA

Smith, Bret; Hoffman, Adria
Faculty Mentor(s): Bret Smith, Music

Session: 36
Oral Presentation 2:40-3:00 in Room 137B

Please see the peer reviewed expanded abstract on page 155.
THE ECO-FRIENDLY CONSUMER: WILLING TO SPEND MORE ON APPAREL?

Smith, Kara; Larson, Devin; McHenry, Courtney; Barber, Jamie
Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management

Session: 37
Oral Presentation 3:00-3:20 in Room 140

The purpose of this study is to discover the level of awareness the Central Washington University community has towards eco-friendly apparel. Additionally we are seeking to find whether or not they are willing to spend more money if it is in support of the environment. We hypothesize that the amount of awareness will coincide with the level of an individual’s education. Also we believe that those in support of eco-friendly apparel are in fact willing to spend more money. We predict our conclusion will show that eco-friendly apparel would have a greater consumers support if its prices were less competitive with brand name apparel.

THEY CALL IT DEMOCRACY: REPUBLICAN GOVERNMENT IN EUROPE

Smith, Dustin
Faculty Mentor(s): Rex Wirth, Political Science

Poster Session 1: 8:30-11:00 - Poster #27

A poster presentation using the conceptual frame work for Civil Society, Elite Recruitment, Political Socialization, and Interest Groups from the student generated text: They Call It Democracy: Republican Government in Europe. The poster illustrates the use of topical grids to make a comparative analysis of four major democratic powers. A comparison of the social institutions in the postmodern era of democracy in the United States, Great Britain, France, and Germany shows that with the advancement of civil society and the conceptual areas of elite recruitment, political socialization, and interest groups will illustrate different styles of democracy tailored to each state. Focusing in on each style, in comparison to each conceptual topic, will show how each state’s social institutions function in various aspects according to the definition of each democratic style. These democratic styles include pluralism, elitism, statism, and corporatism that are represented by each quadrant on the topical grids.

GREEN FLOURESCENT PROTEIN TAGGING OF THE TRYPANOSOMA CRUZI FLAGELLUM

Smith, Sarah
Faculty Mentor(s): Gabrielle Stryker, Biological Sciences

Poster Session 3: 2:00-4:30 - Poster #13

American trypanosomiasis, also known as Chagas disease, causes significant morbidity and mortality throughout most of Central and South America. There has been no successful medical cure or vaccination developed thus far. The cause of this disease is a single-celled flagellated parasite named Trypanosoma cruzi. The organism's flagellum is one of the most complex structures found in cells and contains more than 250 proteins. Within the flagellum is a structure known as the Paraflagellar Rod (PFR) which has been shown to protect mice in immunization trials. The goal of this project is to create a recombinant DNA construct that, when inserted into the parasite, will allow us to visualize the location of a paraflagellar rod protein (PFR2) within the cell. Green fluorescent protein (GFP) is a protein isolated from the jellyfish, Aequorea sp., which fluoresces green when exposed to blue light. Thus far, PFR2 and GFP constructs have been inserted into vectors and transformed into Escherichia coli and confirmed by DNA sequencing. The constructs are being fused together to form the recombinant proteins GFP-PFR2 and PFR2-GFP. These recombinant proteins will be expressed in the parasite to visualize the sub-cellular localization of PFR2 proteins within the flagellum. This research will serve as proof of principle that GFP can be used as a tag in vivo for known flagellar proteins.
DOES CONVENIENCE AFFECT HEALTHY EATING CHOICES AND FOOD PURCHASE DECISIONS?
Smith, David
Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management

Poster Session 3: 2:00-4:30 - Poster #26

The purpose of the research is to investigate whether convenience affects the food purchase decisions and healthy eating options made by CWU students. I wish to investigate which factors come to play when students choose what and where they eat. It is my belief that my research will indicate that those students with meal plans choose to eat in the Student Union and Recreation Center (SURC) not because of convenience but because of necessity, they would choose to eat at an alternative location. I believe we will see a correlation between new international students (two quarters or less) and choosing to eat in the SURC because of a lack of other options due to insufficient local knowledge of food retailers. I believe that we will see that new students are unaware of the food outlets downtown because they have not had the opportunity to discover them. The participants will be between 50 and 150 CWU students of all ages, and I will recruit said participants through the distribution of leaflets. I will also target international students for my research. Participants will complete a ten-question questionnaire with questions focused on their eating location choices and food purchasing decisions. Infallible anonymity will be maintained because no personally-identifiable information will be collected.

SUPPLY CHAIN DEVELOPMENT (COLUMBIA VALLEY BREWING CO.)
Smith, Charles
Faculty Mentor(s): Kun Liao, Finance & OSC

Lynnwood Center Poster Session - Poster #8

Columbia Valley Brewing, like all new start-up companies, requires a product to sell. The process in which components, or ingredients to the end product, are selected are universal. In developing the supply chain for Columbia Valley Brewing these processes will be used to show how these methods may be applied to other start-ups. Methods for this process include need identification, supplier evaluation, quantity and inventory. Components and ingredients will be identified. Evaluation of potential suppliers will be conducted using pre-determined criteria and inventory levels set for product flow. Finally price levels set from cost, and market norms. In this process, a common thread to all business start-ups is shown. A company’s ability to find the right components, ingredients that satisfy the product requirements and at the right price is crucial for maintaining the bottom line.

JAMES BOND: THE MAN LOVED BY ALL
Sommerville, Sean
Faculty Mentor(s): Melissa Johnson, English

Session: 27
Oral Presentation 1:30-1:50 in Room 137A

This examination of the James Bond film series evaluates the traits that define a character who has swept the globe, idolized by viewers and subsequent filmmakers for nearly 50 years. Bond’s cultural phenomenon on film began with Dr. No in 1962 and has evolved as an icon for every decade since. Since the beginning, Bond has won over audiences with sizzling romantic relationships, pristine style, and an unbreakable loyalty to MI6. While there are some core characteristics that have stayed true to the Bond series, others have been transformed over time. His changing character can be seen in his physical appearance, his relationships with the many Bond girls, and the technological advances in his gadgets and weapons. Bond’s physical appearance varied from dark hair to blonde, athletic to muscular and romantic to edgy. His relationships with the always-present Bond girls also transformed to reflect deeper emotions. Finally, the Bond series was successful in utilizing innovative weaponry, such as his watch which includes a bomb detonator, laser and other life saving devices.
A LESSON PLAN FOR CHILDREN’S HOSPITAL
Spalti, Erica
Faculty Mentor(s): Rick Hutchins, English

Poster Session 3: 2:00-4:30 - Poster #24

This is a lesson plan to fight illiteracy as well as give hope to those at Children’s Hospital. The idea for this came my senior year in high school when I did my senior project. I had done something similar to this before, but I have expanded my theory, idea, and plan since SOURCE last year. Many times in classrooms, students are pulled out of classes in order to improve reading and writing styles. This causes a few problems; one, the student in question does not focus on his/her work because they would rather be in class with their friends. Two, they miss out on normal class work that the class is doing as a whole. Three, they are labeled as “special”, “retarded”, “stupid”, etc., because they need extra help. This also happens to children who are suffering from illness and battling for their lives, children who have been taken out of school in order to fight disease. Now, all the children at Children’s Hospital may not have literacy problems, but they may have given up hope. With the lesson plan I have created, this is a fun engaging project that will not only better their reading and writing skills, but it will also give children something to do to get their mind off of the pain they’re in.

WHAT’S CENTRAL FOR A BATTLE BOT?
SPiry, Jonathan
Faculty Mentor(s): Bill Cattin, Industrial & Engineering Technology

Session: 6
Oral Presentation 8:50-9:10 in Room 202

For the Battle Bots IQ conference this past February in Miami Florida, a team of Central students came together and donated their time to design, build, and compete a battle bot. This experience was important because it brought electrical engineers and mechanical engineers together. I applied what I had learned from IET 311 Statics, IET 312 Strengths of Materials, MET 255 Machining, MET 426 Applications in Strengths of Materials and MET 418 Mechanical Design I with MET 419 Mechanical Design II. Through competing, we learned that titanium and steel were favored over aluminum, our primary material. We also learned that the controller we selected, the VEX, was not meant to withstand impact. The conclusion was to not use a VEX controller and to use a material more resilient than aluminum. Already students are taking over the battle bots club for next year and are pursuing how to improve upon this year’s design.

WHO’S RATING THE RATERS? AN EXAMINATION OF CONTENT ANALYSIS.
Stefani, Whitney
Faculty Mentor(s): Kara Gabriel, Psychology

Poster Session 1: 8:30-11:00 - Poster #34

Content analysis is the quantification of themes or messages in text, video, or other media. Variations in content analysis methodologies and topic areas over time have received relatively little attention in the literature. This paper seeks to develop a rating system that will permit the identification and possible measurement of patterns in a) topic areas, b) media type, c) sampling methods, d) use of theoretical justifications, e) degree of interpretation versus objective criteria, f) ultimate proposed use of findings, g) coder training, h) rater reliability assessment, and i) the inclusion of detailed coding schemes. The efficacy of the rating system at identifying longitudinal changes in content analyses across a variety of psychological and communication journals will be evaluated. In part, this paper will provide information useful in identifying best practices for conducting content analyses.
PSYLLIUM HUSK FIBER FORTIFICATION IS ACCEPTABLE IN GLUTEN-FREE BANANA MUFFINS
Sterzer, Kayci; Trappmann, Jess; Kingery, Heather

Faculty Mentor(s): David Gee, Nutrition, Exercise, & Health Services
Poster Session 3: 2:00-4:30 - Poster #33

Fiber fortification of gluten-free products may help individuals with Celiac disease achieve adequate intake of dietary fiber. This study examined the sensory attributes of gluten-free banana bread muffins made using a commercial gluten-free baking mix (Perfect Flour Blend, Namaste Foods, Coeur d’Alene, ID) fortified with psyllium fiber and non-fortified muffins. Fifty-two healthy, untrained university students served as sensory judges and evaluated muffins with no added psyllium (Control, 1.7g fiber/muffin), 1 tbsp psyllium per batch of 12 muffins (1T, 2.9g fiber/muffin), and 2 tbsp psyllium per batch (2T, 4.0g fiber/muffin). Results of the triangle tests, indicated differences between the 2T muffins with both the 1T muffins (p<0.01) and Control muffins (p<0.001), but no difference between the 1T muffins and the Control muffins. In addition, judges found no differences in moistness, graininess, and overall preference between muffins. The muffin variations were all significantly different in height with the Control muffin being the tallest and the 2T muffin being the shortest (p<0.05). A universal texture analyzer (TA.XT2, Texture Technologies Corp., Scarsdale, NY/Stable Micro Systems, Godalming, Surrey, UK) was used to measure compression and withdrawal forces. Both muffins fortified with psyllium required more compression force than the Control muffin, but there was no difference in compression force between the 1T and 2T muffins (p<0.05). There were significant differences in the withdrawal force between all three types of muffins suggesting a significant increase in stickiness with increasing psyllium fiber (p<0.05). These results suggest that the addition of psyllium fiber is acceptable in gluten-free banana muffins.

VITAMIN D STATUS OF MALE COLLEGIATE ATHLETES FOLLOWING SUPPLEMENTATION WITH AN ORAL VITAMIN D SPRAY
Storlie, Dana; Pritchett, Kelly; Pritchett, Robert; Cashman, Linda
Faculty Mentor(s): Kelly Pritchett, Nutrition, Exercise, & Health Services

Session: 13
Oral Presentation 10:20-10:40 in Room 201

Vitamin D insufficiency is widespread in the general population, therefore supplementation may be necessary. The purpose of this study was to determine prevalence of vitamin D insufficiency and the efficacy of supplementation with an oral vitamin D spray over 12-weeks in male, outdoor athletes. We hypothesized participants to have lower rates of vitamin D insufficiency compared to the general population and that vitamin D supplementation would be beneficial in maintaining optimal 25(OH)D status from fall to winter. Outdoor, male athletes (n = 27) were examined in the fall and winter on 25(OH)D concentrations, dietary and lifestyle factors. Participants were randomly assigned to control (CON) or treatment (VITD) group (1000 IU vitamin/day). Initially, 25% of participants displayed vitamin D insufficiency. Following 12 weeks of supplementation, no significant differences were observed between the VITD and CON groups. Overall, 25(OH)D levels had significant seasonal decline (p < 0.001). Results suggest that supplementation with 1000 IU/day of vitamin D may not be enough to prevent seasonal decline in 25(OH)D levels. Compared to the general population, vitamin D insufficiency appears lower among male, outdoor athletes. Therefore, research continues to be warranted regarding vitamin D supplementation in athletes.

EMPLOYERS’ BENEFITS OF COOPERATIVE BUSINESS EDUCATION IN NORTH AMERICA, EUROPE, AND ASIA
Takei, Hideki; Braunstein, Lori; Wang, Fen
Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management

Session: 37
Oral Presentation 3:20-3:40 in Room 140

Please see the peer reviewed expanded abstract on page 156.
EFFECT OF INTERNAL PRESSURE ON THE VIBRATIONAL FREQUENCY RESPONSE OF A FLUID-FILLED SPHERICAL SHELL

Taylor, Robert; Abdul-Wahid, Sami
Faculty Mentor(s): Andrew Piacsek, Physics

Session: 3
Oral Presentation 9:10-9:30 in Room 137B

The resonance frequencies of a spherical aluminum shell (radius 3.0 in, thickness 1/8 inch) filled with water have been measured for several values of static water pressure, ranging from atmospheric pressure (about 15 psi) to 200 psi. The shell is suspended above a loudspeaker by elastic cords and is excited acoustically with a swept sine wave. The vibrational response is measured with two small accelerometers mounted on the shell surface, while a microphone mounted between the shell and the loudspeaker measures the excitation amplitude. Control of the sine wave output and the processing of the accelerometer and pressure signal inputs are performed on a PC using a custom designed LabVIEW interface. Results show that, within the experimental pressure range, a pressure increase of 10 psi causes resonance frequencies associated with axisymmetric bending modes to shift higher by .015% to .019%, consistent with predictions of elastic shell theory. For example, a resonance that occurs at 9900 Hz when the water inside the shell is at atmospheric pressure will occur at approximately 9902 Hz when the water is at 10 psi above atmospheric pressure. The effect as reported here may have an application in the development of a noninvasive method for measuring intracranial pressure changes. This work was supported by CWU STEP program and the National Science Foundation.

THE TOXICITY OF INDUSTRIAL SURFACE COATING IN AUTO BODY SHOPS AND SHIP YARDS, AND THE EFFECTIVE METHODS TO SUCCESSFULLY MANAGE A HEALTHY AND ENVIRONMENTALLY SAFE PRACTICE

Tazi, Alexander
Faculty Mentor(s): John O'Neill, Industrial & Engineering Technology

Poster Session 3: 2:00-4:30 - Poster #22

My research investigates the toxicity of industrial surface coating in seven body shops and four ship yards companies and the effective methods to successfully manage a healthy and environmentally safe practice. My study describes studies done by researchers, particularly the dermal exposure to isocyanate because of its significant exposure in auto body shops, and can markedly contribute to occupational asthma and sensitization. Fluorothane MS is widely used in bottom boat coating applications and exposure to fluorothane may irritate skin or mucous membranes, and gross overexposure may cause suffocation, if air is displaced by vapor, repeated or excessive overexposure may cause central nervous system stimulation, headache, sleeplessness, tremors, convulsion and unconsciousness. This work focuses on the effectiveness of downdraft booths, and nitrile gloves for spray painter. I visited, interviewed, and collected categorical data and made a qualitative data analysis. My empirical method was based upon observational study with some limitations because the interview process was based on voluntary basis. My preliminary data analysis suggest that body shops and ship yards equipped with downdraft booths, and use required personal protective equipment (PPE) are in compliance with the OSHA, and EPA guidelines and regulations ,as well as protecting their employees from the harmful exposure of paint toxicity . Finally, I concluded in my recommendations the effectiveness of engineering controls, administrative controls, and personal protective equipments as a method to mitigate and eliminate the health hazards associated with paint exposure in body shops and ship yards industries.
EFFECTS OF C₆₀ ON ELECTRON FLOW THROUGH MITOCHONDRIAL COMPLEXES III AND IV

Teng, Hsiang

Faculty Mentor(s): Carin Thomas, Chemistry

Poster Session 1: 8:30-11:00 - Poster #16

Buckminster Fullerenes (C₆₀) have been shown to cross lipid bilayers in vivo (Qiao, 2007). In this study, we focused on the effect of the Fullerenes on bovine heart mitochondrial inner membrane electron transport chain (ETC) system, specifically between mitochondrial Complexes III and IV. To address the effect of C₆₀ on electron flow, we examined the effect of C₆₀ solubilized in 7.5% bovine serum albumin (BSA) on isolated bovine heart mitochondrial function by monitoring oxygen consumption under conditions that measure electron transport between only Complexes III and IV. We measured oxygen consumption in mitochondria after exposure to C₆₀ for time intervals of 10, 20 and 30 min. The artificial electron donors ascorbate and N,N,N’,N’-tetramethyl -P-phenylenediamine were used to apply electrons to Complex III. Antimycin A was used to prevent reverse electron flow back through complex II and I by binding between cyt b and cyt c1 in complex III. In the results, we did not observe a dose-dependent increase in inhibition of electron transport from 20 to 35 ppm C₆₀ in 7.5% BSA. At 2 ppm C₆₀ in 7.5% BSA, increased oxygen consumption rates were observed at all time intervals. No inhibition was observed at 10 ppm C₆₀ in 7.5% BSA. The results of this study will help us to understand how C₆₀ interacts with biological membranes to inhibit the function of the ETC in mitochondria, and may have implications for effects on other membrane functions.

STUDIES TOWARD THE TOTAL SYNTHESIS OF 5-BROMO-8-METHOXY-1-METHYL-BETA-CARBOLINE

Tenney, Ashley

Faculty Mentor(s): Stephen Chamberland, Chemistry

Poster Session 1: 8:30-11:00 - Poster #2

The objective of this project is to complete the first total synthesis of 5-bromo-8-methoxy-1-methyl-beta-carboline from commercially available chemicals. This molecule has been isolated from the marine bryozoan Pterocella vesiculosa found near the north island of New Zealand and near the southeastern Australian coast. Since this molecule has only been found in a small area of the planet, a procedure to synthesize it in the lab is important. Furthermore, because this molecule exhibits moderate activity against P388 mouse leukemia cells, its synthesis could potentially lead to a new treatment for human leukemia. We have thus far assembled 4-bromo-7-methoxyindole and are three chemical steps away from completing the synthesis of the target molecule.

THOMAS HOBBES AND FRIEDRICH NIETZSCHE: AN EXAMINATION OF SELF-INTEREST AND THE WILL TO POWER

Thomas, Nathan

Faculty Mentor(s): Ruthi Erdman, Douglas Honors College; Matthew Altman, Douglas Honors College

Session: 41
Oral Presentation 2:40-3:00 in Room 301

In his Leviathan, Thomas Hobbes concludes that humankind is driven by self-interest. With the book Beyond Good and Evil, Friedrich Nietzsche assumes a similar stance in terms of human nature: humans are driven by a will to power rather than merely a will to survive, or to self-preservation. This presentation compares the two authors and their assumptions.
THE CENTER FOR GEOSPATIAL POETRY: PROGRAM FOCUS AND METHODOLOGY

Thompson, Marc
Faculty Mentor(s): Robert Hickey, Geography; Katherine Whitcomb, English

Poster Session 2: 11:15-1:45 - Poster #13

An objective of the Center for Geospatial Poetry at Central Washington University is to use new digital media to link poetry with place. The main problem is one of expressing the regionality of poems to geographic space effectively and interactively through the utilization of novel - but increasingly common - means of digital publishing. This overall objective is being met in two ways in a pilot project in Washington State. First, We are soliciting poems from a wide range of Washington poets who write about landscape and place. These poems are then combined with photographs, saved as Google Earth KML files, and published online. Anyone with an internet connection can then install Google Earth, download the KML, and browse an interactive experience which interrogates the cultural landscape in terms of meaning as well as in geographic locality. The second part of the project is to convert the Google Earth project into an e-book; one which can be read on any platform (probably as a PDF) and browsed in multiple formats (spatially, alphabetically by poet or poem title, or page by page). Because of the nature of the project, dissemination of both products could be global and unique to the poetry world.

THE EFFECTS OF OMEGA-3 FATTY ACIDS AND BEXAROTENE ON HUMAN BREAST CANCER PROGRESSION

Trappmann, Jessica; Hawk, Susan
Faculty Mentor(s): Susan Hawk, Nutrition, Exercise, & Health Services

Session: 13
Oral Presentation 10:40-11:00 in Room 201

In both animal and cell culture studies, omega-3 fatty acids share growth regulatory effects similar to those noted when breast cancer cells are treated with RXR specific retinoids. One synthetic RXR-selective retinoid ligand, bexarotene (LCD 1069, Targretin), is used clinically to treat cancer patients. Bexarotene is also shown to be an effective chemopreventive and chemotherapeutic agent in mouse mammary carcinomas. Of concern is that some patients are unable to tolerate high doses of such treatment drugs. We hypothesized that omega-3 fatty acids and bexarotene may work synergistically to slow breast cancer cell growth. To facilitate this study, we used an in vitro cell culture model. We investigated the relationship between a-Linolenic (ALA) acid, Docosahexaenoic acid (DHA) and Eicosapentaenoic acid (EPA) alone and in conjunction with bexarotene in slowing MCF-7 cell growth. Following a 72 hr incubation with the respective treatments, neither bexarotene nor ALA altered cell growth. When DHA was administered alone and in combination with bexarotene, it showed a strong growth inhibitory effect. EPA alone was not as effective in altering cell growth. Interestingly, when combined with bexarotene, EPA tended to be more effective at slowing cell growth that when cells received EPA alone. Thus, select omega-3 fatty acids alone are most effective in slowing breast cancer cell progression, and may even enhance the uptake of retinoid treatment drugs and help potentiate their efficacy.
Breast cancer cell growth can be inhibited in vivo by retinoid X receptor (RXR) specific retinoids. In both animal and cell culture studies, omega-3 fatty acids share growth regulatory effects similar to those noted when breast cancer cells are treated with RXR specific retinoids. One synthetic RXR-selective retinoid ligand, bexarotene (LCD 1069, Targretin), is used clinically to treat cancer patients. Bexarotene is also shown to be an effective chemopreventive and chemotherapeutic agent in mouse mammary carcinomas. Of concern is that some patients are unable to tolerate high doses of such treatment drugs. We hypothesized that omega-3 fatty acids and bexarotene may work synergistically to slow breast cancer cell growth. To facilitate this study, we used an in vitro cell culture model. We investigated the relationship between α-Linolenic (ALA) acid, Docosahexaenoic acid (DHA) and Eicosapentaenoic acid (EPA) alone and in conjunction with bexarotene in slowing MCF-7 cell growth. Following a 72 hr incubation with the respective treatments, neither bexarotene nor ALA slowed cell growth. When DHA was administered alone and in combination with bexarotene, it showed a strong growth inhibitory effect. EPA alone was not as effective in altering cell growth. Interestingly, when combined with bexarotene, EPA was effective at slowing cell growth. Thus, select omega-3 fatty acids alone are most effective in slowing breast cancer cell progression, and may even enhance the uptake of retinoid treatment drugs and help potentiate their efficacy.

INVESTIGATING THE EFFECTS OF THE PLASTICIZERS BISPHENOL A AND DI(2-ETHYLHEXYL) PHTHALATE ON DOPAMINERGIC NEURONS IN A C. ELEGANS PARKINSON’S DISEASE MODEL.

Valera, Amanda

Faculty Mentor(s): Carin Thomas, Chemistry; Lucinda Carnell, Biological Sciences

Session: 21
Oral Presentation 12:40-1:00 in Room 140

Parkinson’s disease (PD) is a neurodegenerative disorder characterized by loss of dopamine (DA) containing neurons in the substantia nigra of the brain. Though the pathways that lead to PD are varied and not well understood, elevated levels of reactive oxygen species (ROS) and inhibition of the mitochondrial electron transport chain enzyme complex I have been associated with PD pathogenesis. Environmental factors such as the plasticizers bisphenol A (BPA) and di(2-ethylhexyl) phthalate (DEHP) may also be involved in PD pathogenesis. In this research, two strains of the nematode Caenorhabditis elegans (C. elegans), a wild-type N2 strain and an ROS-sensitive nrt-1 mutant, were used to test the toxicity of BPA and DEHP at chronic exposure levels of 10 to 500 ppm. Worms were grown on nematode growth media containing BPA and DEHP to adulthood and tested for physiological function and scored for degeneration of DA neurons. Developmental studies showed that BPA exposure levels of 10 to 500 ppm slowed development in the nrt-1 mutant, while DEHP exposure did not. No difference was observed in the pharyngeal pumping rates, or normal neuromuscular function. DA neuron degeneration was observed at all levels of BPA and DEHP exposure. These data suggest that chronic low-level BPA and DEHP exposure may increase DA neuron degeneration as worms age. In addition, chronic exposure to 10 ppm and 500 ppm of the estrogenic (mimics estrogen) compound BPA disrupts development in C. elegans.
RADIOCARBON CHRONOLOGY FOR THE HOLE-IN-THE-WALL AND FRENCH RAPIDS ARCHAEOLOGICAL SITES, MIDDLE COLUMBIA RIVERA

Vargas, Estanislado
Faculty Mentor(s): Steven Hackenberger, Anthropology & Museum Studies

Session: 23
Oral Presentation 12:20-12:40 in Room 202

Artifact assemblages from archaeological sites 45KT12 and 45KT13 were analyzed for suitable radiocarbon samples. Contents of the original field journals from 1961 and 1962 were digitized and used to create updated soil profiles that include the occupation layers described in Robert Kidd’s 1964 report. Collections were sorted and 8 samples of bone were selected for radiocarbon dating with the intent of contributing to the chronology of house settlements along the Middle Columbia River. The radiocarbon results have interesting implications for house settlement and related climate changes in the Middle Columbia River between 3000 and 1500 years ago. Preliminary faunal analysis indicates a possible change in resource availability including the local extinction of Bison bison (about 1850 BP).

APPLYING WETLAND RATING SYSTEMS TO ASSESS FUNCTIONS OF WETLANDS CREATED BY MASS WASTING EVENTS

Wachholder, Tommy
Faculty Mentor(s): Anthony Gabriel, Resource Management; Karl Lillquist, Geography; Tom Cottrell, Biological Sciences

Poster Session 2: 11:15-1:45 - Poster #30

The purpose of this project was to measure wetland ecological function in the subalpine region of Table Mountain, Washington. Mass wasting has been the most influential process in shaping the landscape in this area, resulting in many wetlands forming on the surface of landslide deposits. A total of eighteen wetlands were sampled at elevations ranging from 1300m to 1600m, and divided into north and south facing aspects. Using the Washington State Wetland Rating System for Eastern Washington and a modified version of the Wetland Ecosystem Services Protocol for the United States, wetland function was quantified and analyzed to determine whether ecological function in these distinct wetland systems change with elevation and aspect. Additional vegetation community and soil analysis augmented the functional assessments for each wetland. Three transects were used for each wetland to record vegetation data, including species type and quantity. Vegetation analysis included quantification of species richness, diversity, dominant species, and presence of non-native species. In addition, vegetation community similarity coefficients were calculated to describe vegetation similarities between wetlands varying in elevation and aspect. Soil samples obtained from the lowest location at each wetland were analyzed to provide pH measurements and the proportion of organic matter, sand, silt, and clay. Preliminary findings indicate a higher overall wetland function with north facing and high elevation wetlands.
THE ANALYSIS OF NFL PLAYERS FANTASY FOOTBALL STATISTICS

Walker, Jr., Mark
Faculty Mentor(s): Dominic Klyve, Mathematics

Session: 22
Oral Presentation 12:00-12:20 in Room 201

The project will consist of an analysis of over 10,000 National Football League (NFL) players Fantasy Football Statistics from the last 10 seasons which include 2001-2010. The Fantasy Football Statistics that were gathered contain positive and negative integer values or just positive integer values. The two types of tests that will be widely used are multiple regression and ANOVA: For example, several multiple regression tests will be presented and explained to display the relationship demonstrating the effect of the value of different offensive and defensive players' statistics on the number of fantasy football points an NFL player scores for a fantasy football contestant in a game. Specifically, the variables that will be involved in these multiple regression tests will be a quarterback’s season total passing yards, a running back’s season total rushing yards, a defensive player’s season total fumble recoveries and interceptions, and all of the NFL players’ average number of fantasy football points scored in a game throughout a season. In addition, two to three ANOVA tests will be presented and explained to compare offensive and defensive players who each play in separate positions on a team, but accrue statistics in the same offensive and defensive categories.

STUDY OF HOST-TO-ACTIVATOR ENERGY TRANSFER EFFICIENCY IN YBO₃:Tb³⁺

Wallace, Maxwell
Faculty Mentor(s): Anthony Diaz, Chemistry

Poster Session 1: 8:30-11:00 - Poster #3

Inorganic solid-state luminescent materials (phosphors) are used in a variety of technologies including plasma display panels, Hg- free lamps, and computer monitors. There are currently hundreds of synthesized phosphors, each with unique host to activator interaction under vacuum ultraviolet light (VUV) exposure. Host to activator transfer efficiency and photoluminescence properties were studied for Tb³⁺ doped YBO₃ green phosphor under (VUV) excitation. Research was conducted on the activator Tb³⁺ because of the structural similarity to the more common Eu³⁺ activator. Increasing concentrations of the activator were prepared up to 10% Tb³⁺ and were re-fired under hydrogen/argon gas to study any signs of Tb⁴⁺ in the samples analyzed. Resulting data suggest Tb³⁺ doped YBO₃ has a lower transfer efficiency compared to Eu³⁺ doped YBO₃ phosphors.

EFFECTS OF FERAL HORSE GRAZING ON GREATER SAGE-GROUSE NESTING HABITAT IN SOUTHEASTERN OREGON

Walling, Jessica
Faculty Mentor(s): James Huckabay, Resource Management

Poster Session 2: 11:15-1:45 - Poster #31

Grass height and certain shrubs, especially sage-brush, are important to maintaining viable populations of greater sage-grouse. Grazing is hypothesized to impact sage-grouse by reducing the height of herbaceous cover. This would have an impact on important sage-grouse breeding sites and the success of concealing nests from predators. This research will test this hypothesis. Free-roaming horses, which are herbivores minimally managed on federal lands, may have significant impact to perennial grasses as the graze. Using exclosures, vegetation canopy surveys and utilization measurements this study will determine the amount of perennial grass height removed by free-roaming horses on sage-grouse leks in southeastern Oregon on the Riddle Mountain Herd Management Area. The impact of free-roaming horses on sage-grouse habitat will be determined.
MUSIC THERAPY: THE EFFECT OF MUSIC ON DOMESTIC CHICKENS’ LAYING PATTERNS
Wenger, Lauren
Faculty Mentor(s): Hal Ott, Music

Session: 27
Oral Presentation 1:50-2:10 in Room 137A

The focus of my research is whether or not different genres of music affect chickens’ egg production either positively or negatively. Will music make chickens lay more eggs? I want to know if music can be used as a therapeutic or calming tool for animals, or in this case chickens. I used five different types of music (rock, country, jazz, classical, and metal) and played them for a week at a time. I also had control weeks on either end of this five-week period. My testing was centered around the solstices and equinoxes. I also had a control group to compare my results to. The chickens were in a controlled space and the music was played from a boom box at the same volume throughout. I did the same seven-week test three quarters in a row. I found that the chickens responded especially well to the jazz and classical music. On the other hand, metal seemed to have a negative effect. Rock and country seemed to have little effect either way. Yes, music does affect chickens’ laying patterns. Although, contrary to what I thought, metal effects them negatively. I could not acquire a large enough group of chickens to be sure of my results. With a larger group, and more time, this study could be stronger. My discipline in music, and my intended discipline in music therapy, is helped by this study as I have found that music is indeed a tool to be used with animals.

FRONTEND LOADER VS. HYDRAULIC EXCAVATOR: BATTLE OF THE EARTHMOVERS
Whelan, Michael; Plugge, P. Warren
Faculty Mentor(s): Michael Whelan, Industrial & Engineering Technology

Session: 6
Oral Presentation 9:10-9:30 in Room 202

Please see the peer reviewed expanded abstract on page 157.

THE ACID TEST: DETECTING ONE STUDENT’S DISHONEST SUBMISSION OF ANOTHER’S WORK
Whelan, Michael; Cattin, William
Faculty Mentor(s): Michael Whelan, Industrial & Engineering Technology

Session: 28
Oral Presentation 1:50-2:10 in Room 137B

Please see the peer reviewed expanded abstract on page 158.

MANASTASH SHOWCASE
Whitcomb, Katharine; Bayles, Loren; VanScyoc, Aaron; Byrne, Caitlyn; Hovde, Leah; Ham, Preston
Faculty Mentor(s): Katharine Whitcomb, English; Lee Honeycutt, English; Joe Powell, English; Terry Martin, English

Session: 10
Oral Presentation 10:00-11:20 in Room 137A

The English Writing Specialization would like to showcase CWU’s student-edited, student-produced literary arts annual magazine, Manastash. We present a series of short readings of creative pieces by the students whose work is featured in the new 2011 issue of Manastash. Mentor Katharine Whitcomb will introduce the reading with a few words about the magazine and the readers.
CINDERELLA VS. VASILISA: EXPLORING TRADITIONAL VIEWS OF IDEAL FEMININITY IN WESTERN EUROPE AND RUSSIA THROUGH THE LENS OF THE FAIRYTALE

Wildes, Sheena
Faculty Mentor(s): Roxanne Easley, History; Ruthi Erdman, Douglas Honors College

Session: 41
Oral Presentation 3:00-3:20 in Room 301

In this presentation, I compare the well-known Western fairytale “Cinderella” with the Russian fairytale “Vasilisa the Beautiful” in order to illustrate contrasting traditional views of ideal femininity in Western Europe and Russia. Scholars often interpret fairytales either from a psychological perspective, focusing on the hero or heroine’s journey to self-actualization, or from a cultural perspective, focusing on what the tale can tell us of societal norms and expectations. This presentation focuses on a cultural reading of “Cinderella” and “Vasilisa the Beautiful.” First, I review feminist cultural interpretations of “Cinderella” as a tale which embodies traditional Western notions of ideal femininity, teaching young girls to seek romantic fulfillment through marriage to Prince Charming. Then, I apply a cultural interpretation to “Vasilisa the Beautiful.” Previously, this fairytale has only been interpreted from a psychological perspective, but I will argue that a cultural reading of the fairytale sheds light on the traditional Russian ideal of femininity, which focuses heavily on motherhood. The different ideals of femininity in “Cinderella” and “Vasilisa the Beautiful” mirror historical concepts of femininity in the two cultures. Historically, Western European women gained power and virtue through maintaining virginity or becoming a wife or romantic object, while Russian women gained power and virtue through motherhood.

