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*16th Annual Symposium
in
Science Education*

Bozeman, MT

June 30th - July 5, 2014

Reid Hall 101 & 102

Master of Science in Science Education

2014

Montana State University



www.montana.edu/msse

MSU - Bozeman
401 Linfield Hall
Bozeman, MT 59717



Intercollege Programs for Science Education/ MSSE Program

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Associate Director
Lead Program Faculty
Program Officers

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Diana Paterson
John Graves
Amanda Lipsey & Holly Thompson

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History

Master of Science in Science Education Program

In May, 1996, the Montana Board of Regents of Higher Education approved a new degree, the Master of Science in Science Education (MSSE), designed for science educators interested in graduate study while remaining employed. It is unusual in two important ways. First, it is an intercollege, interdisciplinary effort. Four colleges, the Graduate School, and fourteen departments collaborate to offer this innovative degree. Second, about 80% of the courses and credits needed to complete the degree are offered by distance learning in structured interactive courses using asynchronous, computer mediated instruction. The National Teacher Enhancement Network (NTEN) project, a National Science Foundation grant project, funded since 1992, developed and offers many of the distance learning courses for this degree program. The Burns Telecommunication Center, Extended University, provides technical and logistical support. In addition to completing core courses in education, those seeking the degree develop interdisciplinary combinations of science courses from offerings in biology, chemistry, earth science, ecology, microbiology, physics, plant science, and other science content areas. All graduates complete a science education capstone project in their final year.

Norm Reed, Coordinator 1996 to 1998, artfully handled admissions for the first two cohorts, oversaw design and development of core classes, and overall implementation of the program. In 1997, 30 teachers enrolled in six classes offered in the first campus summer session. In comparison, this summer, close to 400 teachers are enrolled in approximately 45 campus and distance courses.

Carol Thoresen, Coordinator 1999 to 2007, grew the programs from 25 to about 60 admissions per year. Larger enrollment allowed for a wider variety of science course offerings. Carol worked with leading instructors and researchers to develop over 25 new program courses, some with very innovative modes of delivery.

Peggy Taylor is the current Director of MSSE. She assumed her position in January of 2008. As a graduate of the program's first cohort, she brings a unique perspective to its administration. Her contributions include expansion of the program's targeted populations, strengthening the program's framework through continuous evaluation processes, and growing program admissions to close to 100 per year.

Diana Paterson, Associate Director, joined the program in 2002. She provides critical recruiting and advising support to off-campus graduate students. Diana skillfully manages the MSSE office and staff. Students lovingly refer to her as the "glue" that holds them together through challenging times.

John Graves, Lead Program Faculty, has been a core MSSE instructor since 2003. He assumed his duties as Lead Program Faculty in 2009. In addition to his instructional responsibilities, John provides guidance and mentoring for MSSE faculty, participates in various outreach activities, and serves as liaison between the MSSE office and MSSE instructors.



MSSE Capstone Project

Each Master of Science in Science Education (MSSE) student, with the cooperation of her or his graduate committee, identifies and completes a science education capstone project. Each project is designed to provide experience and information that aids our understanding of science teaching-learning or science curriculum. The capstone project topic is generally identified during the first year of the student's graduate program. A student begins the project, which generally relates to science education in the MSSE student's educational setting, in the fall of the final year by submitting a proposal to his/her advisor. The results of each student's project are summarized in a written, professional paper completed and presented in the student's final summer session.

The MSSE Steering Committee, faculty, and staff congratulate these deserving graduate students for their persistence to pursue a graduate degree, while continuing full-time employment as science educators.

2014 Capstone Project Advisors

Chris Bahn, Chemistry/Biochemistry

Ritchie Boyd, Academic Technology Specialist

Joseph Bradshaw, Biology

Lisa Brown, Extended University

Eric Brunsell, Science Education

Greg Francis, Physics

Irene Grimberg, Physics, Cell Biology & Neuroscience

John Graves, Science Education

Ron Hellings, Physics

Steve Holmgren, Chemistry & Biochemistry

Jerry Johnson, Political Science

Susan Kelly, Land Resources and Environmental Sciences

Amber Kirkpatrick, Land Resources & Environmental Sciences

Robyn Klein, Plant Sciences

Dave Lageson, Earth Sciences

Nicholas Lux, Education

Stephanie McGinnis, Land Resources & Environmental Sciences

Tom McMahan, Ecology

Terrill Paterson, Ecology

Elinor Pulcini, Microbiology

Jewel Reuter, