4th Annual Minnesota Conference of Undergraduate Scholarly and Creative Activity

Monday April 13, 2015
Welcome to the Fourth Minnesota Conference of Undergraduate Scholarly and Creative Activity

Minnesota Undergraduate Research Council

Bemidji State University, Troy Gilbertson
Inver Hills Community College, David Higgins
Metropolitan State University, Jennifer Schultz
Minnesota State University Moorhead, Oscar Flores
Minnesota State University, Mankato, Carlos Panahon and Karla Lasssonde
St Cloud State University, Carrie Barth
Southwest Minnesota State University, Emily Deaver
Winona State University, Mingrui Zhang and Michael Delong
It gives me great pleasure to introduce you to the Fourth Annual Undergraduate Scholars Conference, which celebrates undergraduate research at Minnesota State Colleges and Universities. The conference fosters collaboration and partnership among students and faculty across many of our campuses, and highlights their scholarly and creative accomplishments. Undergraduate students and their faculty mentors from seven universities and four community and technical colleges will meet in Winona to share their projects representing a broad set of disciplines.

Minnesota State Colleges and Universities provide students with an extraordinary education that meets their personal and career goals, enhances the quality of life for all Minnesotans, and sustains vibrant economies throughout the state. Hands-on research experience not only enable our students to participate in the process of discovery, it also builds curiosity, creativity, imagination, and teamwork. This annual conference makes a milestone for students to celebrate and share their discoveries and to celebrate the collaboration among our colleges and universities.

Thank you for participating in the 2015 MnSCU Undergraduate Scholars Conference.

Steven Rosenstone
Chancellor, Minnesota State College and Universities
Welcome to the fourth annual MnSCU Undergraduate Scholars Conference. It is a great honor for Winona State University to host this conference. It is our hope that the presence of this event on the campus of WSU will aid in the continued growth and success of undergraduate research throughout MnSCU.

Winona State University holds, as part of our mission, to be “a community of learners improving our world.” This is reflected in our commitment to undergraduate research across the entire campus. This community begins with the collaboration of an undergraduate student and faculty mentors as they work to address issues relevant to their discipline. The community grows through students sharing their work with other students, faculty, and citizens of the Winona area at our annual Judith Ramaley Celebration of Research and Creative Scholarship, which is now in its 9th year. This year, we have the good fortune to expand this community to other students and faculty within the MnSCU system! Our hosting the conference will further instill the significance of undergraduate research across our campus and beyond through the exchange of ideas, methods, and views of the many fields of study found across our campuses.

We are proud to host the MnSCU Undergraduate Scholars Conference and committed to doing our part in making this conference a showcase that demonstrates the value of research to our educational programs.

Sincerely,

Scott R. Olson
President, Winona State University
Acknowledgement

This event would have not been possible without support provided at Winona State University and the administration, staff, and faculty of MnSCU and our sister institutions. Thanks to President Scott Olson and Provost Pat Rogers for providing financial support and for their commitment to undergraduate research. We are also very appreciative of the continued support by John O’Brien and Lynda Milne of the MnSCU office of Academic and Student Affairs. Ann Durley and Blandine Berthelot, WSU Office for Camps and Conferences, provided all logistical support from registration to campus housing (and everything in between). Joe Reed, Stephanie Smidt, and Toni Zaborowski, Student Union, provided excellent support in helping us identify the best spaces to use for the symposium and were tolerant of modifications made along the way. Sarah Delano, Marking and Communications, built and maintained the symposium website and we also thank her for the many additions we requested along the way. Pat Malotka, Creative Services, design and lay out of this program. As always, the staff of Facilities Services provided excellent support setting up the event. We also thank Tom Hill and Stephanie Stango, Teaching, Learning, and Technology Services for ensuring that all technology used for the event was in good working order and Doug Johnson, IT Services, for the use of laptops for student presentations.

Of course, the symposium would not be possible without the students and faculty of the MnSCU institutions for their commitment to quality education and the initiative to engage research and creative scholarship as part of the educational experience. This includes the members of the MnSCU Undergraduate Scholar organizing council whose insights and passion for undergraduate research and scholarships have developed and sustained this celebration of our students.

Sincerely,

Mingrui Zhang, Ph. D.
Professor of Computer Science
8:45 – 10:15 a.m.  ORAL SESSION I

Room 223  Moderator: Emily Deaver

PRESENTATION #19: Variation in Turtle Capture Rates over Summer Months in Clay County, Minnesota, Scott Buchholz and Blair Posusta

PRESENTATION #119: A Genetic Based Approach to Management and Stocking of Muskellunge, Douglas Zentner

PRESENTATION #106: Migration and Size Variance of Larval Northern Pike (Esox lucius) in the Tamarack River, Nathan Stott

PRESENTATION #40: Fossil Fuel Free Fish House, Hunter Edberg and Randall Riehl

PRESENTATION #50: Quantification of Phenolics in Kombucha Tea, Patrick Hager

PRESENTATION #123: Xenopus Embryo Development upon Exposure to Downstream Water from an Effluent Plant, Jaden Witt

Room 225  Moderator: Laura McCauley

PRESENTATION #4: Temperatures of 2-D Rings, Brandon Allen

PRESENTATION #74: Uprights, Robert Mahrer

PRESENTATION #63: RPG Grid Brawl: A Study of Artificial Intelligence Using a Board Game, Jackson Kisling

PRESENTATION #49: Right Tetrahedron: Pythagorean Quadruples, Shrijana Gurung

PRESENTATION #37: How does additive manufacturing process parameters affect the material properties in stainless steel – bronze composite?, Michael Doyle

PRESENTATION #122: Visualizing Elementary Complex Functions, Tianxia Jia

Room 244  Moderator: Cassandra Schreiber

PRESENTATION #70: Subgroup Pro-Ana, Julia Lautizi and Trae Boldthen

PRESENTATION #39: Life as an Undergraduate TA: Sustaining Life Student/ Peer Relationships in the Classroom, Jessica Dulz and Randall Riehl

PRESENTATION #101: Student Ratings of Female Professors with Foreign-Accented Speech at Minnesota State University Moorhead, Johanna Scheu

PRESENTATION #84: Special Education Teacher Training and Knowledge of Behavior Assessment and Intervention Practices, Jennifer Nelson and Lauren Bennewitz

Room 246  Moderator: Heather Sklenicka

PRESENTATION #91: Intercultural Communication, Service Learning, and the Study of Poverty Abroad, Daniel Perno

PRESENTATION #75: The Communist and Democratic Influence on Russian Ballet: From the Soviet Union to Russia, Brenda Martinson

PRESENTATION #1: Effect of different Factors on the Number of Photovoltaics Installation in the US, Iwnetim Abate

PRESENTATION #96: Monstrosity from the Medieval to the Renaissance, Jessica Reich

PRESENTATION #87: Children as Monsters are the Products of Society, Kyle Olsen

PRESENTATION #68: St. Marina: A Lesson in Spiritual Endurance, Samantha Koshowany-Wilken

Room 252  Moderator: Chip Panahon

PRESENTATION #72: American Sniper and Self Loathing, Benjamin Lencowski


PRESENTATION #47: The Little Mermaid and the Fear of Change, Shandy Giron

PRESENTATION #15: Bones of the Soup: An Exploration of J.R.R. Tolkien’s Methodology, Devan Bierbrauer

PRESENTATION #67: Why do people become bullies? Debra Koenig

PRESENTATION #24: American Hopes and Fears in The 100, Raul Cervantes

River Room  Moderator: Mingrui Zhang

PRESENTATION #77: Budget Surpluses of the 1990’s, Krista Migneault

PRESENTATION #56: Masculinity in the Shawshank Redemption, Sean Hudson

PRESENTATION #99: A Fantasy Farmer, Marten Salfer

PRESENTATION #6: Biblical Influences on MLK’s “I Have a Dream” Speech, Rayne Anderson

PRESENTATION #65: Better Than You: America’s Distaste for The Mentally Disabled, Kaylie Knipe
PRESENTATION #5: The Effects of Teleoanticipation on Power in Powerlifters, Chris Ampe, Garrett Conn, Brad Gillingham and Brittney Anderson

PRESENTATION #7: “I am a gym-goer”: Self-as-Doer Identity Predicts Physical Activity Behaviors, Claire Arvidson and Courtney Swanson

PRESENTATION #8: Reaction of 1-{2-[diphenylboryl]benzyl}-2,2,6,6-tetramethylpiperidine with hydrogen, Taysir Bader and Kshitij Gurung

PRESENTATION #14: Self-as-Doer Identity and Exercise Activities: A Qualitative Analysis, Ryan Berres

PRESENTATION #17: High PT Jet Analysis Using Monte Carlo Simulation, Kevin Brom

PRESENTATION #18: MN Child Welfare Considerations for African American Families, Tossia Brown, Barbra Elfstrand, Micheline Mutombo Floyd Harris, Katie Peters, Shari Roach and Marcy Vang

PRESENTATION #20: Detecting emotional expressions with missing features, Nyabang Buom, Rita Fonder and Mark Jankowski

PRESENTATION #22: WSU Students’ Opinions and Habits on Organic Food, Oksana Carlier

PRESENTATION #23: Case Study: Ankle-brachial index in Postural Orthostatic Tachycardia Syndrome (POTS), Annette T. Carr

PRESENTATION #27: Comparative Trematode Biota of Healthy Waterbirds Harvested from Lake Winnibigoshish Minnesota, Timothy Christopherson, James Mitchell, Miriah Linville, Okhumhekho Kassim and Connor Hutton

PRESENTATION #53: Classroom Prevalence of Methicillin Resistant Coagulase-Negative Staphylococcus Species Isolated Students, Samantha Holien

PRESENTATION #54: The Precarity of Safety: Bystander Intervention Praxis as a Challenge to Systemic Violence on Campus, Emily Homan, Mike Krug, Sarah Swanson, Jacob Stock and Kyler Steffe

PRESENTATION #55: Design and Synthesis of a Novel Indanone Chemotherapeutic Agent, Sarah Hopfner

PRESENTATION #57: Seasonal hemoglobin gene expression in tiger salamanders (Ambystoma tigrinum), Ethan Huffington

PRESENTATION #59: Analyzing the Pharmacological Effects of Picrotoxin in Regenerating and Intact Dugesia Tigrina (Planaria) Worms, Shruti Jagannathan

PRESENTATION #61: Energy Use Implications of Responsive Design Websites on Mobile Devices, Sean Kelley

PRESENTATION #62: Passive Folding Model for Deformation of Nemo Group During Final Suturing of the Wyoming and Superior Province, NE Black Hills, South Dakota, Benjamin J. Keute

PRESENTATION #66: Interpreting variably-oriented folds within the Nemo Shear Zone, northeast Black Hills, South Dakota, Alex Koerber

PRESENTATION #69: Effects of Three Land Management Regimes on Small Mammal Abundance at Grand Forks Air Force Base, North Dakota, Lynda LaFond

PRESENTATION #71: Effect of steroid hormones on neurogenesis in the brain of the green anole lizard, You Na Lee and Jaeyoung Son

PRESENTATION #73: Wear properties of 3D printed Stainless Steel-Bronze Composite, Hunter Ludwig and Tad Joel

PRESENTATION #76: How Rural Families Cope when a Loved one is Diagnosed with an Eating Disorder, Alexis McCall

PRESENTATION #79: “Are there things that we missed?”: A Qualitative Exploration of Experiences of Academic Achievement in Collegiate Athletes, Angela Miller, Ashley Forman, Daniel Gitto and Alex Russell

PRESENTATION #80: Establishment of a system using THP-1 human monocytes to distinguish between myeloid differentiation primary response gene 88 dependent or independent pathogen associated molecular pattern signaling, Abdihakim A. Mohamoud, Mary Soderlund, Abigail Schraufnagel and Rachel Dahl

PRESENTATION #83: Non-Profits: Where Should We Donate our Dollars? Patricia Muras, Troy Saleskew, Devan Solheid, Erica Stiller and Mai Nou Yang

PRESENTATION #85: Petrologic and Geochemical Characterization of Archean Gneisses in the Little Elk Terrane, Black Hills, South Dakota, Christopher M. Nicosia

PRESENTATION #120: Country Risk and its Effects on Institutional Investment Fund Flows: Evidence from Mexico, Pengyu Qian
12:30 – 2:00 p.m.  ORAL SESSION II

**Room 223**  
**Moderator:** Damiano Fulghesu

**PRESENTATION #3:** Modeling Of Petroleum Generation, Williston Basin, North Dakota, **Fayaz Ahmed**

**PRESENTATION #2:** Modeling GaAs Solar Cells: Python Code to solve 1-D semiconductor Equations, **Iwnetim Abate**

**PRESENTATION #46:** Phycocyanin Fluorescence in the Denaturing of Phycobiliproteins in the Laboratory Setting for Allied Health Students, **Amber Godfrey**

**PRESENTATION #121:** The Isoperimetric Inequality, **Pratik Dahal**

**PRESENTATION #35:** Analysis of pi-zero decays produced by neutral current muon neutrino interactions, **Tad Dolphay**

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**Room 225**  
**Moderator:** Michael Delong

**PRESENTATION #78:** Sex-selective abortion, eugenics, and embodied citizenship in post-independence India, **Linda McBrayer**

**PRESENTATION #36:** Racial Microaggressions in American Indian Healthcare, **Amber Dorr**

**PRESENTATION #43:** An Overview of Evidence Supporting Primary Production of Glassware in Amarna, Egypt, **Marilyn Evenmo**

**PRESENTATION #112:** Money and Social Class in Titanic and The Purge, **Julie Velasquez**

**PRESENTATION #118:** The Garden of Forking Opinions: Lugones and Borges on Science, **John Zehnder**

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**Room 244**  
**Moderator:** Cassandra Schreiber

**PRESENTATION #25:** Determining common factors that influence academic success in Allied Health, **Alice Chan**

**PRESENTATION #26:** A Study of the Correlation between Traumatic Experiences and Movement Memory, **Alexa Chouinard**

**PRESENTATION #115:** Comparing the Reliability and Sensitivity of Observational Systems for Postive Behavior, **Jessica Wiswell and Nicole Thompson**

**PRESENTATION #116:** Labor Exploitation in Juarez, Mexico: Gender Issues in the Maquiladoras, **Jane White**

**PRESENTATION #44:** Saint Margaret, Queen of Scotland, and the Benedictine Rule, **Amanda Goedeke**

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**Room 246**  
**Moderator:** Jennifer Schultz

**PRESENTATION #28:** Dämmerschlaf: A Time of Twilight and of Sleep, **Gabrielle Cohrs**

**PRESENTATION #82:** The Boar-Image in Medieval Scandinavia, **Rachel Munson**

**PRESENTATION #89:** Pursuing the Saddle Point: Social Science vs. Natural Sciences, **Gilbert Penaherrera**

**PRESENTATION #52:** Present-Day Imperialism, **Colin Helfenstein**

**PRESENTATION #104:** Who do we blame for genocidal hatred? **Farhiya Soldad**
PRESENTATION #9: *A Look at the Kent State Incident Through Event, Experience and Myth*, Jeremy Baert


PRESENTATION #10: *Female Circumcision: Mixed Emotions*, Aida Bamutye

PRESENTATION #60: *A War on Two Fronts: Historic Competition Illustrated Through the Nissan GT-R and Chevrolet Corvette*, August Kammueller

PRESENTATION #12: *Code of ethics and corporate culture within collegiate and professional sports*, Antwan Battles, Erin Hoffmann, Grant Ignatius, Braydon Koball, Ben Larson, Mitchell Pitek, Alyssa Riles and Zoe Waite
PRESENTATION #29: Esterification of Acid Chlorides, Ryan Colakovic

PRESENTATION #32: Seasonal Evaluation of Camden State Park’s Prairie Pothole, Mikeal Cooper

PRESENTATION #33: Characterizing Oxide & Sulfide mineralization in the Nemo Shear Zone, Black Hills, SD, Seth Cordry

PRESENTATION #34: Foundations for Characterizing a NaI(Tl) Crystal Using Alpha Spectroscopy, Rose M. Coughlen

PRESENTATION #38: Improving Newborn Outcomes with Kangaroo Mother Care (KMC), Brianna Droubie and Kelly Douglas

PRESENTATION #41: Plant-fish interactions in an experimental aquaponics system, Ashley Eder, Benjamin LeMay

PRESENTATION #42: Effects of Mown Paths on Small Mammal Movements in Clay County, Minnesota, Ashley Eder and Nikholai O’Hara

PRESENTATION #45: Detecting deception: How do people distinguish between truth-tellers and liars? Jessica Cole and Shelby Flegel

PRESENTATION #48: Media Usage and Learning Outcomes among Sociology Students, Melanie Graves and Ben Keilholtz

PRESENTATION #51: Carbohydrates and Artificial Sweeteners: A New Optical Rotation Laboratory for Allied Health Students, Daniel Heerema

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PRESENTATION #97: Evaluation of the intrinsic surface charge of a layered silicate soil, Samantha Ritter

PRESENTATION #98: Exploration and Analysis of Lipid Content in Canine Food, Allison Rogich

PRESENTATION #100: Functional Movement Screening in Active and Sedentary Men and Women, Kaley Scearcy and Megan Evert

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PRESENTATION #105: Investigating Shear-heating Model for Leucogranite Generation within Archean Basement, Black Hills, South Dakota, Sheryl I. Stephenson

PRESENTATION #107: Toward a comprehensive integration of calorimetry across the curriculum, Olaf Summers and Briana Bruske

PRESENTATION #109: Urban Turkeys: Use of a Random, Stratified Survey of Homeowners in the Fargo (ND)-Moorhead (MN) Area to Estimate Turkey Distributions and Numbers, Human-Turkey Interactions, and Public Opinion on Turkeys, Elisabeth Teige and Angela Kooren,

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Iwnetim Abate
Matthew Craig (Faculty mentor)
Minnesota State University Moorhead
*Modeling GaAs Solar Cells: Python Code to solve 1-D semiconductor Equations*
Format: Oral

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Department of Geology, Minnesota State University, Mankato
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Format: Oral

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Format: Poster

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Devan Bierbrauer
Larry Swain (Faculty Mentor)
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Format: Poster

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Variation in Turtle Capture Rates over Summer Months in Clay County, Minnesota
Format: Oral

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Psychology Program, Southwest Minnesota State University
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Format: Poster

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Department of Psychology, Minnesota State University, Mankato
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Exercise Science Program, Southwest Minnesota State University
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**Alice Chan**
Heather Sklenicka (Faculty Mentor)
Chemistry, Rochester Community and Technical College
Determining common factors that influence academic success in Allied Health
Format: Oral

PRESENTATION #26

**Alexa Chouinard**
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**Gabrielle Cohrs**
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Format: Poster

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**Amber Dorr**
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Bemidji State University
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**Michael Doyle**
Kuldeep Agarwal (Faculty Mentor), Department of Automotive Manufacturing Technology, Minnesota State University, Mankato
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Format: Oral

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**Brianna Droubie and Kelly Douglas**
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Format: Poster
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Bemidji State University
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History & English, St Cloud State University
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Amber Godfrey
Heather Sklenicka (Faculty Mentor)
Chemistry, Rochester Community and Technical College
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David Higgins (Faculty Mentor)
English, Inver Hills Community College
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Department of Sociology, Winona State University
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Daniel Heerema
Heather Sklenicka (Faculty Mentor)
Chemistry, Rochester Community and Technical College
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Colin Helfenstein
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Minnesota State University Moorhead
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Format: Oral