ANALYSIS OF CATHEPSIN-D INHIBITORY COMPOUNDS BY COMPUTATIONAL INTELLIGENCE METHODS

Williamson, Forrest; Hepler, Kristopher; Haberman, Zachary
Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry; Razvan Andonie, Computer Science

Session: 20
Oral Presentation 12:40-1:00 in Room 137B

Aspartic proteases are a therapeutically important class of enzymes that are responsible for the proliferation of disease states such as HIV/AIDS, cancer, Alzheimer’s, and malaria. Having been extensively researched, they are ideal for computational chemists to refine and test new methods. Cathepsin D has become a popular target for drug design as it has become associated with the development of many biological processes, including breast cancer. Highly selective inhibitors must be developed to prevent indiscriminatory inhibition. The intention of this study is to explore how differing computational methods predict biological activities of Cathepsin-D inhibitors. Fuzzy IF/THEN rules are extracted from the neural networks to determine how the networks came to a decision. The rules will be analyzed to find correlations between physico-chemical properties and biological activity.

HATE CRIMES AND THEIR BIASES

Wing, Whitney
Faculty Mentor(s): Dominic Klyve, Mathematics

Poster Session 1: 8:30-11:00 - Poster #24

James J. Nolan, III of West Virginia University, F. Carson Mencken of Baylor University, and Jack McDevitt of Northeastern University set to the task of editing the huge data set of The National Incident Based Reporting System (NIBRS) (an incident-based reporting system for crimes known to the police) into a usable format. They placed their edited and organized data set in public domain, and on the website encouraged people to use it to delve into the knowledge offered from this vast collection of reported hate crimes. The dataset gives information such as age of the victim and offender, the sex, race, time and date of the crime, number of arrests made on people involved in the incident, and the state the incident occurred in. Using multiple regression and ANOVA, I explored the relationship between and among many of the variables to see if there were relationships between race of victim and offender, a statistically significant difference between age of attacker and age of victim, and whether or not gender played a noticeable role in incidents.
COUTURE VS. DEPARTMENT STORE: A STUDENT’S BATTLE FOR FASHION
Witham, Caitlin; Westendorf, Amy
Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management

Session: 5
Oral Presentation 9:30-9:50 in Room 201

The purpose of this study is to find out how high end retailers have been affected by the economy. We will be researching this topic by reading articles and scholarly papers relevant to the topic. We will also be surveying the community of Central Washington University. This includes students, professors, advisers, etc. With the survey we are most interested in finding out about the community’s spending habits and their level of motivation for fashion. As students in the fashion merchandising program, this study holds a high place of interest to us. We would like to find out how our favorite designers have been affected by the economic crisis our country is going through and how this will affect us in the future as we search for careers in this industry.

DAPHNIA ON ICE: ASSESSMENT OF DNA DAMAGE IN DAPHNIA PULEX AT -10ºC
Wooller, Page
Faculty Mentor(s): Alison Scoville, Biological Sciences

Poster Session 3: 2:00-4:30 - Poster #4

Daphnia (water fleas) are a model organism for understanding the genetic underpinnings of adaptation in natural populations. Recent publication of the Daphnia pulex genome has also revealed a high degree of homology between Daphnia and humans compared to other established model organisms, including C. elegans and Drosophila, making research on Daphnia potentially relevant to human health. Although Daphnia are commonly utilized to assess toxicity of environmental contaminants at the whole-animal level, there is currently no established method to assess DNA damage. The purpose of this study is to adapt the use of comet assays to quantify the amount of DNA damage in D. pulex. Daphnia pulex obtained from a natural population were transferred to a dark and cold laboratory environment. Cells were then extracted from Daphnia sacrificed on days 1 and 10 and levels of DNA damage were assessed using the comet assay. Results showed significantly decreased DNA damage following prolonged exposure to dark and cold. This supports the use of our modified comet assay as a valuable and cost effective means of quantifying DNA damage. We conclude that from this data the environmental changes either reduce the rate of DNA damage or increase the rate of repair within D. pulex.

A CRITICAL ASSESSMENT OF CONFLICT THEORY
Wright, Daniel
Faculty Mentor(s): Cody Stoddard, Law & Justice

Session: 34
Oral Presentation 3:20-3:40 in Room 135

Conflict theory has been around for ages and has produced many different alterations throughout the years. Yet the issue remains as to where this theory and its alterations stand in relation to other theories. What actually constitutes a theory is crucial in the determination of conflict theory’s place in the scientific and theoretical world. The idea of conflict theory as a testable working theory, in criminology specifically, faces opposition from many different researchers. This opposition includes researchers such as Darnell Hawkins who in 1987 helped lay the groundwork for the presentation of conflict criminology as a perspective rather than a testable theory. Hawkins and others argue that as a perspective conflict criminology is perfect for predicting select types of criminal and deviant acts such as politically motivated and ideological acts in addition to being great for the prediction and explanation of white collar criminal acts but it is not a testable scientific theory. (Akers & Sellers, 2009) On the other side of this question is researchers like Austin Turk who argue that with some slight alterations conflict criminology can be remade into a working, testable scientific theory (1966). This paper looks into the support of both sides of this argument and looks at each aspect of what makes up a theory with a critical eye, to begin to shed some light on whether or not conflict criminology and conflict theory will be able to be presented as a theory or as something less.
EVERGREEN MAINE SHIPPING CORP.
Yen, Andrew
Faculty Mentor(s): Kun Liao, Finance & OSC

Lynnwood Center Poster Session - Poster #2

Evergreen Maine Shipping Corp. is a Taiwanese shipping company that calls on 240 ports worldwide in 80 countries. It is the fourth largest shipping company in the world. My research will focus on what Evergreen should do when the gas prices rise this summer? How could Evergreen keep their customers’ shipping value (TUE) during the economic depression: sign up contracts with their suppliers (gasoline company) or cooperate with other shipping companies? I will research and analyze these questions.

A EXPLORATORY STUDY OF THE GREEN SOLVENT FOR ORGANIC CHEMISTRY—IONIC LIQUID
Yi, Fan; Kellar, Casey
Faculty Mentor(s): Viorel Sarca, Chemistry

Poster Session 1: 8:30-11:00 - Poster #12

Green chemistry, also known as sustainable chemistry, refers to the design and use of chemicals and processes that reduce substances that are hazardous to humans and the environment. In this relatively new approach to chemistry, emphasis is also placed on maintaining economic viability while minimizing energy use and waste production. Many traditional organic solvents have been implicated as environmental contaminants and are often toxic, volatile and difficult to work with. The search for replacements for these solvents is currently the subject of intense research and is an important agenda for green chemistry. Room temperature ionic liquids have attracted a great deal of worldwide interest for using as “green” solvents because they have a low melting point, minimal vapor pressure, low toxicity and can be recycled. The purpose of this project was to develop a mild and selective synthetic method for the non substituted or mono substituted aromatics with alcohols, 3-methyl-1-pentyn-3-ol, in BMIM [PF2] - the ionic liquid. We employed a readily available metallic triflate, ytterbium triflate [Yb(OTf)3], as a catalyst. Currently, the reaction is been running under mild condition, and the ionic liquid is recycled by evaporating the other reagents under low pressure.

NITRATES IN RAIN WATER
Yoder, Andrew; Hodges, Dave; Helland, Terry;
Faculty Mentor(s): Timothy Sorey, Chemistry

Poster Session 2: 11:15-1:45 - Poster #36

The purpose of my research was to find whether or not the concentration of Nitrate in the rainwater of Ellensburg could have harmful effects on the environment. If there is a spike in concentration, it won’t be anywhere near the limit of 10,000ppb. I collected the rain on top of Ellensburg High School every time that it rained and bottled the samples. At the end of my testing period I put them through a spectrophotometer. The highest concentration that I found was collected on November 30, with a concentration of 848ppb. The lowest was collected on January 4, with a concentration of 28ppb. When I checked with previous research I found that there is always a spike around the same time.
DISCONNECT
Young, Therese
Faculty Mentor(s): Therese Young, Dance
Session: 33
Oral Presentation 1:30-1:50 in Theatre

The creative artistic work I am submitting for SOURCE is entitled Disconnect. The inspiration for the piece came from a musical composition by Stravinsky Histoire du soldat which integrates three different rhythms, the tango, waltz, and ragtime. What appealed to me about the music were the differences in the rhythms and how they constantly change from a feeling of satisfaction or connection to disconnection in a very interesting ragtime out of control rhythm. I found myself creating an association to these rhythms based on current events happening in our community and state. As the budgetary concerns hit us hard this last year I felt a sense of disconnect run rampant through our community. The dance explores the dynamics of trying to connect with others, but it is never quite right; disconnecting and functioning in our own small world; missing the connections completely, looking through others as if they didn’t exist, rejecting connections, and, of course, the short circuiting scenario where we can’t take anymore before we spiral out of control. Note the strength in the opening movement where the dancers are unified in an equalized relationship before the dynamics start to change. This unity is seen again about halfway through the piece, but doesn’t hold as they begin to disconnect from each other. The pace picks up at one point with one group trying to keep up with the other, again a moment of unified clarity and then disconnect. It ultimately ends with everyone going their own way.