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Samantha Holien
Timothy Secott (Faculty Mentor)
Department of Biology, Minnesota State University, Mankato
Classroom Prevalence of Methicillin Resistant Coagulase-Negative Staphylococcus Species Isolated Students
Format: Poster

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Tamara Berg (Faculty Mentor)
Women’s, Gender, & Sexuality Studies Program, Winona State University
The Precarity of Safety: Bystander Intervention Praxis as a Challenge to Systemic Violence on Campus
Format: Poster

PRESENTATION #55
Sarah Hopfner
Mark Mechelke (Faculty Mentor)
Chemistry and Biochemistry, St Cloud State University
Design and Synthesis of a Novel Indanone Chemotherapeutic Agent
Format: Poster

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Sean Hudson
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English, Inver Hills Community College
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Amy Runck (Faculty Mentor)
Biology Department, Winona State University
Seasonal hemoglobin gene expression in tiger salamanders (Ambystoma tigrinum)
Format: Poster

PRESENTATION #59
Shruti Jagannathan
Latha Ramakrishnan (Faculty Mentor)
Chemistry and Biochemistry, St Cloud State University
Analyzing the Pharmacological Effects of Picrotoxin in Regenerating and Intact Dugesia Tigrina (Planaria) Worms
Format: Poster

PRESENTATION #60
August Kammueller
David Higgins (Faculty Mentor)
English, Inver Hills Community College
A War on Two Fronts: Historic Competition Illustrated Through the Nissan GT-R and Chevrolet Corvette
Format: Oral

PRESENTATION #61
Sean Kelley
Joan Francioni (Faculty Mentor)
Department of Computer Science, Winona State University
Energy Use Implications of Responsive Design Websites on Mobile Devices
Format: Poster

PRESENTATION #62
Benjamin J. Keute
Stephen T. Allard (Faculty Mentor) Department of Geoscience, Winona State University
Passive Folding Model for Deformation of Nemo Group During Final Suturing of the Wyoming and Superior Province, NE Black Hills, South Dakota
Format: Poster

PRESENTATION #63
Jackson Kisling
Ryan Hankins (Faculty Mentor)
Department of Information and Computer Science, Metropolitan State University
RPG Grid Brawl: A Study of Artificial Intelligence Using a Board Game
Format: Oral
PRESENTATION #65

Kaylie Knipe
David Higgins (Faculty Mentor)
English, Inver Hills Community College
Better Than You: America’s Distaste for The Mentally Disabled
Format: Oral

PRESENTATION #66

Alex Koerber
Stephen T. Allard (Faculty Mentor) Department of Geoscience, Winona State University
Interpreting variably-oriented folds within the Nemo Shear Zone, northeast Black Hills, South Dakota
Format: Poster

PRESENTATION #67

Debra Koenig
David Higgins (Faculty Mentor)
Psychology, Inver Hills Community College
Why do people become bullies?
Format: Oral

PRESENTATION #68

Samantha Koshowany-Wilken
Maureen O’Brien and Glenn Davis (Faculty Mentor) History & English, St Cloud State University
St. Marina: A Lesson in Spiritual Endurance
Format: Oral

PRESENTATION #69

Lynda LaFond
Elizabeth Rave (Faculty Mentor)
Bemidji State University
Effects of Three Land Management Regimes on Small Mammal Abundance at Grand Forks Air Force Base, North Dakota
Format: Poster

PRESENTATION #70

Julia Lautizi and Trae Boldthen
Kevin Filter (Faculty Mentor), Department of Psychology Minnesota State University, Mankato
Subgroup Pro-Ana
Format: Oral

PRESENTATION #71

You Na Lee and Jaeyoung Son
Rachel Cohen (Faculty Mentor)
Department of Biology, Minnesota State University, Mankato
Effect of steroid hormones on neurogenesis in the brain of the green anole lizard.
Format: Poster

PRESENTATION #72

Benjamin Lencowski
David Higgins, Faculty Mentor
English, Inver Hills Community College
American Sniper and Self Loathing
Format: Oral

PRESENTATION #73

Hunter Ludwig and Tad Joel
Kuldeep Agarwal (Faculty Mentor)
Department of Automotive Engineering Technology, Minnesota State University, Mankato
Wear properties of 3D printed Stainless Steel-Bronze Composite
Format: Poster

PRESENTATION #74

Robert Mahrer
Gary Mead (Faculty Mentor)
Department of Automotive Engineering and Technology, Minnesota State University, Mankato
Uprights
Format: Oral

PRESENTATION #75

Brenda Martinson
Julie Kerr-Berry (Faculty Mentor)
Department of Dance, Minnesota State University, Mankato
The Communist and Democratic Influence on Russian Ballet: From the Soviet Union to Russia
Format: Oral

PRESENTATION #76

Alexis McCall
Daniel Moen (Faculty Mentor)
Department of Family Consumer Science Minnesota State University, Mankato
How Rural Families Cope when a Loved one is Diagnosed with an Eating Disorder
Format: Poster
PRESENTATION #77
Krista Migneault
David Higgins (Faculty Mentor)
English, Inver Hills Community College
Budget Surpluses of the 1990’s
Format: Oral

PRESENTATION #78
Linda McBrayer
Sumiko Otsubo (Faculty Mentor)
History Department, Metropolitan State University
Sex-selective abortion, eugenics, and embodied citizenship in post-independence India
Format: Oral

PRESENTATION #79
Angela Miller, Ashley Forman, Daniel Gitto and Alex Russell
Amanda M. Brouwer and John C. Johanson (Faculty Mentors)
Winona State University
“Are there things that we missed?”: A Qualitative Exploration of Experiences of Academic Achievement in Collegiate Athletes
Format: Poster

PRESENTATION #80
Abdiham A. Mohamoud, Mary Soderlund, Abigail Schraufnagel and Rachel Dahl
Osvaldo Martinez (Faculty Mentor)
Biology Department, Winona State University
Establishment of a system using THP-1 human monocytes to distinguish between myeloid differentiation primary response gene 88 dependent or independent pathogen associated molecular pattern signaling
Format: Poster

PRESENTATION #82
Rachel Munson
Larry Swain (Faculty Mentor)
Bemidji State University
The Boar-Image in Medieval Scandinavia
Format: Oral

PRESENTATION #83
Patricia Muras, Troy Salewske, Devan Solheid, Erica Stiller and Mai Nou Yang
Jana Craft (Faculty Mentor)
Business Administration, Winona State University
Non-Profits: Where Should We Donate our Dollars?
Format: Poster

PRESENTATION #84
Jennifer Nelson and Lauren Bennewitz
Kathy Bertsch (Faculty Mentor)
Department of Psychology, Minnesota State University, Mankato
Special Education Teacher Training and Knowledge of Behavior Assessment and Intervention Practices
Format: Oral

PRESENTATION #85
Christopher M. Nicosia
Stephen T. Allard (Faculty Mentor) Department of Geoscience, Winona State University
Petrologic and Geochemical Characterization of Archean Gneisses in the Little Elk Terrane, Black Hills, South Dakota
Format: Poster

PRESENTATION #86
Judith Oochukwu
Amanda M. Brouwer (Faculty Mentor)
Winona State University
The Role of Resiliency in Stress and Coping Styles
Format: Poster

PRESENTATION #87
Kyle Olsen
David Higgins (Faculty Mentor)
English, Inver Hills Community College
Children as Monsters are the Products of Society
Format: Oral

PRESENTATION #88
Alix M. Overgard
Thomas W. Nalli (Faculty Mentor) Department of Chemistry, Winona State University
GC-MS Analysis of Phytosterol Content of Dried Mushrooms
Format: Poster

PRESENTATION #89
Gilbert Penaherrera
Derek Webb (Faculty Mentor)
Bemidji State University
Pursuing the Saddle Point: Social Science vs. Natural Sciences
Format: Oral
PRESENTATION #90
Kira Perez  
Jennifer L. Schultz (Faculty Mentor)  
College of Management, Human Resource Management, Metropolitan State University  
Music in the Workplace  
Format: Poster

PRESENTATION #91  
Daniel Perno  
Lori Halverson-Wente (Faculty Mentor) Department of Communication, Rochester Community and Technical College  
Intercultural Communication, Service Learning, and the Study of Poverty Abroad  
Format: Oral

PRESENTATION #92  
Anh Pham  
Dorothy Wrigley (Faculty Mentor)  
Department of Biology, Minnesota State University, Mankato  
Survival of Verminephrobacter in amputated worm tails  
Format: Poster

PRESENTATION #93  
Angelina Pirozzoli and Madeline Podgorak  
Maureen Gerson and Amy Reitmaier Koehler (Faculty Mentors)  
Department of Nursing, Winona State University, Winona  
Palliative Care Knowledge and Self-Efficacy within a Baccalaureate Nursing Program: Phase 2  
Format: Poster

PRESENTATION #94  
Allison Rasmussen, Anthony Alexander and Meagan Schroeder  
Rafael Narvaez (Faculty Mentor)  
Department of Sociology, Winona State University  
Media Usage and Learning Outcomes among Sociology Students  
Format: Poster

PRESENTATION #95  
Austin Rau  
Cynthia Miller (Faculty Mentor)  
Department of Geography, Minnesota State University, Mankato  
Minnesota and the Logistics of Bakken Crude Oil  
Format: Poster

PRESENTATION #96  
Jessica Reich  
Alisa Eimen (Faculty Mentor)  
Department of Art, Minnesota State University, Mankato  
Monstrosity from the Medieval to the Renaissance  
Format: Oral

PRESENTATION #97  
Samantha Ritter  
Frank Schindler (Faculty Mentor)  
Chemistry Program  
Emily Deaver & Thomas Dilley (Faculty Mentors) Environmental Science Program  
Southwest Minnesota State University  
Evaluation of the intrinsic surface charge of a layered silicate soil  
Format: Poster

PRESENTATION #98  
Allison Rogich  
Heather Sklenicka (Faculty Mentor)  
Chemistry, Rochester Community and Technical College  
Exploration and Analysis of Lipid Content in Canine Food  
Format: Poster

PRESENTATION #99  
Marten Salfer  
Marianne Zarzana (Faculty Mentor)  
Creative Writing Program, English Department, Southwest Minnesota State University  
A Fantasy Farmer  
Format: Oral

PRESENTATION #100  
Kaley Scearcy and Megan Evert  
Jeffrey W. Bell (Faculty Mentor)  
Exercise Science Program, Southwest Minnesota State University  
Functional Movement Screening in Active and Sedentary Men and Women  
Format: Poster

PRESENTATION #101  
Johannah Scheu  
Elizabeth Kirchoff (Faculty Mentor)  
Minnesota State University Moorhead  
Student Ratings of Female Professors with Foreign-Accented Speech at Minnesota State University Moorhead  
Format: Oral
PRESENTATION #102

Dustin Schulte
Jeffrey W. Bell (Faculty Mentor)
Exercise Science Program, Southwest Minnesota State University
Differences in Health and Skill Related Physical Measurements Between Forwards and Backs on the SMSU Men's Rugby Team
Format: Poster

PRESENTATION #103

Ashley T. Shuck, Elizabeth C. Daniels, Alix M. Overgard and Reid L. Hein
Myoung Lee (Faculty Mentor)
Department of Chemistry, Winona State University
Effect of Antidiabetic Agent Metformin and its Structural Analogs on the in vitro Glycation of Bovine Serum Albumin
Format: Poster

PRESENTATION #104

Farhiya Soldad
David Higgins (Faculty Mentor)
English, Inver Hills Community College
Who do we blame for genocidal hatred?
Format: Oral

PRESENTATION #105

Sheryl I. Stephenson
Stephen Allard (Faculty Mentor)
Department of Geoscience, Winona State University
Investigating Shear-heating Model for Leucogranite Generation within Archean Basement, Black Hills, South Dakota
Format: Poster

PRESENTATION #106

Nathan Stott
Andrew Hafs (Faculty Mentor)
Bemidji State University
Migration and Size Variance of Larval Northern Pike (Esox lucius) in the Tamarack River
Format: Oral

PRESENTATION #107

Olaf Summers and Briana Bruske
Heather Sklenicka (Faculty Mentor)
Chemistry, Rochester Community and Technical College
Toward a comprehensive integration of calorimetry across the curriculum
Format: Poster

PRESENTATION #109

Elisabeth Teige and Angela Kooren,
Donna Stockrahm (Faculty Mentor)
Minnesota State University Moorhead
Urban Turkeys: Use of a Random, Stratified Survey of Homeowners in the Fargo (ND)-Moorhead (MN) Area to Estimate Turkey Distributions and Numbers, Human-Turkey Interactions, and Public Opinion on Turkeys
Format: Poster

PRESENTATION #112

Julie Velasquez
David Higgins (Faculty Mentor)
English, Inver Hills Community College
Money and Social Class in Titanic and The Purge
Format: Oral

PRESENTATION #113

Amanda Weiss and Melissa Kohout
Maija Sipola (Faculty Mentor)
Department of Geology, Minnesota State University, Mankato
XRF Geochemical Analysis of the Ngandong Paleoanthropological Site in Java, Indonesia
Format: Poster

PRESENTATION #114

William White and Dominic Tunison
Kuldeep Agarwal and Winston Sealy (Faculty Mentors)
Department of Manufacturing Engineering Technology, Minnesota State University, Mankato
Low Cost Welding based Metal 3d Printer
Format: Poster

PRESENTATION #115

Jessica Wiswell and Nicole Thompson
Kevin Filter (Faculty Mentor)
Department of Psychology, Minnesota State University, Mankato
Comparing the Reliability and Sensitivity of Observational Systems for Positive Behavior
Format: Oral

PRESENTATION #116

Jane White
Jill Stackhouse (Faculty Mentor)
Bemidji State University
Labor Exploitation in Juarez, Mexico: Gender Issues in the Maquiladoras
Format: Oral
PRESENTATION #117
John Zehnder
Megan Mahowald (Faculty Mentor)
Department of Communication Disorders
Minnesota State University, Mankato
Literate Language Features in the Procedural Narratives of African-American and European-American 5th Graders
Format: Oral

PRESENTATION #118
John Zehnder
Adriana Gordillo (Faculty Mentor) Department of World Languages
Minnesota State University, Mankato
The Garden of Forking Opinions: Lugones and Borges on Science
Format: Oral

PRESENTATION #119
Douglas Zentner
Andrew Hafs (Faculty Member)
Bemidji State University
A Genetic Based Approach to Management and Stocking of Muskellunge
Format: Oral

PRESENTATION #120
Pengyu Qian
Eduardo Pablo (Faculty Mentor)
Minnesota State University Moorhead
Country Risk and its Effects on Institutional Investment Fund Flows: Evidence from Mexico
Format: Poster

PRESENTATION #121
Pratik Dahal
Damiano Fulghesu (Faculty Mentor)
Minnesota State University Moorhead
The Isoperimetric Inequality
Format: Oral

PRESENTATION #122
Tianxia Jia
Joyati Debnath (Faculty Mentor)
Winona State University
Visualizing Elementary Complex Functions
Format: Oral

PRESENTATION #123
Jaden Witt
Ellen Brisch, Shawn Garrett and Patricia Wisenden (Faculty Mentors)
Minnesota State University Moorhead
Xenopus Embryo Development upon Exposure to Downstream Water from an Effluent Plant
Format: Oral
The amount of solar energy that falls on the earth’s surface in one minute equals the total annual energy consumption of the entire world’s people. The question is how we can harvest the energy efficiently. Photovoltaic or solar cells one of the few ways to harvest this energy. The main objective of this paper is to discover factors that determine the number of photovoltaic panel installation per million people in the US and build a regression model to quantify their effect. Ten independent variables were studied and their effect was quantified. The results of this analysis shows that all the coefficients related to the independent variables has a coefficient that is expected in alternative hypothesis. In addition, Different statistical hypothesis tests were performed on the model to check its validity and the result are presented.

Carbon dioxide emitted from burning fossil fuels is creating the huge problem of climate change. Renewable energy sources are one of the ways to tackle this challenge, and the sun is the most powerful energy source. The amount of solar energy that falls on the earth’s surface in 40 minutes equals the total annual energy consumption of the entire world’s people. Semiconductor solar cells are simply semiconductor diodes that have been carefully designed and constructed to efficiently absorb and convert light energy from the sun into electrical energy. A complete description of the operation of solar cells devices can be obtained by solving the set of semiconductor device equations. In this work, a Python code was developed to solve these equations numerically for one-dimensional Gallium Arsenide (GaAs) homojunction devices. Based on the solutions, the working principle of solar cell devices were understood and ways to optimize the device performance were suggested.

Because most easily-found oil has already been exploited, new prospects typically lie in complex and challenging geologic formations. Therefore, sophisticated basin and petroleum system modeling continues to grow in popularity because it provides an integrative exploration tool, which can be used to quantify many of the key aspects of an evolving basin and active petroleum systems within it. The Williston Basin in North Dakota has become a prolific petroleum province. Currently, hydraulic fracturing of “tight” Bakken shale allows enhancement of production, but still much oil remains in the rock. Typically we have been successful in getting 30% of total recoverable hydrocarbons, therefore much need to be done to improve production efficiency. This research focuses on modeling (using Platte River Associates’ Basin MOD) of petroleum generation and fluid overpressure development in the Williston Basin, using data such as source rock thickness and TOC, kerogen type, petroleum attributes (API gravity, maturity and volume), and burial/thermal history (stratigraphic column, ages of units, any heat flow or heat production data). By comparing the modeled amount of oil generated in the rock with actual total amounts produced from wells, we estimate the percent of oil that remains in the rock after the well is no longer in production. We also evaluate the source of “excess” fluid pressure in the Bakken shale. These data can be useful in developing more-efficient oil production strategies.

The Dirichlet problem is interesting in the fact that the value of the steady-state temperature is prescribed at each point along the boundary of a plate. A familiar equation, Laplace’s Equation, is also a consequence of the Dirichlet problem that is directly related to the fields of Thermodynamics, Hydrostatics and Gravitation. The Dirichlet problem concerning the annulus makes it so that the Laplace Equation is satisfied in the domain and that for all points on the boundary. The Dirichlet problem also focuses on solving the temperature of the domain, and the heat flux of the domain to form into the complex potential function:

\[ \nabla \phi = \frac{\partial^2 \phi}{\partial x^2} + \frac{\partial^2 \phi}{\partial y^2} = 0 \]

\[ \phi(r, \theta) = \frac{A}{r} + \sum_{n=1}^{\infty} B_n \left( \frac{\sin(n \theta)}{n} \right) \]

\[ \frac{\partial \phi}{\partial n} = 0 \] at the boundary of the annulus.
Sometimes there are not nice curves for problems concerning Dirichlet problems. One example of this are finite boundary circular curves of the annulus. In this presentation we shall go over some surprising results of the Dirichlet problem of the annulus and go over some methods which I have created to extrapolate data from the problem of the Annulus.