MAD DOG TEA
Zapel, Timothy
Faculty Mentor(s): William Provaznik, Management; Carlo Smith, Finance & OSC; Terry Alkire, Management
Session: 7
Oral Presentation 8:30-8:55 in Room 301

Mad Dog Tea is a tea company that provides delicious healthy tea based beverages that perform like energy and sport drinks. It is a tea that would round house kick your taste buds, steal your girlfriend and run off to Cancun. If it had legs. Products: Mad Dog Tea’s first product is RX EnergyTea, a Ready To Drink (RTD) beverage providing a natural, healthy alternative to sugar laden energy drinks. Without the processed formulas of current drinks, RX EnergyTea offers the same performance. Business Benefit: Younger consumers are increasingly health conscious, looking for alternatives to energy drinks. Older consumers look for healthy options to soda; RX EnergyTea and other Mad Dog Tea products satisfy both desires. Market Niche: The energy drink market represents a $10 billion industry, while the tea market represents $7.5 billion, and has been called the “new coffee market” in comparison to the coffee boom of the 1990’s. Further, RTD tea was only one of two beverages with growth in 2009, and the only one showing continued growth (8-15 percent) through the recent recession. Energy Tea enters the niche between the two, which experts say will explode within the next 24 months. Competitive Advantage: Barriers to entry are still very low, start-up costs are minimal, and the process is extremely scalable. By entering first, Mad Dog can gain market share, and combine with economies of scale, can provide an extremely high profit margin. Mad Dog Tea is poised to take advantage of a market ripe for success.
My submission is a piece of choreography that I did in the fall of 2009. I originally choreographed it for Orchesis’s spring conference, but I ended up submitting it to the AAHPERD National Dance Gala. It was accepted to the Gala, along with a piece from my faculty mentor, Therese Young, and I had the incredible opportunity to travel to San Diego in the beginning of April with my dancers to perform at the conference. The piece is titled One Voice and is a look at individuality in a group and the strength of community. Each verse of the music is a different number of voices singing. The first verse starts as “this is the sound of one voice”, the second verse is two voices, the third is three voices, the fourth is “the sound of all of us” and the fifth verse goes back to being one voice. As the verses progress I added another dancer each time and had them doing mostly the same thing but with different twists to show individuality. All five dancers continue dancing through the fourth verse and back into the last verse that is one voice. They are all doing the same choreography at this point, but one person is facing the back. To me this piece shows that “one” can be simply one person like in the beginning or it can be a group of people working together like the last verse.
METAPHORIC STORIES IN FIELD SUPERVISION OF STUDENT TEACHERS

Ballou, Gary
Education

Student teachers rarely have the opportunity to reflect on personal growth during the student-teaching experience. Limited research suggests that metaphoric activities help student teachers to understand the process of becoming a teacher. This self-reflection enhances self-discovery and provides a method for insights and meanings to emerge.

Structured activities for guided reflection can be used to train student teachers in their new roles as teachers (Peace 2000), to help student teachers become clearer about personal values and perspectives (Sax 2006), and to facilitate personal and professional development (Germain 2003). These authors believe that “more qualitative research is needed to understand conditions under which metaphors are successfully introduced as a means to facilitate student teacher development (Guiffrida et al. 2007, p. 339).

In this study, nineteen student teachers participated in a facilitated group discussion of three fairy tales (“The Ugly Duckling” by Andersen, “Vasalisa, the Fair” by Crossley-Holland, and “Sea-Woman” by Crossley-Holland) to examine how the use of metaphoric stories contributes to self-reflection. A basic interpretive approach to analysis was used for this study because it focuses on understanding “how people make sense of their lives and their experiences” (Merriam & Associates 2002, p. 38). Semi-structured interview questions prompted participants to discuss the themes of each story: motivation, autonomy, and self- and other awareness. A transcript of each discussion was created. Repeated, powerful, and/or metaphoric words and phrases were synthesized into sub-themes, which were collapsed into three overarching themes.

Theme 1: Recurring cycles of highs and lows. Participants felt devalued in the school hierarchy as the “bottom of the pyramid.” They felt overwhelmed by the amount of work. Participants also shared positive experiences such as receiving support from mentors.

Theme 2: Challenges in balancing external and internal influences. Participants shared that developing one’s internal sense of direction, inner strength, and self-reliance was essential.

Theme 3: Struggles with self-awareness. Participants shared that the ongoing need for self-awareness eventually had a negative impact on communication with others. Further, many stated that their own story mirrored the metaphoric stories.

Two strategies addressed the potential for researcher bias and helped to establish trustworthiness and authenticity. These included the use of reflective memos during coding and analysis (Charmaz 2002) and the use of peer debriefers (Padgett, Mathew, & Conte 2004). Handwritten reflective memos were completed throughout coding and analysis, and these were sent to two field supervisors who served as peer debriefers. Peer debriefer comments, critiques, and suggestions helped to clarify ideas for coding and theme development.

Future studies should interview individual participants to further clarify the process of using metaphoric stories. In addition, the challenge of time constraints should be addressed.

The presentation concludes with a discussion of further use of metaphoric stories in prompting student-teacher reflection, such as selecting stories with a wider variety of themes to encourage broader self-reflection, and assisting student teachers in applying storied themes to professional goals.

The presentation is particularly useful to teacher education faculty and students preparing for the teacher workforce.

References Upon Request
The 1979 Iranian Revolution is among the most influential revolutions in modern times. Replacing 2,500 years of monarchical tradition with an Islamic theocracy has profoundly influenced Iranian laws, social norms, and the educational system. It has also produced a rivalry between Iran and Israel that continues to influence American politics in the region (Parsi 2007).

What do textbooks really teach, as the official knowledge, in the Islamic Republic of Iran? This study shows that Iranian children are taught a form of citizenship that is based on a blend of Islamic values and a love of the country. Discourse analysis (Fairclough 1995) is used both as a conceptual framework for examining the images, ideas, and values in the text, as well as a method for analysis to reveal the religious and nationalistic values that are taught in schools. For example, lessons and images that appear in Persian and Arabic language courses and history textbooks are classified based on their religious, nationalistic, or other attributes. To illustrate the process, in one colorful drawing, six children are shown at play. Three happy boys appear on the right side of the page and three smiling girls appear on the left side of a new page. Even in this setting, a strict gender separation is communicated and later reinforced in a lesson that shows men and women praying in their segregated spaces. This curriculum promotes a particular ideology at the expense of all other religious groups in the country, which are ignored.

Schools play a major role in socializing the young. Schools in today’s Iran teach a blend of religious education based on Shia Islam and Iranian nationalism in support of government interpreted Islamic values. The content of religious propaganda in the Iranian textbooks is quite explicit. Formal religious training in public schools begins in first grade as students are taught from “The God’s Book” (1389). A typical first image seen in all textbooks is a picture of Khomeini, the deceased leader of the Islamic Revolution. In this first-grade textbook that is about the Koran, Khomeini puts his right hand on a young boy’s head as a gesture of blessing. The caption beneath the image is a quote from Khomeini reading, “You, the elementary students, are my hope.” This message means that for Khomeini’s brand of government to survive, it needs to have willing supporters who are ready to serve the Islamic state. Parents are expected to support the learning of the Koran by signing the bottom of page seven of this textbook. They are told to model good behavior by reading the book with their children. This book appears to target not only children, but also their parents. If parents choose not to sign, the consequences could be severe and they could be investigated by religious minders that are at each school. Schools engage in social control and go beyond teaching the basics.

References Upon Request
Discussions on mentoring characterize it positively as emulative, mutual, and intellectually inspiring for the participants (Beyene et al. 2002; Tang and Choi 2005; Paglis et al. 2006; Cobb et al. 2006; Speizer 1981; Roberts 2000; Kram 1985). A mentor engages in a wide spectrum of roles, including friend, teacher, adviser, and coach, whom the mentee seeks, receives, shares, and follows. The interactions result in reciprocal opportunities for growth between the participants.

Besides skill transmission, Blandford (2000) and others indicate that mentoring involves “the tacit form of knowledge,” and takes place implicitly, spontaneously, and informally in the exchanges of an expert and a novice. There is transmission of cultural capital in intergenerational mentorship (Ramani 2006). A mentee has been observed to be more likely to follow a committed plan, be resilient to challenges, make meaningful interpretations, etc. (Thomas and Hu et al. 2005).

Roberts (2000) stresses the need for ontological liberation in the epistemological inquiry of “mentoring.” Freire’s pedagogy provides a power perspective in analyzing the human relations and social functions of a society. Colley focuses on institutional malpractice in mentoring at-risk youth, cautioning that without the power interrogation from within, mentees can easily be victimized despite good intentions (2002). Roberts (2000), Carruthers (2005), and Barkham (2005) concur that the need exists for critical inquiry into “from whose point of interests (should interests be singular?) the practice serves.”