PRESENTATION #5

Chris Ampe, Garrett Conn, Brad Gillingham and Brittney Anderson

Jeffrey W. Bell (Faculty Mentor)

Exercise Science Program, Southwest Minnesota State University

The Effects of Teleoanticipation on Power in Powerlifters

Format: Poster

Teleoanticipation theory suggests athletes predetermine intensity and pace based off various cues before exercise onset. Teleoanticipation has been previously tested with cycling and running events, but not with weightlifting. This study sought to determine how teleoanticipation affects average power and average velocity during bench press of powerlifters. Seven powerlifters, all within 90th percentile of their 1 RM based on age norms and weight, were tested. Subjects were randomized to perform either short or long after control. Using a Tendo Power Analyzer Unit, subjects performed 3 sets of repetitions (6, 10, and 14) at 70% of 1 RM with perception of performing 10, but 2 sets suddenly increased/decreased. It was found that a decrease in power was attributed to a decrease in limb speed. No endspurt was detected in control nor short set; there appeared to be an endspurt in long set, but no significant differences were found in power (sig=.538) or velocity between control and long set (sig=.607). Average power control (PC) was 3.441 watts higher in control compared to average power long (PL) (sig=.018), average power short (PS) was 5.627 watts lower than average PL (sig=.002), average velocity control (VC) was 3.506 watts higher than average velocity short (VS) (sig=.017), and average VS was 5.494 watts lower than average velocity long (VL) (sig=.003). There were no significant differences between average PC and average PL nor average VC and average VL. In conclusion, testing at 70% of IRM may be too high to see effects of teleoanticipation and endspurt in bench press.

PRESENTATION #6

Rayne Anderson

David Higgins (Faculty Mentor)

English, Inver Hills Community College

Biblical Influences on MLK’s “I Have a Dream” Speech

Format: Oral

For my research project, I have chosen to examine Martin Luther King’s “I Have a Dream” speech. “I Have a Dream” was delivered on August 28, 1963 on Lincoln Memorial in Washington. My project delves into the particular American hopes and fears reflected in “I Have a Dream”. In order to thoroughly probe these cultural hopes and fears I have done a literary analysis of the hopes and fears in that given time. I also used secondary research from scholarly sources. I used these secondary scholarly sources to dig deeper into the cultural hopes and fears of my primary source. In my research I have found plenty of useful information regarding my primary source. All of my sources were found on Academic Search Premier which is a database of scholarly journals. For example, one of my sources is from the Yale Law Journal. Based on my literary analysis of the primary source and the scholarly sources, my research has led me to believe that this text shows that Americans are afraid of inequality and of our government not keeping their promises to us. At the same time, Americans are also hopeful for a time when all people, young and old, black and white, all the brothers and sisters alike can join hands and be one. We dream of a time when there is no “white” drinking fountains or “colored” bathrooms, a time where we all share the same ground and are treated equally. What I mean by this is a big part of Martin Luther King’s “I Have a Dream” draws on the fact that our government did not keep the promise it made in the Declaration of Independence. Our government made a promise to its people from the beginning that “all men are created equal” and that we are all “granted certain unalienable rights”. Yet a couple hundred years later there is still no equality. This research is important because it makes a point of reminding us that not only is segregation unlawful and unjust according to the Declaration of Independence, it is also morally wrong according to the Bible. I feel like when kids in school study this speech something that is often over looked is how Biblical it is. Martin Luther King, Jr. makes comparisons between Moses leading the Israelites out of Egypt and into the promise land to himself leading African Americans to a place of equality. This research is also important for the obvious reason that without Martin Luther King Jr. delivering this monumental speech our world would not be how it is today. In the beginning of “I Have a Dream” King states that this speech “will go down in history as the greatest demonstration for freedom in the history of our nation.” And the speech now lives on in much-publicized honor.
**PRESENTATION #7**

**Claire Arvidson and Courtney Swanson**
Amanda M. Brouwer (Faculty Mentor)
Winona State University

“I am a gym-goer”: Self-as-Doer Identity Predicts Physical Activity Behaviors
Format: Poster

Self-determinism, intrinsic motivation, and identity predict whether an individual will exercise. However, research exploring how self-determinism and identity together predict exercise is limited. Therefore, the current study explores how a motivational identity construct, the self-doers identity (e.g., the identification of one as the doer of a particular action) might influence exercise and if it predicts exercise more than self-determinism. Furthermore, the self-doers identity has been related to diet behaviors, but it has yet to be studied in physical activity behaviors. Data was collected from 118 participants ($M_{age}=20.07; SD=2.63$). Participants took a survey online and participated in a short writing activity assessing their self-as-doer identities related to physical activity. Height and weight was also recorded. Data were analyzed using a hierarchical multiple regression. Self-as-doer identity accounted for an additional 3.4% of variance within the model $\Delta R^2=.034, F(1,103)=4.46, p=.04$. Identified motivation ($b=11.84, t(103)=2.16, p=.033$) and self-as-doer identity ($b=7.48, t(103)=2.11, p=.037$) were significant individual contributors to exercise behaviors. In addition to existing motivation theories such as the self-determinism theory, self-as-doer identity has a significant effect on individuals’ exercise regimes. People who identify more with identities associated with exercise (e.g. “gym goer”, “stairs taker”, “biker”) were more likely to carry out the corresponding behaviors, over and above their identified motivation. Results suggest that helping clients see themselves as exercisers may be likely to influence more exercise behavior. Future research might explore the causal effects of developing doer identities on physical activity enactment.

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**PRESENTATION #8**

**Taysir Bader and Kshitij Gurung**
Gary Edvenson (Faculty Mentor)
Minnesota State University Moorhead

Reaction of 1-{2-[diphenylboryl]benzyl}-2,2,6,6-tetramethylpiperidine with hydrogen
Format: Poster

Frustrated Lewis Pairs (FLPs) have been shown to be able to activate small molecules such as H2. Building on last year’s reported synthesis of the new intramolecular FLP 1-{2-[diphenylboryl]benzyl}-2,2,6,6-tetramethylpiperidine, the result of its purification and reaction with hydrogen will be reported.

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**PRESENTATION #9**

**Jeremy Baert**
Sumiko Otsubo (Faculty Mentor)
History Department, Metropolitan State University

A Look at the Kent State Incident Through Event, Experience and Myth
Format: Oral

This is an essay that takes its queue from Paul A. Cohen’s book History in Three Keys: The Boxers as Event, Experience, and Myth, and applies Cohen’s method to the events of Kent State University on May 4, 1970. As Cohen’s title suggests, he explores the Chinese Boxer Rebellion in three distinct sections, giving each section a distinctive perspective; event, experience and myth. This essay is similarly formatted, but with a different subject matter; the Kent State Incident. In the first section I attempt to summarily recount the events of Kent, Ohio as one might traditionally expect an historical event to be presented. The second section is a synopsis of how people that were present at the time that the shooting occurred recounted their experience, thoughts and feelings. And finally, in the third section I examine myth, or in other words, the way that the event is perceived and how that perception has changed over time; particularly how in the subsequent years a belief that the shooting led to the end of United States military action in Vietnam. My research was drawn from various sources that included government reports, academic analysis, witness interviews, online comments, national polls and others. By approaching the topic from three different perspectives and drawing from a diverse cadre of sources, I hope to give a concise summary of the events, share a glimpse what people that were there experienced and raise some questions as to its lasting effects and meaning.

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**PRESENTATION #10**

**Aida Bamutye**
Richard Jewell (Faculty Mentor)
English, Inver Hills Community College

Female Circumcision: Mixed Emotions
Format: Oral

My research project is titled Female Circumcision: Mixed Emotions. This paper visits the worldwide issue of female circumcision and how different people have different views and feelings about it. It is a dialogic paper and I use three different groups of people to argue their views on female circumcision. I use the Traditionalists, the human rights activists, and those in the middle. The traditionalists argue that female circumcision is the demands of tradition. The human rights activists argue that this is simply barbaric and unacceptable especially when it is performed of minors. While those in the middle argue that no matter how traumatic or disastrous this may seem, some traditions just need to be left alone. The central findings of this research is that female circumcision is all over the world and...
people need to be educated about it. This research is important because it sheds light on an issue that not so many people know about.

PRESENTATION #12
Antwan Battles, Erin Hoffmann, Grant Ignatius, Braydon Koball, Ben Larson, Mitchell Pitek, Alyssa Riles and Zoe Waite
Jana Craft (Faculty Mentor)
Business Administration, Winona State University
*Code of ethics and corporate culture within collegiate and professional sports*
Format: Poster

Using a two-pronged approach, this study investigates the ethical standards, codes of ethics and ethical corporate culture within both collegiate and professional sports. Both industries have been plagued with scandal which caused us to question their ethics. Do both organizations have weak ethical underpinnings? Using a qualitative research design, we investigate the legitimacy of the National Collegiate Athletic Association’s (NCAA) mission that claims to be focused on the student before the athlete. We further examine the National Basketball Association’s (NBA) code of ethics and corporate culture. Data was collected via personal and electronic interviews, electronic correspondence and document analysis. Within the NCAA, our investigation prompted results in several themes including core values, ethical standards and ethical culture. Further, we found that the NBA establishes a standard for behaviors regarding ethical responsibilities, ethical training and ethical culture, which is contrary to their public image. Narrative responses, student discoveries, and suggestions for future research are included.

PRESENTATION #13
Josh Beatty, Erik Borrman, William Griesbach, Brandon Hutkowski, Tyler Kiel, Kathy Moening, Thomas Mohwinkel, Alex Nysven, Blake Olsen, Matt Pechnik, Tyler Peickert, Josh Prondzinski, Kyle Randall, Alex Tschida and Ben Williams
Jana Craft (Faculty Mentor)
Business Administration, Winona State University
*Frac Sand Mining: An Investigation of Water Use, Air Quality, and Waste Management from a Business Ethics Perspective*
Format: Poster

Frac sand mining is an area of contention with strong stances both for and against. This study investigates the ethicity of sand extraction concerning air quality, water consumption, and waste management of the mines in western Wisconsin and southeast Minnesota. This study examines the aforementioned concerns through a qualitative research design utilizing interviews, questionnaires and document analysis. Data was collected from numerous industry insiders and government professionals. We found clear adherence to legal standards and general compliance with permits; however, stakeholders find themselves unsatisfied with merely adhering to the legal standards and seek more accountability regarding the mines’ total impact on surrounding areas. This information is further reinforced through narrative responses, major discoveries for each of the primary mining focuses, as well as suggestions for future research.

PRESENTATION #14
Ryan Berres
Amanda M. Brouwer (Faculty Mentor)
Winona State University
*Self-as-Doer Identity and Exercise Activities: A Qualitative Analysis*
Format: Poster

The self-as-doer is a motivational identity, developed by adding the “er” suffix to behavioral goal statements, which promotes seeing oneself as the “doer” of one’s behavior. This identity has been associated with improved health behaviors in diabetic individuals, yet has not been studied related to exercise activities in healthy populations. Therefore, the present study explored the creation of exercise goals and corresponding self-as-doer identities among healthy young adults. After reading a handout about exercise recommendations, participants (N=123; Mage =20.07, SD=2.63) listed six exercise goals which they then translated into self-as-doer identities. Open-ended self-as-doer responses were then analyzed. Eight themes emerged based on doer phrases related to the type and context of the activity. Participants created doer identities related to cardio activity (e.g., runner) and group exercise activities with subthemes of “sports/club” and “instructor led activities.” Other identities included “general physical activity doers,” “strength trainers,” “everyday activity doers,” “flexibility,” “doing activities outside the gym” and “other health-related activities” (e.g., “sleeper” and “water drinker”). Themes most commonly represented were “other health-related activities,” and “cardio.” Participants created various exercise and health-related activities self-as-doer identities. Individuals often thought broadly about exercise, including behaviors related to physical health (e.g., diet, sleep). Participants either specified or vaguely indicated physical activities. Therefore future research might explore if degree of specificity influences actual behavioral enactment when using a self-as-doer identity. Findings could assist health professionals by having clients develop identities related to the “cardio” or “other-health related” themes in order to promote health behavior enactment.
J.R.R. Tolkien claims he did not get his characters, plot points and languages from any outside sources. Readers should not search through his novels with a proverbial fine-tooth comb for the seeds of his inspiration. However, if the reader were to commit such heresy, and cross-reference Tolkien’s novels The Lord of the Rings trilogy, The Hobbit and The Silmarillion with the ancient heroic epics Tolkien was known to be well-versed in; one can see clear parallels. Due to the fact Middle-Earth is a fictional world created by Tolkien, readers have no choice other than to place everything they read into a fictional category; nevertheless, this idea would be changed if readers knew the name: Middle-Earth, the origin of the name came from Norse mythology, or how Bilbo’s stealing of the cup from Smaug’s lair sounds similar to the theft of a cup from a different dragon’s cave in the Germanic epic, Beowulf. This paper will examine Tolkien’s most popular works for their points of origin in the ancient literary world. This will be an expansion of the works done by other Tolkien enthusiasts, proving that Tolkien, through his methodology, was influenced by exact sources outside his own imagination.

This research provides an analysis of high PT jets for the ATLAS tile calorimeter (TileCal) and liquid argon calorimeter (LArCal) for the Large Hadron Collider. These studies focus on jets with transverse momentum > 650 GeV to better understand how well these calorimeters will perform when the LHC is upgraded for run II experiments at 14 TeV collision energy scheduled for spring 2015. Using Monte Carlo (MC) simulation, the energy deposition of the calorimeters was investigated for jet PT up to 3000 GeV. It was found that a higher fraction of the total jet energy is deposited in TileCal as jet PT is increased whereas energy deposited in LArCal is decreasing slightly. In addition, it was found that energy begins to be deposited deeper into TileCal (BC and D layers) in high PT jet events. Also, jet energy tends to be deposited more centrally in the barrel region as PT increases, meaning the extended barrel calorimeters will see very few, if any, very high PT jets. This makes the performance of TileCal in the barrel region of paramount importance when studying very high PT jets in run II.

Abstract: The state of Minnesota is currently undergoing a dramatic change to the Child Maltreatment law after multiple gaps of the Child Protection system surfaced to the public’s attention. Governor Mark Dayton has assigned a Task Force to take on the lead of providing legislators with changes necessary to create a more sustainable Child Welfare system that will work more effectively in how each county of Minnesota will be able to screen in and out cases of child abuse and neglect as well as programs and practices available for families in the child protection system. Students of Metropolitan State University, receiving the Title IV-E Child Welfare Scholarship will research considerations that the committees of the Governor’s Task Force on Child Welfare has indicated as possible practices to prevent Child Abuse and Neglect within specific communities of color. Title IV-E scholar’s research entails the use of cultural helpers and evidence based practices for African American families, through the approach of exploratory research.

Nearly 1,000 painted turtles (Chrysemys picta bellii) have been live-trapped during our long-term study in Clay County, Minnesota, to study growth rates, survival, population characteristics, and movements. Captured turtles were weighed, sexed, measured, marked by scute notches (and PIT tags starting in 2006), and released on the shoreline of the slough of capture. From 2001-2010, we live-trapped 2 sloughs that were 1 km apart and roughly 3 ha and 6 ha in size. From 2011-2014, a third slough (0.4 ha) was trapped approximately halfway between the 2 original sloughs. Since 2007, turtle capture rates have declined, possibly due to changes in water depth and/or land use or behavioral differences as turtles learned to escape traps. Our purpose here is to examine capture rates yearly from 2001-2014 over the course of our trapping seasons (usually mid-May to mid-Sept) to determine if this has varied year-to-
year or by sex and to make future adjustments in our trapping schemes. After analyzing over 4,000 captures, June most often had the highest capture rate (including recaptures) for both adult males and females. July sometimes had the highest rate or was very close to that of June. In 2001 and 2006, total captures (including recaptures) were very high, over 500 and nearly 700, respectively. Captures for 2001 were very high for all months from June-August, and, in 2006, captures were high for all months May-August. Juvenile captures were spread more evenly over the months, indicating peaks for adults in June/July were probably associated with breeding season.

PRESENTATION #20
Nyabang Buom, Rita Fonder and Mark Jankowski
Scott Peterson (Faculty Mentor)
Psychology Program, Southwest Minnesota State University
Detecting emotional expressions with missing features
Format: Poster

The communication of emotions through facial expression has been a topic of interest to researchers for well over a century (Darwin, 1872). Identification of facial expressions is a highly adaptive function that involves complex processing and recalling of previously seen faces. It is used in the context of social interaction and helps determine what behavioral actions are to be initiated. Wilson and co-workers (2007) found that both autistic and non-autistic children tend to process unfamiliar faces using inner face parts rather than outer face parts. However, the relative importance of these inner face parts (eyes, eyebrows, nose, and mouth) has been debated among researchers, especially as it applies to emotional facial expressions. Using a computer-based visual search procedure adopted from Calvo and Marrero (2009), we measured how quickly and accurately participants could detect faces with missing features when displayed within scenes containing normal faces (no missing features). As a follow-up to a prior experiment that used faces with neutral expressions, the present experiment includes faces with happy and angry expressions. Data for the happy and angry faces are examined to determine the relative importance of the upper and lower parts of the face in processing these emotional expressions, and to determine how the processing of emotional faces differs from those with neutral expressions. Results of this experiment will help us better understand how emotions affect face recognition.

PRESENTATION #21
Kyle Burgess and Kourtney Mitchell
Karla Lassonde (Faculty Mentor)
Department of Psychology, Minnesota State University, Mankato
Can Student Attention Predict Learning? Investigating the Relationship between Sustained Attention and the Testing Effect
Format: Oral

Attention and memory are essential for academic success; however, there are many classroom circumstances in which it is clear that students have difficulty paying attention. Our goal was to examine the role of sustained attention on memory for test items. Research on testing has revealed the Testing Effect phenomenon, which has shown positive effects on long-term retention through repeated-testing. We examined whether or not an individual’s ability to sustain attention would influence these known benefits. The Sustained Attention to Response Task (SART; a go/ no-go task) was utilized to measure participants’ ability to pay attention. Participants were randomly assigned into one of three conditions: testing condition with self-study (study condition), testing condition with multiple quizzes (testing condition), or control condition. In each of the testing conditions, the video was divided into four equal parts. After each segment, the study condition was provided with a review of presented material whereas the test condition received a five-question quiz. In the control condition, participants watched the complete lecture without interruption. All conditions then completed a five minute distractor task (word search) before a 20 multiple-choice question cumulative exam. All final exam scores were divided into high and low attainers based on SART errors. Preliminary analysis of mean final exam scores revealed the present study failed to elicit the Testing Effect. No significant differences were found between all conditions or when split based on attention. Degree of difficulty was considered causal for observed results, therefore future research must use more complex material.
PRESENTATION #22

Oksana Carlier (Faculty Mentor)
Kara Lindaman (Faculty Mentor)
Department of Political Science, Winona State University
*WSU Students’ Opinions and Habits on Organic Food*
Format: Poster

Young people may believe in the principles behind eating nutritiously but do not always follow through with their actions (Hartman Group, 1996). The goal of this study is to collect data on college students’ opinions and habits regarding organic food. Winona State University student participants will be asked to answer survey questions related to their views on and consumption of organic food. The study will test the hypothesis that college students say one thing but do another in regards to organic food consumption. Using a convenience survey, 100 WSU students will be surveyed. Various results are expected from the study. First, females from the upper class who ate organic food as children are expected to eat more organic food than males in lower classes that did not eat organic food as children. Second, it is expected that many college students care about environmental issues but do not eat organic food. The findings from the study could lend local farms and food co-ops the opportunity to better inform their customers about organic food.