Responding to the critiques above, the presentation will discuss (is the word “in” necessary in this sentence?) the perspectives as following: first, Freire’s pedagogy of the oppressed underpins the rationale for raising social consciousness of students; second, liberation is the fundamental goal of education by which a mentor empowers the mentee to write about life experiences, assuming the authorship to the construction of his/her own life narratives; third, a worthy mentor exemplifies (exemplifies what exactly? I was somewhat confused by this part of the sentence) by his/her actions and through the existential struggles wherein one’s human essence emerges and fulfills; fourth, the mentor and the mentee stand as enlightened witnesses (Hooks 1994) to the reciprocal opportunities for growth; sixth, the mentee experiences his/her own potential agency or even his/her own possible activism “vicariously” from the mentor’s courageous example of action.

References Upon Request
TRAVEL AS A TRANSFORMATIVE EDUCATION
Lea, YiShan; Vilieger, Hannah; Dinwiddie, Michelle; Kiel, Dakota; Milne, Rachel

Education

It has been observed that globalization has emerged to dominate the public discussions and concerns of our time. In the enterprise of education, which raises social consciousness, awareness of impacts of globalization in the local and personal life is an urgent topic of learning and teaching. An experiential, travel-based curriculum is necessary to accomplishing such aims. At this pivotal time, travel potentially stretches our imagination and aides in our capacity to rise above, to comprehend the global communities through authentic experience, and to familiarize ourselves in bio-diverse spheres different from ours.

The cultural curriculum of travel intends to educate students to be cultural critics of the world and develop global consciousness. A critical culture/action-based curriculum brings students intimate contact with diverse communities. It sharpens the consciousness of the mind to develop a repertoire and reservoir of culturally relevant solutions and creative possibilities. Travel can provide authentic cultural knowledge and develop intercultural reflexivity.

This presentation aims (simply not to use the word “intends” twice in two paragraphs) to deliver a preliminary conceptual frame on travel in relation to the development of global consciousness as described above. The theme of the presentation centers on the awakened consciousness of individuals during their travels. In their own words, their experiences guide the readers to see the new worlds. The analyses of the students’ narratives are approached in two creative perspectives. First, as separate individuals, their interpretations of travel experiences are examined by a matrix of relations: awareness of the self, awareness of multiple worlds, and the expressed sense of agency influenced by the travel. Second, in spite of the experiences by different individuals, a lens merging the diversity into a continuum of one person’s life across time provides greater insights for educators to envision the potential possibility of changed consciousness that travel can offer.

The narratives will be studied by way of content analysis from selected autobiographic narratives on travels by seven college students of junior status in the United States. In addition, two inspirational narratives on travel are included to denote the real-life examples of dedication and possibility: one is “The Motorcycle Diaries” (Guevara 2004), and the other, “Truth or Consequences” by R. E. B. (2002).

References Upon Request
At community kitchens people can come together, cook, often share a meal, and take home servings of what they make. They are usually designed to promote healthy eating and improve food security. Last spring I initiated the Ellensburg Community Kitchen.

Since funding began last summer, I have planned and implemented monthly kitchen sessions at a local food bank, attracted student volunteers, participants, and an undergraduate research assistant who is exploring the possibility of bringing the strategy to campus. I have also been invited to present to community groups. The kitchen began as an outgrowth of service with a potential community health impact.

However, it is now a cornerstone of my scholarship, viewed through Boyer’s lens of application/engagement and teaching (Aiken et al. 2006), a model with which to approach community scholarship. According to Boyer, such scholarship solves problems and ties the university to the community, helping us speak each other’s languages as well as educate and entice future scholars.

Community kitchens build new and unlikely connections among diverse people and partners, improving healthy food access and use, with these benefits becoming apparent as kitchens continue to meet. Participants have included undergraduate and graduate students, university janitorial and clerical staff, as well as an administrator, food bank clients and volunteers, and two Ellensburg mothers with young children. Although some differences (such as age) are obvious, others (such as economic need) often are not. All participants are there to learn more about cooking, build confidence, and eat more healthfully. People talk, laugh, eat, and think together. Additionally, as the kitchen has progressed, so has the conversation around funding opportunities, and other practical work and support for building community food security in Ellensburg. As students have expressed interest, participated and volunteered, and even committed to individual research surrounding the possibility of bringing a kitchen to campus, we are building ongoing, relevant scholarship and programming opportunities.

To measure the quantifiable outcomes of the kitchen itself -- i.e., whether participants feel more confident in preparing meals that include fruits and vegetables -- I developed a brief pre- and post-survey tool. Each participant completes the pre-survey the first time she or he participates, and the post-survey after every session so that the impacts of specific sessions can be determined. Although the survey data will minimally portray the kitchen’s impact, given the current small number of participants a more qualitative approach--common to community scholarship--is needed and desirable. Thus, I am planning focus groups and key informant interviews to be held at the end of the first fifteen funded months, as well as seeking funding for Photovoice-style documentation of participants’ food practices and the local community’s food environment.

Assessing this work as scholarship, according to the Boyer lenses and similar standards of community scholarship, will involve standards (including goals, preparation, and methods among others) and products (such as resources, program outcomes, and dissemination) of such scholarship (Maurana et al. 2001). I will be presenting the ways my work reflects such standards and provides such products.

References Upon Request
The American Society of Civil Engineers (ASCE) for many years has rated our nation’s infrastructure system as a D (poor) in overall functionality. Our infrastructure system is generally classified as incorporating all of the systems we use on a daily basis such as roads, bridges, water and wastewater transportation, gas transmission, power generation and transmission, and communication systems. As time has progressed many of our infrastructure systems continue to age and are in need of repair or substantial improvements to meet the current demand society places on these systems. A subcategory included in our aging infrastructure is our utilities used on a daily basis such as water, power, gas, sewer, and communications. The utilities we use are in need of significant repair due to age, increased demand, and more efficient technology to provide these utilities to the user. There are impacts associated with the design, construction, repair, and maintenance of these systems.

Many different factors could be analyzed in the life cycle of utility design, installation, and maintenance. The life cycle of utility construction includes pre-construction – the process of design and land acquisition, construction – installation or construction, and post-construction – the maintenance and decommissioning of the utility system. Factors commonly seen during construction and post-construction phases will generally have the most impact on the environment, especially during an open excavation to construct a utility. Other factors which impact the placement of utilities during construction include vehicular traffic disruption, road and pavement damage, noise and vibration, damage to other existing structures, air pollution, pedestrian safety, business and trade loss, damage to detour roads, site and public safety, citizen complaints, and environmental impacts (Najafi & Gokhale 2005).

The purpose of this paper is to explore and analyze the processes being used to repair and construct our utility systems and research their impact on the environment. This paper will perform an analysis of the costs associated with a major repair on a utility system using an open excavation process versus utilizing an alternative technology or green technology, trenchless construction, to reach the same end result in upgrading and maintaining an aging utility. To identify the costs of the two different methods, the research will utilize a waterline pipe construction and replacement model to expose the differences and impacts associated with a typical open excavation utility replacement and trenchless technology, a “greener,” or more environmentally sound, approach to utility replacement and construction. It is hypothesized that the impacts associated with utility replacement and construction would be lessened by using trenchless technology instead of an open excavation.
Internships are a three-way partnership between industry, academia, and students. Opportunities presented during an internship allow the student to be exposed to real-life situations within their discipline of study. They also provide an opportunity for industry sponsors to identify whether the student would be a good fit as a professional within the organization’s culture of doing business. In academia, the internship provides the student the opportunity to use their experience in the field to expand on content learned in class.

Construction internships are a vital component to a student’s education in order to formalize their decision whether or not to pursue a career in construction management. Part of the formalization process for a construction management student is to determine which area of construction the student is most interested in, whether that is building or civil construction. This is important because students can focus their studies in a certain discipline in construction to enhance their learning experience and increase their potential to become a good construction managers.

Typically during construction management internship, students are exposed to a wide variety of field and office operations. Some students will be given a small project or a component of a larger project to manage in terms of the time, cost, quality, and safety requirements. This project will qualitatively analyze data gathered by students on internships in the form of written journals and empirical evidence to expose themes of subjects students are learning during the internship process. The themes will represent items or data that will be organized and categorized into groups, which represent core classes students take within the construction management program. Comparisons will be made between and within the groups to identify academic subjects students focus on during their internships.

Types of data to be analyzed from students include journals and empirical evidence collected by the students during their construction internships. The journals consist of written observations of what the students were confronted with on a daily basis. Students typically are involved with making basic management decisions related to the overall management of a construction job within the parameters of the construction project’s plans and specifications. Students are also mentored by a more experienced field supervisor in the management processes they undertake for a specific project. As students experience these situations, journals are kept to provide reflection on what was experienced between the mentor and student. Other empirical evidence students collected related to the overall management of the job include project schedules, submittals, interpretations of plans and specifications, cost and time change documents, and communications with subcontractors, suppliers, and owners during the construction process. Journals and empirical evidence are then organized and presented to the professor as a portfolio of the student’s experience during the internship.