PRESENTATION #23

Annette T. Carr (Faculty Mentor)
Jeffrey W. Bell (Faculty Mentor)
Exercise Science Program, Southwest Minnesota State University
*Case Study: Ankle-brachial index in Postural Orthostatic Tachycardia Syndrome (POTS)*
Format: Poster

This study was conducted to determine effects of acute exercise on heart-rate and blood pressure in a case subject (CS) who has been diagnosed with Postural Orthostatic Tachycardia Syndrome (POTS). Due to the altered sympathetic nervous system function, heart-rate and blood-pressure responses were measured before and after upper-body and lower-body exercise. Twelve similarly aged controls (CON) were studied for comparison. Clinical criteria for POTS include sustained heart-rate increase of ≥ 30 beats per minute within 10 minutes of standing. After 5 minutes of standing, CS heart-rate increased from 83 to 114 bpm whereas CON heart rate increased from 75.83±12.15 to 90.58±10.48. Resting ankle-brachial index (ABI) in POTS compared to CON was lower (0.94 vs 1.08±0.08). Post-arm cycling ABI was higher (1.27 vs. 1.04±0.10) as was post-leg cycling (1.25 vs. 0.98±0.10). Therefore, acute exercise can increase ABI when sympathetic nervous function is compromised, but may decrease ABI when sympathetics function properly.

PRESENTATION #24

Raul Cervantes (Faculty Mentor)
David Higgins (Faculty Mentor)
English, Inver Hills Community College
*American Hopes and Fears in The 100*
Format: Oral

The fear of threat to life, liberty and equality are the most important points in The 100 - a popular contemporary science fiction television show. The show approaches the hopes of stability, peace, and balance between human beings and nature. Although the story takes place in a futurist period, the characteristics of setting are a reminder of the World War II, which invokes traditional American historical fears and hopes. In order to explore these cultural hopes and fears I have analyzed the plot along with the historical and social context which motivates and influences the scenario, the characters and their features. The TV show started in a period after the Arab Spring revolutionary movement which spread to Arabic countries. Resulting from this influence, the story shows a sort of government with authoritarians and dictatorial characteristics. However, the story reveals this constant reference of the anarchist ideas of liberty that can be compared to the rebellions citizens in the revolution against the dictatorial governments on the Arabic countries. Another factor which influenced the story of the TV show was the threat of the production of nuclear weapons by Iran. This has aggravated the already existing fear of nuclear war. The entire world, and Americans in particular, are afraid of World War III. Additionally, this TV show is all about a fight for gender equality and an acceptance of sexual and ethnic differences. This research is important because it enables us to analyze historical and current fears. This complicated balance is clear when we analyze the fear of nuclear war which is present since the use of nuclear power and recently accentuated by the threat of the nuclear weapons productions on Iran. But, also the hope of equality between genders what already should be a reality in the society. The equality of genders is still a big challenge once there is a large discrepancy in job opportunities and the wage differential between men and women.
What are the factors that promote academic success in studying Allied Health Chemistry (CHEM 1117 General, Organic and Biological Chemistry I)? The connection between best practices by students outside the classroom and measures of academic success during a semester in CHEM 1117 were examined. Understanding the link between what measures successful students undertook will provide a core foundation for continued and/or improved academic performance for current and future students in Allied Health Chemistry. Undergraduate students in a CHEM 1117 course were surveyed about their use of available course resources over three different semesters at a public community college. Their responses were statistically measured and analyzed. The data collected was examined in an attempt to predict if a high GPA in Chemistry correlated with available resources and student self-assessment of which resources they found most and least helpful. The most commonly used resources were measured against unit exam and final course grades to determine if there was a correlation between these factors and success on assessments. The resources measured include (i) course materials (ii) instructor accessibility, (iii) self or assisted tutoring and (iv) technology. Preliminary results indicate that attending class lectures and doing competency assessments favor successful academic performance. Analysis could provide a more definitive conclusion to whether the productive use of available resources will ensure successful academic performance in Allied Health Chemistry. This work will lead to tools for future students to guide their choices of resources as the list of available resources continues to expand.

A Study of the Correlation between Traumatic Experiences and Movement Memory
Format: Oral

Trauma can disrupt one’s life causing isolation, anxiety, physical illness, and sometimes a complete loss of identity. Traumatic experiences live within our bodies and the challenge of overcoming these traumas is to heal the mind and soul, as well as the body. One way of beginning the healing process is through the use of movement. This paper explores how the use of dance movement is instilled within the acknowledgment that the body and mind are inseparable. Connecting this idea to choreographers, like Jose Limon and Pearl Primus, who created works after experiencing significant life traumas, provides insight into how art can reflect horrific life traumas and offer healing to both the choreographer and the viewer.
Gabrielle Cohrs
Marianne Zarzana (Faculty Mentor)
Creative Writing Program, English Department, Southwest Minnesota State University
*Dämmerschlaf: A Time of Twilight and of Sleep*
Format: Oral

I’ve become fascinated by ordinary life. I use fiction as a way to persuade my readers to be more empathetic to the world around them. Good fiction opens the mind and causes movements that society might not be ready for but desperately needs. I see my writing as a way to accomplish such a shift. Often, I pull from my world, such as personal experiences or issues that have been cast aside for lack of worth. Crafting my own brand of simple realism, I enjoy compelling readers to access all corners of the soul. Humanity is a fascinating story that needs to be mapped. My work offers a critical view of the issues society too often refuses to face.

Ryan Colakovic
Brian Groh (Faculty Mentor)
Department of Chemistry, Minnesota State University, Mankato
*Esterification of Acid Chlorides*
Format: Poster

Esters are chemical compounds that are commonly derived from a carboxylic acid and an alcohol. Many are used as fragrances as they give off sweet-smelling aromas such as fruits, caramel, and rum. Esters were synthesized through refluxing a carboxylic acid derivative and an alcohol in an imidazole-buffered environment. The presence of imidazole will maintain the pH by absorbing any acid produced. The carboxylic acid derivative was initially an acid anhydride but later switched to an acid chloride to yield purer esters. The products were purified through acid-base extraction and vapor distillation. The esters produced were analyzed by infrared (IR) spectroscopy, gas chromatography (GC), and nuclear magnetic resonance (NMR). An esterification procedure was developed to be completed in two hours for use in an organic chemistry lab. Students will choose an unknown combination of an acid chloride and an alcohol to produce an ester. After obtaining spectroscopic data to determine the structure of the ester, students will determine their unknowns.

Mikeal Cooper
Emily Deaver (Faculty Mentor)
Environmental Science Program, Southwest Minnesota State University
*Seasonal Evaluation of Camden State Park’s Prairie Pothole*
Format: Poster

A wetland is an area with mostly wet soil, saturated with water above or slightly below the surface and populated by plants and animals adapted to wet conditions. Wetlands are important areas because they are hosts to a large variety of life. The objective of this study was to monitor the seasonal changes in a restored Prairie Pothole wetland at Camden State Park. Water quality was measured biweekly from September 9 through October 28 using LaMotte test kits. It was expected that the water quality of the wetland would change, and the vegetation in the wetland would be native. Only water temperature, water height and dissolved oxygen showed a large change. Alkalinity and pH of the water concurrently exhibited minor changes. Vegetation was abundant, dominated by narrow-leaved cattails. There was a lack of animals present in the area, which likely correlates with the lack of nutrients found in the water.

Seth Cordry
Stephen T. Allard (Faculty Mentor) Department of Geoscience, Winona State University
*Characterizing Oxide & Sulfide mineralization in the Nemo Shear Zone, Black Hills, SD*
Format: Poster

The Nemo shear zone (NSZ), a 1 km-wide ductile fault, is exposed in the northeastern Black Hills, South Dakota. The NSZ is part of the Dakotan tectonic zone, and was deformed during the suturing of the Wyoming province to the central North American land mass (1780-1715 ma.) Granitic intrusions of the Harney Peak age (1715 ma.) are proposed to have expelled hydrothermal fluid into this shear zone, producing and hydrothermally altering the minerals. The system was uplifted and exposed during the Laramide Orogeny (60-65 ma). The purpose of the research is to provide evidence of, and characterize, the mineralization, employing field, optical microscopy, and scanning electron microscope lab analysis. The 14km² field area centers on a 6km traverse following the NSZ through the Boxelder Creek-Formation, primarily a quartzite, and the Blue Draw Metagabbro. The NSZ cuts through both of these rock units SE to NW. Boxelder Creek quartzite within the NSZ has a pronounced shear fabric along which grains with syn-deformational pyrite cores grew parallel to shear, and are rimmed by post-deformational magnetite. The Blue Draw Metagabbro contains magnetite grains, as well as
post-deformational non-aligned ilmenite lathes cross-cutting the shear fabric.

The relationships between the pyrite cores, magnetite rims, and non-aligned ilmenite provide means to constrain the timing of the mineralizations, and argues for long term hydrothermal fluid flow throughout the structure. The lack of signature oxide and sulfide mineralization outside of the NSZ argues for structural control of the shear zone on hydrothermal fluid flow and resulting alteration.

PRESENTATION #34
Rose M. Coughlen
Physics Department at Winona State University
Liang Yang (Faculty Mentor), Kyle Coda
Department of Physics, University of Illinois Urbana-Champaign
Foundations for Characterizing a NaI(Tl) Crystal Using Alpha Spectroscopy
Format: Poster

DM-Ice is a dark matter detection project located at the South Pole designed to confirm or reject the results claimed by the DAMA/LIBRA experiment by measuring annual fluctuations caused as the earth moves through the dark matter halo. DM-Ice requires an extremely pure NaI(Tl) crystal in order to take accurate data. This presentation describes the process of identifying radioactive impurities within a NaI(Tl) crystal using a custom made apparatus. Utilizing Matlab and the ROOT data analysis framework, alpha spectroscopy can be used to determine what particulates exist within the crystal. The apparatus was moved underground at Fermi National Accelerator Laboratory in order to block additional background particles and is still collecting data to be analyzed.

PRESENTATION #35
Tad Dolphay
Sarah Phan-Budd (Faculty Mentor)
Department of Physics, Winona State University
Himansu Sahoo, Internship Advisor Argonne National Lab
High Energy Physics Department
Analysis of pi-zero decays produced by neutral current muon neutrino interactions
Format: Oral

Pi-zeros are produced through the interaction of high energy hadrons, and will decay into two photons 99% of the time. Using particles produced from a decay process, one can determine the mass of the particle that they decayed from. The NOvA collaboration produced pi-zeros through the interaction of a muon neutrino with an atomic nucleus, and after performing reconstruction on these events, parameters such as energy and the angle between the photon showers can be examined. By analyzing this data, we can begin to understand why the reconstructed pi-zero mass is lower than the true pi-zero mass of 135 MeV/c². Comparing these various reconstructed values against the true values will give us an idea of what portions of the mass equation are causing the issues and, once we gain this insight, we can begin to make an attempt to eliminate those events which are causing these issues in the first place.

PRESENTATION #36
Amber Dorr
John Gonzalez (Faculty Mentor)
Bemidji State University
Racial Microaggressions in American Indian Healthcare
Format: Oral

Health disparities are highly prevalent among American Indians for preventable diseases. Health disparities are caused by various factors and may include subtle forms of racial discrimination and the stress that associated with it. Subtle forms of racial discrimination have been coined as microaggressions. Microaggressions are verbal and nonverbal comments, insults and everyday sights that can be unintentional and unconscious by the perpetrator. Individuals who are the victims have serious physiological and psychological affects having an impact on health behaviors. Chronic psychosocial stress notably impair physical, mental, and behavioral health. Semi-structured interviews were conducted with 47 American Indians asking about their experiences of accessing healthcare services. A significant majority of the participants reported experiencing microaggressions when accessing healthcare services. This will be discussed along with the relationship between these experiences and other measures.

PRESENTATION #37
Michael Doyle
Kuldeep Agarwal (Faculty Mentor),
Department of Automotive Manufacturing Technology, Minnesota State University, Mankato
How does additive manufacturing process parameters affect the material properties in stainless steel – bronze composite?
Format: Oral

Additive manufacturing (AM), commonly referred to as 3D Printing, has gained a lot of popularity in recent times. New technologies and materials are being developed very quickly using the various AM technologies. Before these materials can be used in any application, it is necessary to find out how the process parameters affect the properties and performance of the parts. The technology is still in its nascent stage, so there is little understanding of how the process parameters affect the manufactured materials. The aim of this research is to find this process-property relationship for a unique AM process called binder jet printing. From this experimentation we will find unique uses of the AM technology, the materials
can be affected. There becomes a power struggle within the
teaching associations to either a younger TA or more experienced peers, our teaching
relationships can become complicated. We have taught multiple classes with
peers. When the balance between the TA and student is shifted
to either a younger TA or more experienced peers, our teaching
can be affected. There becomes a power struggle within the

PRESENTATION #38
Brianna Droubie and Kelly Douglas
Amanda Winrow (Faculty Mentor), Department of Nursing, Winona State University
Improving Newborn Outcomes with Kangaroo Mother Care (KMC)
Format: Poster

Kangaroo Mother Care (KMC), also known as skin-to-skin contact (SSC), is a simple method used in both premature
and full-term infants to stimulate health and well-being of the mother and baby (Gregson & Blacker, 2011; WHO, 2003).
Although there is an ample amount of research supporting the
use of kangaroo care and its benefits, the implementation of
it in the United States is lacking (Ludington-Hoe, 2011). Our
study focuses on the use of Skin-to-Skin Contact, its influence
on infants and parents, nurse utilization and barriers within the labor and delivery area. Through various interviews with
obstetric nurses, we discovered themes that influence the use of
SSC within an obstetric area and needs for awareness. Results and implications will be discussed.

PRESENTATION #39
Jessica Dulz and Randall Riehl
Keith Gora (Faculty Mentor)
Bemidji State University
Life as an Undergraduate TA: Sustaining Life Student/ Peer Relationships in the Classroom
Format: Oral

As a TA in the undergraduate teaching associate program we are
sometimes placed in the awkward situation of having authority
over friends, teammates and roommates. The situation can
jumble when one must be a boss and when one can be a friend.
Healthy relationships inside and outside the classroom can
become complicated. We have taught multiple classes with
peers. When the balance between the TA and student is shifted
to either a younger TA or more experienced peers, our teaching
can be affected. There becomes a power struggle within the

classroom between the TA and the student. While the situation
makes life complicated, we feel it can be overcome by applying
the theory of power bases. Our presentation will provide
background on the bases as well as demonstrate how they can
be used to balance relationships in a variety of environments
including the classroom and work place.

PRESENTATION #40
Hunter Edberg and Randall Riehl
Erika Bailey-Johnson (Faculty Mentor)
Bemidji State University
Fossil Fuel Free Fish House
Format: Oral

For the past year, the Bemidji State University Sustainability
Office has been working with several partners to create a fossil
fuel-free fish house. The house will eventually be placed on
Lake Bemidji and rented out through BSU’s Outdoor Program
Center. The fish house will offer students a chance to enjoy
the fantastic natural resources of the area, and at the same
time provide a learning experience in renewable energy. The
house will be heated and powered through solar technologies,
specifically a solar powered furnace (SPF) for heat and a
photovoltaic system (PV) for electricity. The SPF will be
installed by the Rural Renewable Energy Alliance in Pine
River, MN, and the PV system will be a project completed by a
class at Northwest Technical College. The house will also have
a small wood stove for back up heat. This project could not
have been done without the help of the community of Bemidji
and supporting organizations and institutions. This project will
allow students to enjoy a Northern Minnesota tradition in a
clean, sustainable way.

PRESENTATION #41
Ashley Eder and Benjamin LeMay
Brian Wisenden (Faculty Mentor)
Minnesota State University Moorhead
Plant-fish interactions in an experimental aquaponics system
Format: Poster

Aquaponic systems create an environment where plants and
fish benefit one another for filtration and nutrients. Porous lava
rock was used as a substrate instead of soil. Additional supports
were used to hold the plants upright. Tilapia (Oreochromis
mossambicus) produce a nitrogenous waste that provides
nutrients for the metabolic need of bean plants. We had four
different treatment group: 1) Fish + Food + Plants, 2) Plant
alone, 3) Fish + Food (no plants), and 4) Plants + fish food (no
fish). To monitor growth of fish and plants the initial and final
weights and lengths were measured. Initial and final levels of
nitrate, ammonia, and phosphorous of tank water were also
measured. This study will help develop a better understanding
how aquaponic system affect plant and fish development.
**PRESENTATION #42**

**Ashley Eder and Nikholai O’Hara**  
Donna Stockrahm (Faculty Mentor)  
Minnesota State University Moorhead  
*Effects of Mown Paths on Small Mammal Movements in Clay County, Minnesota*  
Format: Poster

Small mammals, with their relatively small home ranges, can be greatly affected by habitat fragmentation. We conducted our study in a grassland habitat near Rollag, MN, to investigate the impact of mown paths on small mammal movements. We live-trapped small mammals from 02 July to 06 August 2014 on 3, 7x7 grids, with 5m between trap stations. On 2 grids, a pre-existing mown path, 15.5m wide, ran down the middle of the grids. The third grid was continuous habitat with no pre-existing mown path. On 29 July 2014, a new path of the same dimensions was mown down the middle of this grid, and trapping was resumed. Five species were captured: meadow voles (MV) (Microtus pennsylvanicus) (n=80), thirteen-lined ground squirrels (TLGS) (Spermophilus tridecemlineatus) (n=23), and 3 of eastern chipmunk (Tamias striatus), short-tailed shrew (Blarina brevicauda), and masked shrew (Sorex cinereus). Of these, only 31 MV and 14 TLGS were captured more than once, with 29 and 14, respectively, caught at more than 1 trap station. Of these captured 1 time, only 6 MV and 8 TLGS were noted to cross over the pre-existing mown trails. On the grid with the newly mown trail, the entire population of small mammals was disrupted with no animals crossing the newly mown trail. In fact, most of the marked animals trapped just prior to the mowing seemed to move off the grid entirely. We concluded that mown paths, especially newly mown paths, can greatly affect small mammal movements in a negative manner.

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**PRESENTATION #44**

**Amanda Goedeke**  
Maureen O’Brien and, Glenn Davis (Faculty Mentor)  
History & English, St Cloud State University  
*Saint Margaret, Queen of Scotland, and the Benedictine Rule*  
Format: Oral

This paper examines the influence that the Benedictine Rule had on the life of Queen Margaret of Scotland (c. 1045-1093 CE), whose deeds would eventually have her canonized as a saint. The research for this paper was accomplished through close readings of both “St. Margaret, Queen of Scotland,” a hagiography (the written account of a saint’s life), and the Benedictine Rule, originally written by Saint Benedict (c. 480-547 CE). By examining the similarities between the Benedictine Rule and the actions of St. Margaret, this paper argues that Christianity in Scotland in the 11th century was formed the way it was because of the Benedictine Rule’s influence on Margaret during her reign. St. Margaret is a well-known saint within the Catholic Church, her deeds setting an example of the conversion, stability, and obedience that the Benedictine Rule required. Latin Christianity within medieval Scotland (before the English Reformation) would not have been as well developed if it had not been for her works.
rely on their intuition in general to make judgments, compared
to relying on logical reasoning, will show the highest levels
of accuracy. Participants viewed a series of video clips that
contained people telling truthful or untruthful stories. While
participants watched the clips they simultaneously filled out
a packet which contained ratings of each story teller and an
open-ended question on cues they used to determine truth from
falsehood. Participants also indicated if they thought the story
was true or a lie. Finally, participants completed a personality
questionnaire and demographic questions. Data collection is
ongoing and the final sample will consist of judgments from
over 40 participants. Our analyses will test whether or not
participants are accurate in detecting deception, and whether
those who are more intuitive are also more accurate. This study
is important because it extends past similar experimentation
by incorporating measures of personality traits related to use
of intuition while also working to replicate these intriguing
findings on the role of intuition in detecting deception.