Between the journals and empirical evidence, it is hypothesized that students are learning the proper management techniques to efficiently manage a construction project. What this paper will expose are the management techniques and situations construction management students are engaged in to help prepare them for their careers in construction management.
An adherence to the educational theory of Constructivism is part of Central Washington University’s Center for Teaching and Learning program theme in which children actively “construct knowledge” and teachers facilitate by providing an interactive environment open to students’ curiosity and experimentation. Taking many forms, Constructivism includes using teaching manipulatives, learning centers, critical thinking questions, and intentional student groupings in order to best stimulate students’ desire to understand and create their own schema.

This research examines the educational theory of Constructivism and how it may relate to student teachers’ effective classroom management. One-hundred and twenty-three Central Washington University student teachers were anonymously and voluntarily surveyed over four quarters using a two-page questionnaire. All of the research participants were student teachers who were placed for their experiences in Pierce or Thurston counties, though many had originally taken coursework at Ellensburg or Des Moines, Green River, or Pierce College sites.

The questionnaire included three sections. Section I of the questionnaire asked for identification of courses in which the student teachers/participants had received instruction on classroom management and Constructivism. Section II asked student teacher/participants to assess their agreement/disagreement with nine statements regarding classroom management and Constructivism using a five-point scale. Section III included questions regarding the student teacher/participants’ philosophy of classroom management and ultimately how their philosophy may be aligned with the tenets of Constructivism. One-hundred percent of the student teacher/participants responded that they had received instruction in both Constructivism and classroom management, while 15 percent of student teacher/participants believed that they had not received enough instruction in using Constructivism in the classroom. Approximately 89 percent of student teacher/participants agreed that they adhere to the philosophy of Constructivism in their teaching, offering a wide array of personalized responses when asked to describe their educational philosophies. Eighty-five percent believed that Constructivism and classroom management are related. One respondent wrote, “Constructivism says that the student constructs their own knowledge. This can be translated into classroom management through promoting democratic principles in the classroom and involving students in rule creation.” Others did not seem to find a strong connection between the use of constructivist teaching strategies and classroom management. One student wrote, “I believe that some of the Constructivist theory is all right, but students should not be expected to be constantly entertained, and the same goes for classroom management—they should learn to behave on their own.”

This research and its implications are especially important as Central begins its adoption of the new teacher state assessment, the Teacher Performance Assessment (TPA), an instrument directly related to a shift in emphasis from K-12 teacher directed teaching to K-12 student directed learning. The TPA requires student teachers to show increased engagement of their students in a variety of active learning tasks similar to suggestions included in constructivist doctrine. A further analysis of the data collected from these questionnaires may enable Central professors to more clearly define Constructivism in their own teaching and offer student teachers relevant approaches to effectively manage students by fully engaging them in learning.
This quantitative study examines correlations between sociodemographic data, access to arts curricula at the middle level, and remedial courses established after the passage of the federal No Child Left Behind Act. Designed as a case study of one of the fifteen largest school districts in the United States (N = 25,786), this research employed causal-comparative analyses in order to illuminate discrepancies between access to the broad curriculum and a narrowing of the curriculum through mandated remedial coursework for specific populations. Findings indicate certain minority students and males are overrepresented in remedial classes, and that students in remedial courses are underrepresented in elective arts classes. These findings may point to a new form of stratification within schools, even as local policymakers and administrators mandate remedial coursework in order to ensure equitable access to college preparatory curriculum.
The focus of this research is to survey the perceived benefits of cooperative education based on selected empirical studies in North America, Europe, and Asia. This research is the first step of our meta analysis to statistically verify the benefits for employers that participate in cooperative education.

We analyzed ten empirical studies in North America. The results showed that employers receive benefits such as better recruitment yield, better job performance, cost savings in recruiting and training, better management skills, more advanced learning skills, and self-motivation.

An analysis of four empirical studies in Europe indicated that employers enjoyed almost identical benefits as their North American counterparts. Additionally, European employers observed that cooperative education graduates have better technology skills, more innovative ideas, increased learning skills, better teamwork skills, better communication skills, and a higher retention rate upon employment.

In Asia, employers thought that cooperative education graduates could effectively apply theoretical concepts to industrial reality. This was an important factor in Asia, where college level education focuses more on theoretical studies instead of more vocational learning. In addition to this benefit, Asian employers considered the graduates better team members who could lead team activities with better knowledge and interpersonal skills.

Based on this research, we found that there are universal benefits of cooperative education programs. However, we also found there are some indigenous differences. For example, in Europe, lifelong learning skills, as well as technical learning skills, were considered more valuable compared to employers in the North America and Asia. In Asia, interpersonal skill was considered more important. North American employers valued cost benefits in human resource management, such as recruitment, training, and retention management.
Constructors have traditionally selected front-end loaders to load significant quantities of geotechnical materials into a truck, hopper, or other similar small target. In the last decade or so, however, the hydraulic excavator has almost totally replaced the front-end loader as the machine of choice to load stockpiled materials. This change in equipment selection has been observed throughout the United States, so it is not just an isolated occurrence. Hydraulic excavators operate on top of a stockpile, undermining its position with each cycle while simultaneously trying to hit a relatively small target; this does not appear to be the best solution to the material-handling problem.

The extensive use of hydraulic excavators to load stockpiled materials gives rise to the question, “Why was this change in process made?” In response, at least three possible hypotheses arise that might answer this question:

1) Hydraulic excavators have become more productive than front-end loaders in accomplishing the task. If true, then hydraulic excavators would, of course, be selected for use when the volume of material justifies this alternative.

2) Hydraulic excavators are, in fact, less productive than front-end loaders, but optimization of total project costs dictates that a less productive machine be used. This would particularly be true if the excavator were already onsite for other earthmoving operations.

3) Hydraulic excavators have replaced front-end loaders not for productivity reasons, but because construction personnel are more familiar with excavators, already own or have leased excavators, and/or need the more versatile excavator onsite for other reasons. Selection of the excavator to load stockpiled materials, then, is based on convenience and familiarity rather than primarily for productivity or financial reasons.

We believe that the first hypothesis is the primary reason for the change. To prove or disprove this hypothesis, we propose a two-step study, the first of which will be completed and results presented at Source 2011. The first step is to determine the probable productivity of the two equipment configurations based on the empirical procedures presented in the Caterpillar Performance Handbook (2010). The second step of this study would then be to validate the empirical procedures by conducting a time-and-motion study comparing front-end loaders and hydraulic excavators based on actual field measurements. Should the first hypothesis prove to be false, or an incomplete explanation for the change in equipment selected, then we will propose further studies exploring the validity of the remaining two hypotheses.
Verifying the authenticity of student work is a pervasive problem on many university campuses. Written work by students can be electronically compared to comprehensive databases of previously created materials to determine excessive levels of copying, cutting-and-pasting, and unreferenced material that characterize a lack of original content and effort. Numerical problem solutions can be visually compared across a class-wide range of submitted assignments in hopes of detecting suspicious similarities in solution procedures (although it is worth noting that similarities appearing in erroneous solutions are often more revealing than those found in correct solutions). Manufactured projects produced for competency-based classes, however, do not readily lend themselves to either electronic or visual comparisons in an effort to verify originality. For that reason, such projects are largely created under the watchful eyes of the course instructor to verify their probable origins.

This paper, then, describes efforts to establish the authenticity of one student’s work submitted for credit in a Central Washington University engineering technology course when the work was performed outside of class and the watchful eyes of the instructor. The particular item in question was a simple project that is routinely produced in the basic level machining course. Each student identifies his/her project by stamping a set of initials into the surface of the item. Careful sleuthing to determine the improbability that the project submitted was in fact produced as an original product for the course by this student was the first step to be performed. Next, the item in question was subjected to a close visual inspection in an effort to locate identifying marks that would reveal the initials of who had originally created the item. Finally, the item was treated with a weak solution of muriatic acid in an attempt to reveal letters (initials) stamped into the metal’s surface.

Results of the sleuthing determined that, while the student claimed to have produced the product in an off-campus welding shop, the quality of work could not have reasonably been accomplished in a normal welding shop. Further, the student had rarely been in class during the term and had not picked up his/her lab supplies from the instructor. These lab supplies included the necessary materials and parts to machine and fabricate the item that was eventually turned in to the instructor. The results of the visual inspection were unfortunately inconclusive since the grinding of the underside of the item had very effectively destroyed the fabricator’s initials. Results of the acid treatment, however, were very conclusive and effective in establishing that the item submitted was not done by the student in question.

Unbeknownst to the student, when letters are stamped into the surface of a metal, the dies not only imprint the letters, but they also disrupt the crystalline structure of the adjacent material. While grinding is very effective in removing the surface indentations of the letters, it is not normally effective in removing the disrupted crystalline patterns. Treating the area with a muriatic acid solution has the effect of making the letters visible again. The ability to detect when a student has been dishonest with his/her claims of originality for work performed is at the heart of being able to ensure ethical behavior. Partially as a result of being able to make this determination, the student received a failing grade in the course.
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