PRESENTATION #46
Amber Godfrey
Heather Sklenicka (Faculty Mentor)
Chemistry, Rochester Community and Technical College
Phycocyanin Fluorescence in the Denaturing of
Phycobiliproteins in the Laboratory Setting for Allied Health
Students
Format: Oral

Chem 1118, along with other general chemistry classes,
needed an interesting lab to examine protein structures and
denaturing. A lab, by Robert Bowen, using Spirulina tablets
as the protein source was adapted for use in this lab. The first
week of the experiment, students isolated the protein from blue-
green algae found in Spirulina nutritional supplements. When
extracted, the protein was dark blue with red fluorescence when
illuminated by a light source. In the second week, students
tested a variety of compounds and temperatures to see if the
protein denatures under each set of conditions. In addition,
students titrated the protein with dilute hydrochloric acid and
quantified their results using MicroLAB technology. After the
experiment, students answered questions on their satisfaction
with the lab. The entirety of the students expressed an overall
high satisfaction with the lab.

PRESENTATION #47
Shandy Giron
David Higgins (Faculty Mentor)
English, Inver Hills Community College
The Little Mermaid and the Fear of Change
Format: Oral

For my research project I have chosen to examine the film The
The film is a fantasy tail about a young mermaid who falls
in love with a human prince. In the movie Ariel a beautiful,
thin mermaid with blue eyes gives up her voice, her tail and
her family to obtain the love of Eric a prince who she doesn’t
really know, but she is attracted by his physical appearance.
My project explores the particular American hopes and fears
reflected in The Little Mermaid, because I feel that the film
depicts our world today and what is being taught to girls from
an early age. Ariel’s choices reinforce women’s dependence
on men and teach young girls that living happily ever after
can only happen by finding a husband and spending the rest
of their lives as housewives. We observe how beautiful girls
are identified as objects rather than for their intellectual self.
I also feel that men have been portrayed as the dominant role
in a household, where a woman is always treated as second
because she is a woman. Why are woman sex objects? Woman
can stand on their feet next to Men and be equal. Why should
women lower their head and follow a leader? She should be
the leader of herself. I have examined scholarly sources and
agree with an article by Roberta Trite’s as she argues that the
movie depicts women as either self effacing or evil, incapable
of creating their own responsible power without depending
on men or stealing power from them. My research causes me
to believe that this work of literature shows that Americans
are afraid of changing their mind set. The implication of what
has been taught and implied to a way of living shouldn’t be
essential to the future of the coming generations. People hope
for a better future, implying the realistic morals to the new
descendants will allow for the equal partnership between men
and women in the future to come. This research is important
because it will broaden the perspectives for families who
watch the movie. It will engage a conversation with the young
kids giving the parents the ability to further discuss what the
kids are watching. Children will also open up their thoughts
and ideas which will emerge for a great lesson.
PRESENTATION #48

Melanie Graves and Ben Keilholtz  
Rafael Narvaez (Faculty Mentor)  
Department of Sociology, Winona State University  
*Media Usage and Learning Outcomes among Sociology Students*  
Format: Poster

We are studying the correlations between different new media usages (e.g., laptop, Facebook, videogames) and their effects on learning outcomes, learning expectations and student engagement on students in the social sciences at Winona State University. This research will help us see whether the use of new media can effect, positively or negatively, student achievement. In the Fall of 2014, a Research Methods class in the Sociology Department surveyed 48 sociology students who were asked fill out a close-ended questionnaire designed by this class. The questionnaire has fifty-two questions (variables). These include questions about media usage (e.g., hours of Facebook usage per day and week). Additionally, the questionnaire includes questions about student activities including sports involvement, fraternity or sorority involvement, clubs, hours of partying per week, and others. Questions also involve academic performance, including grade point average, hours of preparation for tests, hours sent on homework and how many credits. Forty eight sociology students participated in this study. Mean GPA was 3.2 with a standard deviation of 0.4. Fourteen or 29% participants were males and 34 or 70% participants were females. Forty-two study participants or 87% identified as white. Initial bivariate analysis shows significant correlation between a range of variables. The presentation will include discussion of descriptive statistics, bivariate analysis, as well as of regression models to specify specific contributions of various student activities to various learning outcomes.

PRESENTATION #49

Shrijana Gurung  
Damiano Fulghesu (Faculty Mentor)  
Minnesota State University Moorhead  
*Right Tetrahedron: Pythagorean Quadruples*  
Format: Oral

This research project primarily focuses on right tetrahedron and its integer edges and areas. We go through concepts of primitive triple and Pythagorean quadruples. We basically use ideas of Pythagorean quadruple to our right tetrahedron. We further investigate into right tetrahedron that has all integer edges, right tetrahedron that has integer area for the faces, right tetrahedron with integer areas and principle edges are integers and to find a right tetrahedron that has all integer edges and areas.

PRESENTATION #50

Patrick Hager  
Francis M. Mann (Faculty Mentor) Department of Chemistry, Winona State University  
*Quantification of Phenolics in Kombucha Tea*  
Format: Oral

Kombucha tea is a fermented drink that is produced by adding a symbiotic culture of bacteria and yeast (SCOBY) to sugared tea. The fermentation is said to produce compounds which have numerous health benefits. Many of these benefits have been linked to the polyphenolic compounds that are found in the tea which have previously shown bioactivity. This experiment focuses on determining if the Kombucha produces polyphenolics through fermentation, or simply changed the tea molecules which changed the activity. SCOBY was applied to black tea and a separate SCOBY to a “mock” tea which involved all the nutrients the SCOBY should need to thrive without the phenolics present. The SCOBY was allowed to ferment in a four week time course. These SCOBYS were then subcultured on appropriate mock or black tea media and allowed to ferment further. Aliquots were taken every two weeks and tested using the Folin-Ciocalteu assay. The initial findings show that there was an inverse trend in the overall phenolics in the mock tea vs black tea. The concentration of the black tea phenolics decreased over time, while the phenolics from the mock tea increased. Both teas were also hydrolyzed and separated using a C18 resin in order to further study the character of the chemical products.
**PRESENTATION #51**

**Daniel Heerema**  
Heather Sklenicka (Faculty Mentor)  
Chemistry, Rochester Community and Technical College  
*Carbohydrates and Artificial Sweeteners: A New Optical Rotation Laboratory for Allied Health Students*  
Format: Poster

In our allied health second semester chemistry course students had access to polarity, but the lab was unsuccessful due to lack of engagement and inconsistency of results. An alternative activity was devised to educate in specific rotation of chiral carbohydrates with an investigative approach to identifying simple carbohydrates and artificial sweeteners against known solutions. Experimental specific rotations of pure glucose and fructose were collected to be used as standard solutions at a variety of concentrations. The optical rotation of Sprite, Sprite-Zero, Crystal Light, Mio and Propel solutions were measured. These will be used as potential unknown samples for experimental identification based upon carbohydrate and artificial sweetener content. Each unknown was tested at different concentrations following removal of carbonation, to optimize light transmittance in the polarimeter. This presentation will include preliminary results to determine the best unknowns for student use along with development of a lab to implement in Fall 2015.

**PRESENTATION #52**

**Colin Helfenstein**  
Andrew Conteh (Faculty Mentor)  
Minnesota State University Moorhead  
*Present-Day Imperialism*  
Format: Oral

Imperialism, or the expansion of a nation’s power through use of the military, colonization or other methods, is generally taught in the United States as something that is a part of history. I wish to reveal that governments are still using the policy of imperialism, even if that is not what they call it. I wish to educate about the various methods used today by governments around the world as well as offer some alternative perspectives on recent events from around the world.

**PRESENTATION #53**

**Samantha Holien**  
Timothy Secott (Faculty Mentor)  
Department of Biology, Minnesota State University, Mankato  
*Classroom Prevalence of Methicillin Resistant Coagulase-Negative Staphylococcus Species Isolated Students*  
Format: Poster

Methicillin-resistant Staphylococcus aureus (MRSA) is becoming more prevalent in the population, specifically in clinical settings. Because Staphylococcus aureus is a virulent organism (i.e., it expresses the enzyme coagulase), methicillin resistance in this species is of particular concern. However, focusing on resistance in this organism only can underestimate the overall prevalence of the resistance gene, mecA, which can be harbored by “avirulent” (coagulase-negative) species. Four out of thirty coagulase-negative Staphylococcus isolates recovered from students participating in a class exercise in Medical Microbiology in 2014 were observed to grow in the presence of oxacillin, which is used to detect methicillin resistance. These isolates will be identified to species and tested to determine the minimum concentration of oxacillin necessary for growth inhibition. In addition these isolates will subjected to Polymerase Chain Reaction testing for the presence of the mecA gene. The results of this study will be compared with those from an earlier investigation from this lab in order to obtain a broader view of the distribution of methicillin resistance genes in southern Minnesota.

**PRESENTATION #54**

**Emily Homan, Mike Krug, Sarah Swanson, Jacob Stock and Kyler Steffe**  
Tamara Berg (Faculty Mentor)  
Women’s, Gender, & Sexuality Studies Program, Winona State University  
*The Precarity of Safety: Bystander Intervention Praxis as a Challenge to Systemic Violence on Campus*  
Format: Poster

Under United States federal law, students are purportedly guaranteed a right to education free from sexual violence and harassment. However, as a conservative estimate, 1 in 5 women will be sexually assaulted while in college (U.S. Department of Justice 2014). College campuses across the country continue to tolerate and minimize campus violence. There is an institutionalized culture of victim-blaming on college campuses, and not enough resources are dedicated to addressing the pervasive and systemic injustices of gender-based violence (GBV). Universities and colleges have not only failed to critically address GBV, but there is evidence that schools across the country continue to tolerate campus violence and mistreat survivors (Krebs et al. 2007). Across the country students are calling out their institutions and demanding that GBV be addressed as a serious systemic problem deeply rooted in campus culture.

Students at Winona State University are engaging their peers to name the problem of gender-based violence on campus with a focus on bystander intervention education that challenges university and community norms to hold institutions accountable and demand systemic change (Banyard et al. 2007). This poster will summarize the bystander intervention education program and discuss the data collected from pre/post surveys to assess the program’s impact on campus.
In 2014, over 29,000 Minnesotans were diagnosed with cancer. From direct medical costs, to lost productivity, to its effects on personal relationships, cancer touches everyone. In an effort to alleviate this multifaceted issue, it is necessary to synthesize new and more effective chemotherapeutic agents. Natural products containing alpha-methylene gamma and delta lactones in their structure have been shown to exhibit a wide range of bioactivity including cytotoxicity towards cancer cell lines. These compounds work by inhibiting a protein complex called nuclear factor-kappa B (NF-kB). The NF-kB protein plays a key role in cell division and has been found to be continuously active in cancer cells. Inhibiting phosphorylation of IKK, a protein in the NF-kB pathway, has been shown to suppress tumor growth by preventing NF-kB release into the cell nucleus. Recently, some simple coumarin analogues containing an alpha-methylene functional group were prepared and shown to exhibit high activity against leukemia, breast, and colon cancer cell lines. An indanone cyclic system is similar to a coumarin system. The difference between these two cyclic systems is that a coumarin is an ester while an indanone is a ketone. The attributes of a ketone provide insight for why it is expected to be a better chemotherapeutic agent than an ester. Ketone carbons are more positive than ester carbons, which should allow the indanone analogue to react more quickly with thiols than the coumarin analogue. A ketone is more metabolically stable than an ester, giving it more time to react with cancer cells, whereas esters can be cleaved in your body by enzymes called esterases. Using suspected natural and synthetic IKK inhibitors as templates, a novel alpha-methylene indanone is being synthesized. This compound is expected to prevent NF-kB activation, therefore inhibiting unregulated cell growth.

For my research project, I chose to examine the adaptation of the Stephen King book The Shawshank Redemption, directed by Frank Darabont in 1994. The movie centers on Andy Dufresne, a young and wealthy banker, who is sentenced to life imprisonment in Shawshank prison after his wife and her lover are found murdered. While in prison, Andy befriends a man named Red, who uses his connections in the prison to acquire certain items for inmates. Slowly, Andy starts to use his knowledge of taxes and banking to win favor with the guards and the warden, who in turn give him special privileges. However, one day, a new inmate reveals to Andy that he knew the man who actually killed his wife and her lover, and that he could get him to make a confession. Andy goes to the warden and asks him to help set up an appeal so he can get freed, but the warden refuses, because Andy knew quite a bit about the wardens illegal operations and he could not risk that information getting out. Andy realizes no one will help him out with his problem, so he breaks out of jail and escapes to Mexico with all the money he made for the warden over the years. My project explores the particular American hopes and fears in The Shawshank Redemption. In order to explore these cultural hopes and fears, I have analyzed the movie for its deeper meaning by examining it with a few different techniques. I have also cross-referenced the information I have pulled out of it with scholarly sources that have to do with the cultural and social movements of the time. My sources dealt with subject matter such as the dangers of prison and the growing trend of changes towards gender equality. My research leads me to believe that this movie shows that Americans are afraid of losing their masculinity. For example, some of the sources talk about how every year, more and more women buy a powerful ‘muscle’ car, while the amount of men buying them is starting to decline. On the other hand, my sources also show how Americans are hopeful that the traditional views of masculinity can still be redeemed. This research is important because the concept of masculinity has been a huge part of being an American ever since this country was formed. However, masculinity is slowly fading away. Instead of society focusing on making men to be both mentally and physically strong individuals, it seems like its forcing them to become smart enough to just do a certain job, which causes them to wither away in their cubicles and in traffic. It seems like now the only options out there for men who want to maintain their masculinity are to join the army or become a lumberjack. Every now and then a group of men meet up to talk about how their masculinity is slowly being taken away from them and how they can fix this. Unfortunately, it does not seem like this has done any good for the cause, as this has been going on since the 90’s.

Studies investigating hemoglobin O₂ affinity in the tiger salamander (Ambystoma tigrinum) have shown a marked increase in O₂-affinity of neotenic versus terrestrial individuals. This shift in O₂ affinity is partially explained by the presence of a novel indanone analog.
of allosteric regulators, however this mechanism alone may not account for the observed differences in O₂ affinity. We investigated differential gene expression of α-globin subunits and its effect on O₂ affinity. The tiger salamander has two copies of adult α-globin genes (α_major and α_minor) and one copy of β-globin. The α_minor subunit is usually expressed at lower levels than the α_major subunit, thereby accounting for only a fraction of the hemoglobin protein found in tiger salamanders. However, the amino acid substitution 40(Lys→Gln) in α_minor potentially reduces the Bohr effect, thereby increasing O₂ affinity. This study examined gene expression of α_major and α_minor from neotene at different times of the year in which they experienced different levels of dissolved O₂ to determine if α_major and α_minor expression changed under differing O₂ availabilities. Gene expression levels of α_major and α_minor were evaluated through RT-qPCR.

PRESENTATION #59
Shruti Jagannathan
Latha Ramakrishnan (Faculty Mentor)
Chemistry and Biochemistry, St Cloud State University
Analyzing the Pharmacological Effects of Picrotoxin in Regenerating and Intact Dugesia Tigrina (Planaria) Worms
Format: Poster

In the United States, epilepsy affects approximately 2.3 million adults and 467,711 children, with 150,000 new cases diagnosed annually. This condition is “a chronic neurological condition characterized by recurrent seizures.”(Centers for Disease Control, 2013) With an idiopathic nature of epilepsy, further understanding and development in management of this condition is vital. This particular study is focused on analyzing regenerating planarians (Dugesia Tigrina) in comparison to the non-amputated worms, when exposed to a picrotoxin, a convulsant drug. The pSLM method was utilized in quantifying and analyzing the relationship between different epileptic drugs. This method involves subjecting individual planaria to increasing drug concentrations and quantifying the effectiveness of the drug by the type and number of seizures observed per minute, over a five-minute time period. (Rawls et.al). To date, this study is the first to analyze the effects of picrotoxin in regenerating planarian worms.

PRESENTATION #60
August Kammueler
David Higgins (Faculty Mentor)
English, Inver Hills Community College
A War on Two Fronts: Historic Competition Illustrated Through the Nissan GT-R and Chevrolet Corvette
Format: Oral

My essay dissects and examines the extreme competition of the current six-figure supercar market. More specifically, I have chosen to examine the competition between two of the fastest, most technically advanced, and sought after performance cars available for purchase today: the Nissan GT-R R35 and the Chevrolet Corvette C6 ZR-1. I chose to look back through history as my method of examination between these two competitors. Starting just after World War II, Nissan and Chevrolet quickly became rivals in the automotive market and are still locked in a heated tug-of-war for sales of their flagship supercars. I used simple yet effective research methods such as looking back through history, researching market demographics and statistics, and even speaking with owners of both contrasting supercars in an effort to establish an honest, realistic, and powerful analysis of what fuels this relentless competition. After researching several sources and gathering vital information, I was able to reach the conclusion that both vehicles are incredible examples of automotive mastery and dedication to excellence. However, capitalism and its ability to fluctuate wildly with changing consumer demands has proven once again to be an unpredictable mistress. To conclude, I would strongly argue that this research is important because it enables us to view capitalism in a much more animated form. Viewing automotive competition as a branch off the tree of capitalism illustrates many vital aspects of a free-market economy and allows many connections to be made within our own minds. Sometimes all we need to understand a complex topic is the right vantage point. I believe I have, through the use of research and reporting, provided car enthusiasts with an honest and genuine view of just how omnipotent capitalism is in the race to 200 miles per hour.

PRESENTATION #61
Sean Kelley
Joan Francioni (Faculty Mentor)
Department of Computer Science, Winona State University
Energy Use Implications of Responsive Design Websites on Mobile Devices
Format: Poster

Mobile devices are an increasingly popular choice for browsing the web. In the early days of the mobile web, web developers provided a good user experience by limiting the functionality of the site. Today, a good mobile experience means bringing the full desktop experience to a small screen, using a concept known as “responsive design.” Unfortunately, this change has significantly increased the amount of data that is downloaded to the mobile device each time a webpage is viewed. We wish to determine how much energy is being used as a function of the amount of data downloaded. We will use a high-precision digital power multimeter connected to different mobile device batteries to measure the amount of Joules used to download and render a website. By gathering data on several websites, we will be able to calculate an average measurement in Joules per Kilobyte per website. We expect this number to be relatively high compared to websites not using the “responsive design” concept. In addition, we believe simple changes in website designs can result in significant energy savings.
These implications on the energy use of websites in regards to sustainability will be discussed as well as possible solutions for improvement.

PRESENTATION #62
Benjamin J. Keute
Stephen T. Allard (Faculty Mentor) Department of Geoscience, Winona State University
Passive Folding Model for Deformation of Nemo Group During Final Suturing of the Wyoming and Superior Province, NE Black Hills, South Dakota
Format: Poster

The metamorphic rocks in the Black Hills of South Dakota preserve evidence of the 1700–1800 Ma event attaching the Wyoming province to the core of North America, where North and South Dakota are today. These rocks were previously deep in the crust, but the ~65 Ma tectonic event that formed the Rocky Mountains also caused these rocks to be uplifted, exposing the rocks deformed during the older assembling, and providing an excellent location to study this event. This research investigates the mechanism responsible for folding near the Nemo Shear Zone (NSZ) in the NE portion of the Black Hills.

The folded rocks in the area include the Boxelder Creek Quartzite, which has a NE-SW shear fabric parallel to the NSZ. This has been interpreted two ways. One is The NSZ crosscuts older folds deformed by a flexural slip folding, similar to bending a deck of cards. The second is the NSZ developing synchronous with passive folding, which is like sliding the cards past each other.

During field work, samples were collected from outcrops and observed microscopically to analyze the fabrics seen in the outcrop. This helped determine that inside the shear zone the fabric is very strong and weaker outside the shear zone. The fabric is interpreted as a counter clock wise rotation combined with compression. This is consistent inside and outside of the shear zone therefore we propose a single event of compression and lateral movement that folded these rocks passively.

PRESENTATION #65
Kaylie Knipe
David Higgins (Faculty Mentor)
English, Inver Hills Community College
Better Than You: America’s Distaste for The Mentally Disabled
Format: Oral

For my research project, I have chosen to examine Flowers for Algernon (1958) by Daniel Keyes. My project explores the particular American hopes and fears reflected in Flowers for Algernon. In order to explore these cultural hopes and fears, I have performed a literary analysis of a primary source in order to answer specific cultural hopes and fears at a given moment. I’ve also used secondary research from scholarly sources to gain a deeper knowledge and understanding of the source and the cultural hopes and fears it touches upon.

I’ve gathered several secondary sources so far, and the topics include representation of people with disabilities in literature, an article written by the author describing how he came about writing this story, how this story can influence young students and adults alike no matter what the age, and a study on different methods used to help children with significant disabilities learn better. My research causes me to believe that this work of literature shows that Americans are afraid of disabilities and having some sort of handicap. They fear being less than others, so they look down on the disabled to feel better about themselves, though they themselves are not all that great. This could be something that goes far back, if you really think about it. Slavery was another aspect of that, they way white people looked down on African Americans and saw them as property. Granted, viewpoints like that are not totally extinct, but they have significance in our history as well. At the same time, Americans are also hopeful for their desire for knowledge. They want to know what everyone else knows and stand on equal ground, maybe even higher than others. America strives to be the best in knowledge and technology, and work with others to gain their knowledge despite the fact that we probably don’t share our own. Though America shares research more often nowadays with many countries, we still want more, always more. We hunger for knowledge and glory, to be better than everyone else at something. Either way, if we want something we’ll get it. This desire is quite funny though, because we haven’t used the information and statistics gathered from other countries to better our own because we’re
so full of ourselves and thinking we’re the best. This research is important because these hopes and fears honestly go way back. If you think about the revolutionary war, we despised being less than the British Empire, being less than what we could be. Instead of just taking it, we stood up for ourselves. Today with the United Nations in formation, the sharing of knowledge and technology is more common whether as an act of decency or diplomacy. Why take it out on the mentally disabled, though, when we can strive for it? People want to look at those lower than them to lift themselves up, it’s human nature. Why don’t we try changing that? We can all share our experiences to get as better understanding of the world around us, but equality is key.

PRESENTATION #66
Alex Koerber
Stephen T. Allard (Faculty Mentor) Department of Geoscience, Winona State University
Interpreting variably-oriented folds within the Nemo Shear Zone, northeast Black Hills, South Dakota
Format: Poster

The Rocky Mountain building event uplifted the Black Hills of South Dakota, exposing the eastern edge of the Precambrian Wyoming Province. The uplift provides a window to the rock deformation from the suturing of the North American mid-continent plate and the Wyoming Province. This research focuses on folding associated with a transpressional shear zone formed during the final stage of suturing, and recorded in the Boxelder Creek Quartzite (Xbcq) and Blue Draw Metagabbro (Xbd) in NE Black Hills.

Transpressional shear is where colliding plates undergo compressional and shear deformation simultaneously. Movement and stresses from colliding plates can affect fold geometry and orientation, and variation can be attributed to the obliquity of colliding plates, spatial relationships of rock units in the shear zone, the degree of shear intensity, rheology of rock units, and pre-existing features in the rocks. In the NE Black Hills, the Xbcq and Xbd preserve shear related folds with varying orientations ranging from northwest (perpendicular to movement direction) and southeast (parallel to movement direction). This project describes the shear related folds in this area and attempts to interpret the cause for the variation observed.

Initial interpretations suggest that rheological constraints, shear intensity, and pre-existing features may have affected the fold orientations. NW-trending folds were common in strongly sheared portions of the Xbcq and Xbd, whereas the SE-trending folds were more common in less sheared components. During progressive shearing, early-formed folds or pre-existing features with hinge lines perpendicular to movement are rotated so they are parallel to the movement direction.

PRESENTATION #67
Debra Koenig
David Higgins (Faculty Mentor)
Psychology, Inver Hills Community College
Why do people become bullies?
Format: Oral

I began my research about the increasing issue of bullying that has exploded in our schools. The problem is widespread through schools across the nation. Through my research I began to think about what can cause or draw people to become bullies. Why do people become bullies? What do bullies gain from causing harm to others? It seems as though parents are not teaching their children that is wrong to hurt others referring to the golden rule “treat others how you want to be treated”. Do bullies feel that their actions are acceptable? I wanted to know the reasons why people behave in manners of torturing others through mean teasing, taunting, physical abuse, or threats of harm toward another person. There are students that do not want to attend school because they fear a bully. For some going to school becomes unbearable and stressful. The stress is not from their studies, but instead for being bullied. The bullying can begin as early as kindergarten. Bullies can offset the self-esteem and confidence at an early age. I searched for articles that discussed what conditions would make someone acquire behaviors such as bullies do. I looked for psychological resources that spoke about reasoning that could contribute to acts of bullying. I found research that supports my belief that bullying is a learned behavior from their upbringing that can include poverty, crisis, abuse and violence. As a society, we need to look for these types of issues and help these children receive therapy or at the least some kind of support system. I believe that children develop a mindset and portrait of themselves that takes them from the victim of circumstance to becoming the villain. The cycle can continue from negative learned behavior making children vulnerable to trying to protect themselves from others by retaliating against another to give them power from the times that they felt helplessness from another. Bullying is a learned behavior. We can teach and provide the correct needs of a young child to teach them the difference of negative behavior instead of positive behavior. I researched Head Start programs that give support to children that come from poverty. Head Start gives poor children the opportunity to catch up to children that are academically farther then they are. This program has been successful for helping create positive social skills and positive behaviors that can aid children in developing abilities to continue their education. I am interested in how so many children simply fall into the cracks of our system sometimes turning our youth into monsters.
In reading a hagiography, the life of a saint serves a number of different purposes. The main purpose provided by a hagiography comes in the form of a lesson, oftentimes emulated in the real world by average Christians to the best of their ability, or more often than not, by monks residing in monasteries. The life of St. Marina the Monk from the 6th century, a woman who spent most of her life garbed as a man while living in a monastery, provides such an example to be emulated by the residing monks. By examining the historical context of the time period in which the author wrote and performing close readings of the text, the lesson and theme to be taken from the hagiography can be much more easily concluded. While the author is unknown, the text comes from the libraries of the Monastery of St. Catherine on Mount Sinai in current day Syria and was written during the 8th century. At this point in time, Islam was on the rise and many Christians faced forced conversion and sometimes persecution by the ruling Islamic Empire. Likely due to a rise in Christians being forced to convert to Islam at the time of its creation, the concept and theme of spiritual endurance is the focus of Marina’s story, which served as an example to the residing monks in what is now known as the Monastery of St. Catherine on Mount Sinai. Additionally, the use of a woman showcased that even one of the weaker sex was capable of enduring a life of asceticism even in the face of great adversity, by denying her gender and emulating the life of Christ, thus providing an even stronger example to the monastery’s monks.

Our research project is focused on the effect of steroid hormones on neurogenesis in the brain of Anolis carolinensis. The seasonal changes in steroid hormone levels in these lizards are associated with changes in the morphology of brain regions controlling reproductive behaviors, such as the preoptic area (POA), medial amygdala (AMY), ventromedial hypothalamus (VMH). We examined how different steroid hormones influence the number of new neurons present in the brain. Specifically, we hypothesize that testosterone (T) will increase neurogenesis in the regions of the brain that control reproductive behaviors in green anole lizard. In this experiment, we utilized immunohistochemistry (IHC) to identify the effect of hormones on the addition of new cells in the brain. Adult male anoles were castrated and a capsule containing T, dihydrotestosterone (DHT), estradiol (E2), or left empty as a control was inserted. Bromodeoxyuridine (BrdU), a compound that marks newly dividing cells, was injected into the animals once per day for five days. Tissue was collected 30 days after the last injection, frozen immediately and sectioned for future small mammal studies on the base.
on a cryostat. We exposed the brain sections to antibodies for BrdU and Hu, a protein expressed exclusively in neurons. We counted the number of cells that were labeled with the antibodies for BrdU and/or Hu, which would indicate that the cells are new cells (BrdU only) or new neurons (BrdU and Hu double-labeled). Our results will increase the understanding of how steroid hormones are influencing neurogenesis, which may be critical in determining future treatments for stroke or neurodegenerative disorders.

PRESENTATION #72
Benjamin Lencowski
David Higgins, Faculty Mentor
English, Inver Hills Community College
American Sniper and Self Loathing
Format: Oral

For my research project, I have chosen American Sniper, the Autobiography of the most Lethal Sniper in U.S Military History by Chris Kyle with Scott McEwen and Jim Defelice 2012. My Project explores the American hopes and dreams in American sniper by Chris Kyle. In my research from reading the book and also watching the movie American sniper, also with scholarly sources used to find the underlying theme that Chris Kyle is showing that he has a strong self-loathing for one’s self, also some of fears is losing one’s life and watching brothers in arms lose one’s life. Some of the hopes I have found are joining the military gives one a sense of something bigger than life and knowing you are fighting for your country. After finding that Chris Kyle has a self-loathing for one’s self my secondary research branched off to find to using these sources. Social impact of war, the modern way of war, society, and peace, perspectives on professionalism in the U.S Military, A different Iraq: writings from the front, and Lines of sight: watching war in “jarhead” and “My: killing Time in Iraq. How I found all of these sources useful to my literary analysis is because it shows that most U.S military personnel have sense of high pride, deep values and self-loathing. My research cause me to believe that this work of literature shows that Americans have a deep fear of war, and losing a loved one in time of war. At the same time Americans are also hopeful for war because it brings a sense of comfort that U.S military is fighting for freedom, and also it takes a strong willed person to step and join the military to fight for what may or may not be right at the time. This research is important because for the past decade the U.S has been at war or in some type of combat.

PRESENTATION #73
Hunter Ludwig and Tad Joel
Kuldeep Agarwal (Faculty Mentor)
Department of Automotive Engineering Technology, Minnesota State University, Mankato
Wear properties of 3D printed Stainless Steel-Bronze Composite
Format: Poster

3D printing has brought about a big revolution in the manufacturing industry in the last few years. There are various different materials and processes which are currently being used. One of these processes is the Binder Jet process which works similar to an inkjet printer except that it prints on metal powders. The aim of this research is to study this Binder jet process and to find the properties of materials made from it. We worked on Stainless Steel - Bronze composite material made from the 3D printing process. Different process variables were changed and the parts were made for the study. One of the properties which was investigated was the wear of the materials. Wear is an important property which determines how the parts will behave in service. For example, if we make a piston and cylinder of a car it will wear in service and it is important to understand how this material will work in that environment. We did experimentation based on ASTM standards. Different samples were tested under similar conditions to find out how they wore using a pin-on-disk test. The samples were weighed before and after the testing and the weights were used to calculate the wear rate. The worn pieces were examined under a SEM to see the wear pattern at the microscopic level.

PRESENTATION #74
Robert Mahrer
Gary Mead (Faculty Mentor)
Department of Automotive Engineering and Technology, Minnesota State University, Mankato
Uprights
Format: Oral

The upright is a metal component designed to be attached to the car. One of the designed tasks for the uprights are to hold the wheel bearings in the center of the upright for the hub and wheel. Next task the uprights have is, to connect to the suspension where the mounts have to have clearance for motion up and down. Third task the uprights are designed to perform is, have a steering rod attached to the upright. Without the steering rod the car would not be able to steer in the front. The last task for the uprights is, being designed to withstand the forces of 1.4 g’s entering the turn. The first design criteria about the uprights is the size and what are the boundaries. From there, the old uprights were inspected to make revisions and improve the design. The uprights were modeled in 3D parametric modeling. With the 3D modeling, the uprights
were able to run a stress strain test to see if the uprights will with stand 1.4 g’s of force. From the 3D modeling the design was uploaded into another program to be machined out of a block of aluminum. From going through the 3D modeling to machining, there was a big learning curve that was found. The original design was too complicated and was very costly to have a machine shop to machine the uprights. Therefore a second and even a third design revisions were made to lower the cost of machining the uprights.

PRESENTATION #76
Alexis McCall
Daniel Moen (Faculty Mentor)
Department of Family Consumer Science
Minnesota State University, Mankato
How Rural Families Cope when a Loved one is Diagnosed with an Eating Disorder
Format: Poster

From the lens of the ABCX family stress model (Hill, 1949), this single case study examined the perception, resources, and outcomes of one family in rural Minnesota who effectively adapted after learning that a loved one was diagnosed with an eating disorder. In this study, researchers looked to see what resources and services the family used that helped them during the process of recovery. Additionally, researchers were interested in what services/resources could have been made available to better aid in the process. This rural family was recruited using printed flyers. A qualitative survey was sent out electronically for the whole family to complete. The results were reviewed between two researchers for qualitative salience. The findings suggest that despite the stressor, the family was brought together in the process of recovery. It was also noted that a majority of the family’s support came from close friends. In terms of needs, the family reported a lack of access to comprehensive services as they frequently drove ninety miles or more to obtain proper help. From a clinical standpoint, a majority of earlier research has focused on the pathology of eating disorders and family breakdown. This study has opened the door for additional investigation into rural family strengths/resources. Furthermore findings from this study may be used to shed some light on this underrepresented rural portion of the population in hopes of highlighting effective coping strategies for other rural families. Future studies would benefit from using a broader sample as well as conducting in-person interviews.

PRESENTATION #77
Krista Migneault
David Higgins (Faculty Mentor)
English, Inver Hills Community College
Budget Surpluses of the 1990’s
Format: Oral

The topic of my research paper is about the surpluses the federal government had during the last two years of the twentieth century. My inquiry question was what was going on with the economy for that to happen. I used several sources including my textbook from my macroeconomics class called Brief Principles of Macroeconomics by Gregory Mankiw, Wikipedia, and information from the U.S. Bureau of Economic Analysis. The thesis of my paper was about discretionary fiscal policy, automatic stabilizers, and an expanding workforce. With all of the research I did my findings that gave the economy its surpluses came down to the three things I just named. With discretionary fiscal policy, that gives Congress and the President annual control over the budget by raising or lower taxes and increasing or cutting spending, President Clinton raised taxes by signing into law the Omnibus Budget Reconciliation Act of 1993. This act created two new tax brackets for individual tax rates and three new brackets for corporate income. Then with the automatic stabilizers they do two things, they regulate the amount of taxes being brought in and the amount of Unemployment Insurance going out. This is something that is done without any policy changes made by Congress or the President. The last thing that affected the surpluses in 1998 and 1999 was the expanding workforce. In the 1990’s there was an explosion of new jobs in the technology, financial, and construction sectors that really increased the amount of taxes being brought in and the decreased the amount of Unemployment Insurance that was going out. People were able to spend more money to boost the economy which also helped. This research and paper are important because every year there is a deficit that adds to the national debt, and for four years straight we had federal government surpluses, from fiscal year 1998 through fiscal year 2001, this was the first budget surplus since 1969. Every year the President tries to balance the budget, and from my research, one of the biggest contributors to our surpluses was the new technology that was introduced to the world, so many good things happened to our economy from that and who knows when someone will
stumble on to a new invention like that. I don’t think that anyone anticipated the internet to be as big as it was just like when electricity was first introduced many people thought it was just a passing fad.

PRESENTATION #78
Linda McBrayer
Sumiko Otsubo (Faculty Mentor)
History Department, Metropolitan State University
Sex-selective abortion, eugenics, and embodied citizenship in post-independence India
Format: Oral

This paper will provide an overview and analysis on the issues of sex-selective abortion, the practice of eugenics, and embodied citizenship for women in post-independence India. The paper will provide an in-depth, historical perspective on both the governmental and cultural aspect of sex-selective abortions, and will compare the practice of eugenics between post-independence India and the United States as a means of population control and reproduction by those deemed less fit by the state. Finally, the paper will offer insight into the connection between the body and citizenship, and how these practices effect the embodied citizenship of the women of India faced with these issues.

PRESENTATION #79
Angela Miller, Ashley Forman, Daniel Gitto and Alex Russell
Amanda M. Brouwer and John C. Johanson (Faculty Mentors)
Winona State University
“Are there things that we missed?: A Qualitative Exploration of Experiences of Academic Achievement in Collegiate Athletes
Format: Poster

Research indicates that on average student athletes have poorer academic performance than non-student athletes. To better understand how the experience of being an athlete affects academic performance and ways to improve academic success, we conducted a qualitative study exploring the academic and athletic experiences of college athletes. A semi-structured interview was used to conduct 6 focus groups with 4 different male athletic teams. Data were analyzed using Consensual Qualitative Research Methodology. Participants expressed high levels of commitment to sports and academics, often noting their interdependence. The effect of challenges and benefits on academics were discussed. Time restraints of scheduling and athletic commitments made academic success more difficult because it led to missing class, and making up course work or needing to talk to professors. Benefits like obtaining life skills and learning to work hard facilitated both athletic and academic success. Finally, the experience of their first year as a student athlete was discussed as challenging because of the difficulty dealing with choice in academic, social, and athletic responsibilities. However, athletes also noted that first year experiences can motivate positive change because the environment itself is an instigator for change. Being a student athlete had both positive and negative effects on academic success. The role the first year in college played was important to shaping academic success. Learning to overcome feelings of exhaustion was important for overcoming first year challenges and was expressed as providing essential life skills used both in the classroom and in their sport.

PRESENTATION #80
Abdihakim A. Mohamoud, Mary Soderlund, Abigail Schraufnagel and Rachel Dahl
Osvado Martinez (Faculty Mentor)
Biology Department, Winona State University
Establishment of a system using THP-1 human monocytes to distinguish between myeloid differentiation primary response gene 88 dependent or independent pathogen associated molecular pattern signaling
Format: Poster

The purpose of this study was to establish a simple assay using a THP-1 X-Blue human monocytic cell line to examine the myeloid differentiation primary response gene 88 (MyD88) dependence of pathogen recognition receptors (PRR) induced signaling by various pathogen associated molecular patterns (PAMPs). Immune cells such as monocytes express PRRs in order to sense the presence of molecules often associated with pathogens or PAMPs expressed on potential pathogens. Toll-like receptors (TLRs) represent a subset of PRRs. PAMPs stimulate TLR signaling in both an MyD88-dependent and MyD88-independent manner, or independently of MyD88 using non-TLR PRRs. To understand the response of immune cells, it is of interest to delineate the molecular pathways involved in immune signaling. The response of wild type (wt) and MyD88 deficient THP-1 monocytes upon treatment with phorbol ester (PMA), an activator of Protein Kinase C (PKC), Heat Killed Listeria Monocytogenes (HKLM), a TLR agonist, L-Ala-gamma-D-Glu-mDAP (Tri-Dap), a bacterial product, and Lipopolysaccharide (LPS), a bacterial cell wall TLR4 agonist was tested for NF-kappa B and AP-1 transcriptional activation which is assayed in THP-1 X-Blue cells via a simple colorimetric assay. Treatment with LPS, HKLM, PMA and Tri-Dap of THP-1 wt showed NF-kappa B and AP-1 signaling while only Tri-Dap stimulated THP-1 MyD88-def. cells confirming that only Tri-Dap stimulation leads to MyD88 independent signaling. Altogether, these results demonstrate that THP-1 X-Blue cells can be used to distinguish between MYD88 independent and dependent AP-1 and NF-kappa B signaling.
A prominently recurring artifact within the Old English poem, "Beowulf," is the image of a boar-ornamented helmet. Coincidentally, war gear that featured boar figures is common within Medieval literature and archaeology. As Beowulf and his men arrive in Daneland (Denmark), &quot;Boar-figures shone over gold-plated cheek guards, gleaming, fire-hardened; they guarded the lives of the grim battle-minded&quot; (Beowulf 303b-305a). This description matched with the strong heroic ethos of the Medieval Scandinavian world implies that the boar image acted as a guarantor to warriors. As one dives deep into the worlds of &quot;Beowulf&quot; and Medieval society, it becomes apparent that the boar figure was a sacred icon within Germanic mythology and the Scandinavian worldview. The poem alludes to the boar possessing mystical powers as the war-gear rhetoric indicates the image as a symbol of great protection. There are many examples of Medieval armor and war-related artifacts that carry riddling boar images. This paper seeks to explore the nature of the boar image on several Medieval helmets including selected ship-burial helmets found at Vendel and Valsgärde in Sweden, the Benty Grange Helmet of England, and the infamous Sutton Hoo Helmet of England.
Al$_2$O$_3$/MgO ratios and discrimination function values typical of igneous rocks. Trace and rare-earth element data display nearly identical patterns and significant overlap, regardless of location. These observations, coupled with age and structural relationships allow the strain partitioning of a single granitic intrusion as permissible.

Harker diagrams show trends in bulk geochemistry. For example, major oxide concentrations show increases in the elements compatible with biotite. Since biotite abundance is a function of strain-ratio, the control on bulk chemistry is likely the intensity of deformation, rather than differing petrogenesis. Furthermore, trace and rare-earth element patterns are essentially identical, which is highly improbable if these rocks are derived from a separate source and process. These observations, coupled with age and structural relationships, allow the strain partitioning of a single granitic intrusion as permissible.

**PRESENTATION #86**

**Judith Ohochukwu**

Amanda M. Brouwer (Faculty Mentor)

Winona State University

*The Role of Resiliency in Stress and Coping Styles*

Format: Poster

Stress is a prevalent issue for college students and is correlated with worsened health and lower GPA. To deal with stress, college students use either adaptive or maladaptive coping strategies. Exploring the effects of resiliency on coping behaviors may help with the promotion of using more adaptive coping strategies to deal with stress. However, together, resiliency, stress, and coping are understudied. Therefore, the present study sought to examine the relationship among resiliency, stress, and coping strategies. Participants (N=236, M$_{age}$=19.62, SD=2.34) were emailed a survey and responded to demographic, stress, coping, and resiliency questions. The mediation effect of resiliency was tested using bootstrapping procedures. Resiliency was negatively correlated with maladaptive coping and stress and positively correlated with adaptive coping. There was a significant indirect effect of stress on adaptive coping styles through resiliency, b = -0.22, Bca CI [-0.34, -0.12]. This represents a medium effect, k$^2$ = .16, 95% Bca CI [.087, .2430]. There was not a significant indirect effect of resiliency on use of maladaptive coping styles. Findings indicate that resiliency is positively correlated with adaptive coping and negatively correlated with maladaptive coping. Resiliency mediated the relationship of stress on adaptive coping but did not change how stress was related to maladaptive coping. This implies that the more resilient an individual is, the greater the likelihood that they will use adaptive coping methods in response to stress. Future research should focus on ways to enhance resiliency so students can use more adaptive coping skills.

**PRESENTATION #87**

**Kyle Olsen**

David Higgins (Faculty Mentor)

English, Inver Hills Community College

*Children as Monsters are the Products of Society*

Format: Oral

For this paper we were to select a monster, whether real or fictional, and interpret the ways in which they represent cultural anxieties based on Jeffrey Jerome Cohen’s “Monster Culture; Seven Theses.” The monster I selected in is Alessa Gillespie from one of my favorite horror films Silent Hill. Some of my initial questions in selecting my monster were “What are the causes of Alessa becoming a monster?” As well as “How are these causes significant?” My ideas centralized around Alessa and the various types of abuse she was exposed to, including physical and sexual as well as how these different forms of abuse were the cause of her becoming a monster. Also a topic of interest was the target of her hatred. With this in mind, the goal of my research was to find evidence that supports development issues with children that are exposed to various types of abuse, specifically where aggression was concerned. Peer reviewed journals as well as a documentary provided reliable resources to help in verifying my thesis. During my research, I found a source that compared children to lumps of clay, with the idea that children are born without morals, knowledge, or any other sense of personality. This idea raises the question of whether or not a child is born with aggression or evil intent, or is it something that is developed through their experiences throughout early life. One thing I found in one of my sources is that although much more complicated than just being exposed to abuse, different forms of abuse make it more likely that a child would develop negative feelings toward abusers that could result in violence. Using this information as well as a few specific examples of children becoming violent, I was able to link real world examples of childhood acts of evil to similar types of events in Silent Hill. The purpose of this essay was to help show that what we think might be a monster, might actually be the result of monstrous acts. In this way, we as a society create our own monsters. As the years go on, we receive messages from many different sources and have access to different people than ever before. With this in mind, it is important to realize that children are developing all aspects of their personality and decision making, and so it is vitally important to ensure that their lives have structure and that measures are taken to prevent a loss of innocence and eliminate the potential for creating monsters out of children.
PRESENTATION #88

**Alix M. Overgard**
Thomas W. Nalli (Faculty Mentor) Department of Chemistry, Winona State University

*GC-MS Analysis of Phytosterol Content of Dried Mushrooms*
Format: Poster

The goal of this research was to determine the phytosterol content of dried mushrooms and compare the results to that previously reported by others for fresh mushrooms. Ergosterol is particularly important due to its role as a light-activated precursor of vitamin D2. Dried mushrooms (*Pleurotus ostreatus* and *Morchella*) were Soxhlet extracted with petroleum ether, saponified (1M NaOH in EtOH), extracted again with petroleum ether, dried over Na$_2$SO$_4$, and derivatized as TMS-ethers, which were analyzed by GC-MS.

Our results suggest similar sterol content for dried and fresh mushrooms. However, ergosterol was found to be significantly less abundant in dried mushrooms (oyster = 67%, morel = 19 ± 2%) than in fresh mushrooms (oyster = 84%, morel = 30-40%). An unknown sterol previously reported in fresh morel mushrooms was confirmed to be present in dried morels and identified as 24-methylenecholesterol. Preliminary results involve the analysis of dried porcini and black fungus mushrooms.

PRESENTATION #89

**Gilbert Penaherrera**
Derek Webb (Faculty Mentor)
Bemidji State University

*Pursuing the Saddle Point: Social Science vs. Natural Sciences*
Format: Oral

“Every day, whether or not it is obvious, we use strategy to make decisions. Turning these decisions into numerical values can allow us to take action in the most efficient manner. However, does the discipline a student studying play a roll in how much of a strategist they are? The purpose of this research is to test this hypothesis via simple non-zero sum matrix games and a simple questionnaire.

Subjects will answer demographic questions and then play an interactive computer game. Subjects will access the demographic questions using Google Survey and computer game, written in PHP, through a website hosted on the Computer Science Program server at Bemidji State University. The interactive game portion will be presented as a numerical matrix with given strategies denoted by letters A-D. The matrix will also hold at least one mathematical saddle point. The saddle point, or equilibrium point, is the point where the student participating gains the most while losing the least amount of points possible. The main objective of the research is see if there is a relationship between a student’s major in either the natural or social sciences and whether they can find the saddle point.”

PRESENTATION #90

**Kira Perez**
Jennifer L. Schultz (Faculty Mentor)
College of Management, Human Resource Management, Metropolitan State University

*Music in the Workplace*
Format: Poster

Listening to music at work is known to improve moods, reduce stress, increase focus, inspire, and support innovation, however research has provided scant evidence on the relationship between workplace music interventions and productivity. This research project looked at contextualized results of workplace personal music programs and found that playing music at work is best suited for jobs that are physically demanding, repetitive or isolated.
PRESENTATION #91
Daniel Perno
Lori Halverson-Wente (Faculty Mentor) Department of Communication, Rochester Community and Technical College

Intercultural Communication, Service Learning, and the Study of Poverty Abroad
Format: Oral

RCTC’s Cambodia Service Trip is a clear example of how service and learning converge to provide a comprehensive educational experience. The corresponding course examines intercultural communication and emphasizes learning through service while simultaneously immersing students in a foreign culture. Students spend two weeks abroad, living, learning, and serving within Cambodia before returning to the United States and applying their individual service projects to specific research about issues within Cambodia or intercultural communication in general. One of this year’s research projects featured in this presentation focused on poverty in Cambodia. Cambodia is a notable member in the realm of international development. While slowly recovering from the Khmer Rouge genocide Cambodia has received vast amounts of foreign aid from nations and international development agencies, been a subject of foreign economic investment, and a focus of many small non-profit charities. Although poverty is influenced by unique factors around the world, some factors are constant in fueling poverty and are evident in Cambodia, namely poor educational systems, rural and impoverished populations, and lack of economic mobility.

PRESENTATION #92
Anh Pham
Dorothy Wrigley (Faculty Mentor) Department of Biology, Minnesota State University, Mankato

Survival of Verminephrobacter in amputated worm tails
Format: Poster

Verminephrobacter is a genus of gram-negative bacteria that has been found in the nephridia of earthworms. The first species of this genus was identified and reported in 2008; however, there is a lack of information about its function. The earthworm Eisenia fetida transmits their nephridial symbiont, V. eiseniae from parent to offspring via cocoons. Previous work in the laboratory showed that regenerated nephridia no longer possess the bacteria. Only the head end of a caudal amputation regenerates a full tail. The tail end, severed from the neurologic system, only forms the wound plug. The amputated tail segments remain responsive to stimuli for several weeks. In this project, we examined whether symbionts could survive in the tail of the earthworms after amputation, or whether they need communication with the head end of the worm to survive. Tails of E. fetida were amputated and allowed to heal and maintained in culture. The tails were examined for the symbionts at the amputation and 3 weeks and 6 weeks later. The tails were stained using a fluorescent in situ hybridization method with Verminephrobacter-specific probe, Cys3-LSB 145. The results of staining 6 tails in day 0 showed the evidence of establishment of Verminephrobacter in the amputated tails. The results for the 3 and 6 weeks will be presented.

PRESENTATION #93
Angelina Pirozzoli and Madeline Podgorak
Maureen Gerson and Amy Reitmaier Koehler (Faculty Mentors) Department of Nursing, Winona State University, Winona

Palliative Care Knowledge and Self-Efficacy within a Baccalaureate Nursing Program: Phase 2
Format: Poster

Nurses and other healthcare professionals lack knowledge in effective end-of-life care. In addition, many baccalaureate nursing graduates agreed that their education was inadequate in preparing them for end-of-life care (Ferrell, Virani, Grant, Coyne, & Uman, 2000). Our study examined the progression of nursing students’ knowledge and self-efficacy in end-of-life care within a nursing program. Using a pretest-posttest design, data was collected at the start of their nursing courses and at two other points within the year. This is the second phase of this quantitative study; the first phase involved a different cohort of nursing students. The first phase of the study has been completed and participant knowledge and self-efficacy scores improved with statistical significance. Statistical analysis of the phase two data will be available at the time of the poster presentation. The significance of the study supports the need for ongoing education within a nursing program to promote student knowledge and self-efficacy in end-of-life care. Reinforcement of learning may help sustain these gains that may eventually improve patient outcomes. Recommendations for further study include the assessment of nursing graduates within this program to determine their level of satisfaction post-graduation with their end-of-life education.
PRESENTATION #94

Allison Rasmussen, Anthony Alexander and Meagan Schroeder
Rafael Narvaez (Faculty Mentor)
Department of Sociology, Winona State University
Media Usage and Learning Outcomes among Sociology Students
Format: Poster

The primary purpose of this study is to analyze the correlation between media use (e.g., Facebook, gaming systems, Netflix) and learning outcomes (e.g., GPA, student engagement). Numerous studies have shown both positive and negative effects of media use on learning outcomes (e.g., Kist, 2010; Yaros, 2012). Through the study conducted at Winona State University, we investigate the impact that technology has on students and their engagement in the educational process. Results might be used to direct WSU in development of digital monitoring.

Data for the study was collected by interviewing 48 Sociology students who were each paid $10 dollars for their participation. The purpose of payment was to lower the rate of refusals and raise the statistical power. An additional 40 students were interviewed to gather qualitative data concerning their college education expectations. 48 survey interviews were analyzed. Average GPA was 3.2 with a Standard Deviation of 0.4. Fourteen or 29% were male and 34 or 71% were female. Forty-two or 88% identified themselves as white, 3 or 6% identified as Hispanic, 2 or 4% identified as Asian, and 1 or 2% identified as black. The presentation will involve descriptive statistics, bivariate analysis (discussion of correlations between variables) as well as regression analysis. Other group of sociology students has submitted a similar proposal. Our discussion, however, will focus on different statistical analysis.

PRESENTATION #95

Austin Rau
Cynthia Miller (Faculty Mentor)
Department of Geography, Minnesota State University, Mankato
Minnesota and the Logistics of Bakken Crude Oil
Format: Poster

The extraction of Bakken crude oil in the Williston Basin of North Dakota is changing how petroleum is shipped. Before 2008, pipelines primarily moved North American oil from source regions to refineries along the Gulf Coast. Existing pipelines cannot accommodate huge volumes of oil from this previously low producing region. Lack of infrastructure and demand for “light tight oil” (LTO) led to the use of railroads as a way of moving the product to refineries across the nation. Transporting oil by rail over long distances was uncommon in past decades because of the high costs. This research examines how a new rail logistics system evolved over the past five years by mapping previously undisclosed routes used by major railroads that carry Bakken LTO and shows how Minnesota fits into the overall scheme of Bakken oil transportation. Safety issues resulting from the volatile nature of the product prompted the U.S. Department of Transportation to mandate the release of routing data to states affected, however some states refused to make it public. States such as Minnesota, California, Washington, and New York emerged as leaders addressing safety issues regarding the movement of Bakken LTO. By supplementing this information with locational data regarding spills and talking to experts—the results reveal a new pattern of crude oil movement to coastal areas of the nation with approximately 70% of Bakken oil going through Minnesota. Findings show Bakken LTO is increasingly routed to the Pacific Northwest and northeastern cities.

PRESENTATION #96

Jessica Reich
Alisa Eimen (Faculty Mentor)
Department of Art, Minnesota State University, Mankato
Monstrosity from the Medieval to the Renaissance
Format: Oral

Conventionally, art historians have noted a break in continuity between the Medieval and Renaissance periods; however current scholarship suggests that this division might have been exaggerated. Specifically within the realm of monstrosity, figures found in examples of architecture, such as Romanesque column capitals with lions and creatures with many heads, limbs, and wings; and also among two dimensional art, mainly Medieval manuscripts and Renaissance paintings in the late 1400s to the early 1500s. A style early in the Medieval period that came to be known as the animal-style, abstract images of beasts and birds that flowed in from interweaving lines, preceded the creatures found in monastic manuscripts and architecture. Debate among scholars as to the purpose of such figures within the religious context gives possible rationale for the use of the strange monsters in early Renaissance art, and to be precise, the strange, purposeful mutations of figures within Hieronymus Bosch’s Garden of Earthly Delights: Hell (right panel of the triptych)
PRESENTATION #97

Samantha Ritter
Frank Schindler (Faculty Mentor)
Chemistry Program
Emily Deaver & Thomas Dilley (Faculty Mentors)
Environmental Science Program
Southwest Minnesota State University

Evaluation of the intrinsic surface charge of a layered silicate soil
Format: Poster

Mining, manufacturing, and agricultural practices can add harmful metals to soil affecting groundwater, plants, and animals. The fate and bioavailability of heavy metals is dependent on adsorption sites of clays. The objective of this study was to determine and relate the permanent structural charge, $\sigma_o$, of a mixed-layer soil silicate to that of a reference montmorillonite. The mixed-layer silicate was fractionated from a Nicolette clay loam following removal of soluble salts, organic matter, and iron oxides. The $\sigma_o$ was determined by measuring outer- and inner-sphere complexation using the technique of Cs$^+$ adsorption. Cesium ion concentration was determined by atomic absorption spectroscopy with ionization suppression. The $\sigma_o$ of the Nicolette clay ($0.55 \text{ cmol}_c \text{ kg}^{-1} \pm 0.072$) was significantly higher ($P = 0.04$) than the reference montmorillonite ($0.28 \text{ cmol}_c \text{ kg}^{-1} \pm 0.064$). The Nicolette clay may contain higher tetrahedral charge and a propensity for adsorption of cationic species of lower hydration energy.

PRESENTATION #98

Allison Rogich
Heather Sklenicka (Faculty Mentor)
Chemistry, Rochester Community and Technical College

Exploration and Analysis of Lipid Content in Canine Food
Format: Poster

The goal of this project was to determine the amount of lipid content in canine food as well as its ability to prevent oxidative damage to DNA. A solvent extraction procedure was optimized to allow for isolation of fat from dry canine food. Initial photo-oxidation and gel electrophoresis were conducted to analyze if the lipids would prevent DNA damage. Results were inconclusive, thus a variety of oils listed in the ingredients for the food were tested to determine their ability to prevent photo-oxidative damage. Results of the isolation and preliminary DNA tests will be presented. Our conclusions provide evidence that fat is important to the nutritional and health status of a pet to prevent DNA damage and additional diseases.

PRESENTATION #99

Marten Salfer
Marianne Zarzana (Faculty Mentor)
Creative Writing Program, English Department, Southwest Minnesota State University

A Fantasy Farmer
Format: Oral

Some people write to express emotions and others to chronicle events. I write to explore new worlds and relive memories. Many different ideas are constantly bouncing around in my head. I like to let them out from time to time and see where I end up. Some of my favorite authors are Brent Weeks, Terry Brooks, and Jonathan Stroud. I like how lost I got in the worlds that they created. They are probably one of the major reasons that I chose to go for a Creative Writing degree. Writing fantasy stories has always been one of my goals and still is, though I usually write short poems about my life, specifically as a farmer. Part of that could be that I want to show people unfamiliar to farming life, what it actually entails. That way when I tell somebody that I was picking rocks all summer they don’t get a confused look on their face or pretend to know what I am talking about when they don’t have a clue. I write because, to me, life can be boring and the past is very important to me. Writing lets me do anything or go anywhere. It can bring people to far off places and go on adventures that they never would be able to even fathom doing in real life.

PRESENTATION #100

Kaley Scearcy and Megan Evert
Jeffrey W. Bell (Faculty Mentor)
Exercise Science Program, Southwest Minnesota State University

Functional Movement Screening in Active and Sedentary Men and Women
Format: Poster

Recently, the Functional Movement Screen (FMS) has gained popularity to detect injury likelihood based upon deficiencies in movement patterns. The goal of this 2x2 study was to assess movement patterns in men and women who are physically active or sedentary. The FMS test has 7 different movement patterns including deep squat, hurdle step, inline lunge, shoulder mobility, trunk stability, straight-leg raise and rotary stability. Each component is scored 0-3 with a maximum of 21. Thirty-two college-aged subjects (17 men, 15 women) completed all 7 tests. There was not a significant main effect of physical activity or sex on FMS total scores ($p=0.60$). Investigating the individual components, there were no differences in any tests between sedentary and active participants. However, there were differences between men and women for trunk stability ($\chi^2=12.7, p<0.01$) and inline lunge ($\chi^2=8.1, p<0.05$). There may be unique movement deficiencies between men and women that deserve further investigation.
PRESENTATION #101

**Johannah Scheu**  
*Elizabeth Kirchoff (Faculty Mentor)*  
Minnesota State University Moorhead  
*Student Ratings of Female Professors with Foreign-Accented Speech at Minnesota State University Moorhead*  
Format: Oral

Research has found that native speakers of American English are highly sensitive to foreign-accented speech (FAS), and in many cases attach value judgments to speakers on the basis of FAS. This research addresses the question, Does non-native accent in American English impact how students at Minnesota State University Moorhead (MSUM) rate a female professor’s academic competence? Participating students have listened to an English-language text recorded by four female speakers, two American English native speakers and two for whom Spanish is their native language. Students were asked to rate the speech samples, representing potential professors, for four criteria (friendly, serious, competent, cool). Only the measure of competence is assessed in this study. Of the 58 participants, 77.6% rated the non-native English speakers as having lower competence than the native-English speakers. By contrast, only 10.3% of participants gave higher ratings to the non-native speakers of English, suggesting that MSUM students do take foreign accented speech into account when assessing a female professor’s competence.

PRESENTATION #102

**Dustin Schulte**  
*Jeffrey W. Bell (Faculty Mentor)*  
Exercise Science Program, Southwest Minnesota State University  
*Differences in Health and Skill Related Physical Measurements Between Forwards and Backs on the SMSU Men's Rugby Team*  
Format: Poster

Rugby players use all three energy systems during a rugby match. This study sought to determine the differences in health- and skill-related physical fitness measurements between forwards and backs in a regional American university club program. Twenty subjects aged 20.90±1.93 performed 7 fitness tests including power, speed, agility, strength, aerobic power, muscular endurance, and reaction time. Forwards compared to backs were different in body mass (103.88±14.82 vs. 80.99±13.13 kg, p=0.002) and BMI (31.65±3.41 vs. 26.30±4.66 kg/m², p=0.009). Therefore, strength was analyzed based upon weight lifted normalized by body mass. There were no differences between forwards and backs in strength, muscular endurance, and reaction time. There were significant differences in speed (5.78±.32 vs 5.33±.23 seconds, p=0.002), agility (10.41±.64 vs. 9.73±.76 seconds, p=0.046), VO₂max (34.82±4.91 vs. 42.53±7.05 ml/kg/min, p=0.011) and power (1542.20±391.17 vs. 1232.10±221.51 Watts, p=0.043) between forwards and backs. The results indicate variable fitness abilities by rugby playing position.

PRESENTATION #103

**Ashley T. Shuck, Elizabeth C. Daniels, Alix M. Overgard and Reid L. Hein**  
*Myoung Lee (Faculty Mentor)*  
Department of Chemistry, Winona State University  
*Effect of Antidiabetic Agent Metformin and its Structural Analogs on the in vitro Glycation of Bovine Serum Albumin*  
Format: Poster

In addition to the antihyperglycemic effects, metformin has shown to inhibit glycation of proteins, protecting their structure and function in diabetes-associated complications. Formation of nonenzymatic advanced glycation end products was studied in the presence of antidiabetic agent metformin and its structural analogs: phenformin, buformin, guanidinobutyric acid, and aminoguanidine. Methyglyoxal (MGO) was used as the glycating agent while aminoguanidine was used as the known antiglycation agent. The rate and extent of fluorescence generated upon formation of the in vitro cross-linked bovine serum albumin (BSA) by MGO was studied using the excitation wavelength of 330 nm. The fluorescence emission spectra of cross-linked BSA gave maximum values at 410 – 430 nm, regardless of the inhibitor used. The fluorescence generation was measured at 410 nm over 96 hours at two concentrations of metformin and its analogs. At 10 mM MGO, no inhibition was exhibited and metformin and its structural analogs seemed to promote glycation. At 30 mM MGO, metformin (81%) and phenformin (93%) showed reduced glycation at 0.8 mM. At 30 mM MGO, buformin (51%), guanidinobutyric acid (69%), and metformin (94%) showed reduced glycation at 2.0 mM. At 100 mM, phenformin (86%) and metformin (84%) showed reduced glycation at 0.8 mM. At 100 mM, metformin (85%) was found to be the only drug to reduce glycation at 2.0 mM. Neither metformin nor its structural analogs proved to be as effective as aminoguanidine. The molecular weights of the cross-linked products determined by SDS PAGE indicated the formation of intramolecular cross-linked proteins in the presence of metformin and its structural analogs. SDS PAGE also confirmed that metformin and its analogs studied here were not potent antiglycation agents in vitro.
For my research project, I have chosen to examine an astounding novel by Eliezer Wiesel titled Night. The book is a memoir for young Ellie himself as the main character as he fights to stay a life in the Concentration Camps during the Holocaust. It’s about a 12 year old Jew boy who, despite the hatred and abundance of society, overcomes the inevitable not only to survive but to survive with his human side still intact. Throughout the novel, Ellie loses not only his faith in self-worth but also his faith in god and humanity as a whole. My project explores the particular American hopes and fears reflected in Night, because I truly feel like the world had hesitated to rescue the Jews and society covered their ears and eyes on what was happening then blinding themselves from the truth. During the Holocaust, what was the rest of the world doing when the first family of Jews were taken from their home in agony? Had they not heard or seen all the Jew blood splatter? In order to explore these cultural hopes and fears, I have found sources that I agreed or disagreed with as to where the rest of world was during the Holocaust. In one of the sources that I found, the author endorses that most of the world did not know about what Hitler was doing. Many people simply weren’t aware of it. The people with the many knew. For instance, in that same article, the author corroborates that the media was at fault during the Holocaust. They turned a blind eye and gave Hitler a freebee. This cost so many lives because it hindered the real truth from coming to the rest of the world. By the time the world started opening their eyes the truth, billions and billions of innocent lives have been taken. I will use scholarly sources to prove my claim and research. My research causes me to believe that this work of literature shows that Americans are unaware of the truth beyond “the truth” that the media provides. The media fabricates the truth and makes it fit however it fits right. The world was not gone or deaf by the birth of the Holocaust. It was simply not aware of it because the media had fabricated it and blinded the world with their truths. At the same time, Americans are also hopeful that perhaps even with hatred in this world, humanity will somehow grow overcome all. That perhaps someday everyone will see the truth in their eyes and not a fabricated version of the media. This research is important because from the genocidal murdering of the Palestinians in Gaza, to Ferguson, and even to the Chapel Hill shooting, the media had fabricated and covered each truth a different way. Ferguson was followed by many other “unfortunate incidents”, as the media called it and it will only continue happening if the media keeps labeling it as unfortunate incidents. It’s the Holocaust all over again. This time the media is stronger than ever and if we don’t turn away from these fabrications and cover ups, history will repeat itself. Except this time, it will not repent. It will be the end of humanity and the good in the world as we know it.
pikes were measured from each sample. Peak spawn date was estimated to be 28 April based on the catch rate of adult northern pike caught in Fyke nets. Larval northern pike were observed in the first sample day and the peak occurred on 29 May (0.87 fish/m²), by 3 June larval migration had subsided. From peak spawn to peak migration, 31 days passed. This can be used as an estimate of the time needed to complete the reproduction process from fertilization to larval migration. During daylight hours of the sampling period, an estimated 38 million (5.5-73.4 million 95% CI) larval pike drifted down the river. The average length of larval northern pike increased 1 mm (0.7-1.3 95% CI) per day throughout the study (p=0.001).

PRESENTATION #107
Olaf Summers and Briana Bruske
Chemistry, Rochester Community and Technical College
Toward a comprehensive integration of calorimetry across the curriculum
Format: Poster

Student comments indicate that calorimetry is one of the most difficult labs currently in our General Chemistry sequence. Research was focused on developing a multi-week laboratory experiment for General Chemistry students to study and explore various aspects of calorimetry. The goal was to replace the current one-week calorimetry lab with a two-week lab allowing students to better process and understand the techniques of calorimetry.

In addition to the General Chemistry lab we have been able to add the concept of constant volume calorimetry to the allied health General, Organic, and Biological Chemistry course. Students have traditionally only used constant pressure calorimetry to measure the heat liberated from a burning nut. To include constant volume calorimetry, a video was produced showing the use of the bomb calorimeter and the data for burning the nut. By burning food in both calorimeters and determining the total calories obtained from each, students will be able to learn the differences in accuracy for each type. To further cement the concept of heat transfer, an inquiry lab related to heat transfer was developed for students to understand how different container materials insulate a system from its surroundings.

Analysis of student synthesized biodiesel and other organic samples allows the concept of calorimetry to be continued in the Organic Chemistry sequences, which helps validate its usefulness as an analytical tool. By bringing constant volume calorimetry into a variety of classes we can improve students' understanding of heat transfer and analytical tools for measuring this transfer.
to “new” responders which ranged from 19%-23% for the 4 larger cities. We got no responses from the 4 smaller suburbs. More repeat responders had a positive attitude toward turkeys (26/37=70%) than did new responders (35/70=50%). Our poster will give more survey results.

PRESENTATION #112

Julie Velasquez
David Higgins (Faculty Mentor)
English, Inver Hills Community College
Money and Social Class in Titanic and The Purge
Format: Oral

In my English class, I am working on a research paper in which I will analyze how a specific work of American Literature reflects fears and hopes during a representative cultural moment. The work I choose is Titanic, the film. My central inquiry question is “If you were to put yourself in a class depending in your financial income where would you put yourself?”. I will highlight and analyse the main characters of the story. I will state what the film wanted to communicate and compared it with secondary sources to end up with my own analysis. I will use another film, The Purge (2014) as a secondary source. I want to talk about how it is represented in the cultural moment. I will use another secondary source to explain the economic and political view in that specific set of time. In doing a literary analysis, it is important to see the larger issue expressed by the historical moment the primary text takes place. For example, the development of open minded individuals in the 18th century is reflected in the Titanic. I believe that my research is important because it is about an issue that has transcended through times.

PRESENTATION #113

Amanda Weiss and Melissa Kohout
Maija Sipola (Faculty Mentor)
Department of Geology, Minnesota State University, Mankato
XRF Geochemical Analysis of the Ngandong Paleoanthropological Site in Java, Indonesia
Format: Poster

The Ngandong palaeoanthropological site in Central Java, Indonesia is located on a terrace above the Solo River and has produced fourteen Homo erectus fossils that, based on morphology, appear to be examples of recently-living Homo erectus. There is great interest in the age of these fossils, but efforts to date them directly have not been successful, and little is known about their stratigraphic context or the source of the sediments that contain them. Mineralogical and geochemical characterization of the Ngandong site stratigraphy can provide some insight into the processes that formed the site, as well as the source of the sediments. Previous geochemical analyses of bulk sediment samples using portable X-ray fluorescence (pXRF) methods showed little variability within the site stratigraphy. This study applies a higher-resolution geochemical method (standard X-ray fluorescence) to these fossil-bearing deposits to better characterize the sediments and differentiate source rock types within the Solo River drainage system. Twenty sand samples from Ngandong were milled, prepared into pellets, and analyzed with a Rigaku Supermini200 XRF instrument. These geochemical data provide a high-resolution characterization of the Ngandong site stratigraphy and thereby improve our understanding of the Solo River paleoflow dynamics and depositional history.

PRESENTATION #114

William White and Dominic Tunison
Kuldeep Agarwal and Winston Sealy (Faculty Mentors)
Department of Manufacturing Engineering Technology, Minnesota State University, Mankato
Low Cost Welding based Metal 3d Printer
Format: Poster

3D Printing is one of the most innovative and latest manufacturing process in the last decade. This technology has changed the way we think about manufacturing and can be used for various day to day items. There are numerous low cost 3D printing machines available today. Most of these machines can make parts out of plastics like ABS, Nylon or PLA. While the parts created from these printers can be used for many purposes, these fail when there is a need for a metal part. The current metal based machines are very expensive and cannot be used in small settings. The aim of this research is to develop a low cost metal 3D Printer. An open source design is used to manufacture the printer using a traditional MIG welding system. The printer is capable of printing simple shapes and geometries. We used an existing design of a similar printer in this research and modified it to improve the deposition rate and the resolution. We hope that this will enhance the distribution of these printers on a small scale and spur up innovation in this domain too.

PRESENTATION #115

Jessica Wiswell and Nicole Thompson
Kevin Filter (Faculty Mentor)
Department of Psychology
Minnesota State University, Mankato
Comparing the Reliability and Sensitivity of Observational Systems for Positive Behavior
Format: Oral

To better understand the effectiveness of educational interventions that are used in many k-12 school districts, such as Positive Behavior Interventions and Support (PBIS), it is important that the behavioral observation methods used are efficient. As the name suggest, PBIS aims to not only extinguish problem behaviors, but to also increase positive social behavior. In order to determine an observation system
that is reliable and sensitive to measure the possible increase of positive behavior, this study was conducted using three different observation methods: Partial Interval, Frequency, and Duration. These methods were also used on two different levels: watching the class as a whole group vs. watching the class student by student, the latter involving a rotation of focusing on each individual for an interval of 10 seconds. To test for both the interrater reliability of and the sensitivity to these low-frequency behaviors, these six conditions are tested against each other as well as themselves. During each observation, two researchers studied a classroom of 18 preschoolers (four and five years of age) at the Children’s House at Minnesota State University, Mankato’s campus, using a previously created measure (SHUCK scale) of positive behavior. By completing all the required hours of observation, the outcome should result in an observational system that is both sensitive to the occurrence of positive behaviors and reliable. These findings can help guide future studies of positive social behavior in groups to use the best possible measure of observation system.

PRESENTATION #116

Jane White
Jill Stackhouse (Faculty Mentor)
Bemidji State University

Labor Exploitation in Juarez, Mexico: Gender Issues in the Maquiladoras
Format: Oral

In the 1990’s, NAFTA made it more profitable for American companies to import parts for assembly in the Mexican Maquilas (manufacturing zones). By ratcheting down employee organizational strength, they have been able to exploit laborers. The women working in Maquilas are a uniquely exploited demographic, and make up the majority of the workers. Textile industries are considered “women’s work” and they accept low wages and poor working conditions since few options are available to unskilled workers. While everyone in Juarez fears the drug lords, women in Juarez are legitimately concerned that they will be sold into the sex trade or forced into drug smuggling. Workers are considered expendable, and women can be fired if they are pregnant or injured on the job. After being fired and forced to walk home alone, hundreds of women have been found raped and murdered in the fields and along the dirt roads that they must travel to and from the Maquilas.
PRESENTATION #118

John Zehnder
Adriana Gordillo (Faculty Mentor) Department of World Languages
Minnesota State University, Mankato
The Garden of Forking Opinions: Lugones and Borges on Science
Format: Oral

Latin American Literature has produced a number of famous authors in the genre of the fantastic. Among the most notable are the Argentine writers Leopoldo Lugones and Jorge Luis Borges. While both of these literary luminaries dealt with advances in science and technology throughout their work, they diverged greatly with regard to their opinion about the role that science should play in society. While Lugones considered scientific progress to a grave threat to the moral fabric and well-being of society, Borges believed that scientific theories underpin and intersect with a variety of different experiences and thus can serve as tools to explore human perception of reality. A textual analysis of two short stories clearly illustrates these stark differences. The opinion of Lugones is evident in the short story, “Viola acherontia” (“The Acherontia Violet”) while that of Borges is well-defined in “El libro de arena” (“The Book of Sand”). In the end, Borges’ treatment of science proves quite versatile and in contrast to Lugones’ fears, has helped lead the way to solutions to problems facing modern society.

PRESENTATION #119

Douglas Zentner
Andrew Hafs (Faculty Member)
Bemidji State University
A Genetic Based Approach to Management and Stocking of Muskellunge
Format: Oral

Fish stocking has long been used as a management tool among fisheries biologists and continues to be met with popular public opinion. Despite perceived simplicity, full effects of stocking remain cryptic for fish populations. Coupled with other management practices the Minnesota Department of Natural Resources (MNDNR) has established Minnesota as a premier muskellunge (Esox masquinongy) fishery. From 1958 to 2012 the MNDNR stocked three muskellunge strains in Big Mantrap Lake, MN. Fish from Shoepack Lake, MN were used until the realization that fish were not attaining sizes sought after by anglers. The MNDNR then made a statewide switch to Wisconsin strain before developing a source from Leech Lake, MN. Using 13 microsatellite markers, genetic contributions of source populations were estimated from samples taken between 1984 and 2013. Analysis of current and past genetic makeup of Big Mantrap Lake demonstrated a successful dilution of the Shoepack-strain from 96% in 1984 to 11% in 2013 as the Leech-strain made up 85% of the 2013 sample. This study reinforces the use of genetic information as a management tool in evaluating ancestry of stocked fish. These findings will help the MNDNR make management decisions related to size structure and genetic makeup of muskellunge populations.

PRESENTATION #120

Pengyu Qian
Eduardo Pablo (Faculty Mentor)
Minnesota State University Moorhead
Country Risk and its Effects on Institutional Investment Fund Flows: Evidence from Mexico
Format: Poster

This study analyzes a sample of 14,445 observations where funds invest in Mexican companies. Preliminary results show that investment funds react not only to economic, but also to political events. Specifically, I study the reaction of investment fund flows to the announcement of (1) presidential results in July 1st, 2012, (2) Energy Reform that took place in December 11th, 2013, and finally, (3) the disappearance of 43 students in the area of Iguala, Guerrero State, Mexico at the end of September 2014. Comparing samples before and after the events, one of the political events that had the most effect on investment flows was the disappearance of the 43 students in Iguala. On average, investment funds decreased exposure to Mexico by 2.6 percent and US-based funds by 0.27 percent. Although the magnitude is different, both decreases are statically significant at a 1 percent level. But US-based companies seem to adjust the exposure back to previous levels three months after the event. This evidence suggests that investment firms based in different countries react differently to country-risk events.

PRESENTATION #121

Pratik Dahal
Damiano Fulghesu (Faculty Mentor)
Minnesota State University Moorhead
The Isoperimetric Inequality
Format: Oral

The generalized Dido problem is considered. The problem deals with the classical isoperimetric inequality which is explained using concepts from Calculus of Variations. The proof will show that the equality is unique to a circle. Moreover, the problem is generalized to curves in a sphere.
Mapping elementary complex-valued functions are more intricate than real-valued functions because these functions are not one-to-one. One way of visualizing the elementary complex-valued functions is to use Riemann surface. However, the formal way of approaching Riemann surfaces is always beyond the scope of complex analysis classes for undergraduates. Especially it is difficult for those undergraduate students without background in topology to understand Riemann Surfaces. Nevertheless, Riemann surfaces of elementary complex-valued functions can be captured using an informal approach. The purpose of this research is to demonstrate different ways of producing Riemann surfaces using the programming language C++ for different elementary complex functions like \( f(z) = z^n \), \( f(z) = e^z \), \( f(z) = \ln z \), \( f(z) = \sin z \), \( f(z) = \cos z \), etc. based on their properties and periodicities.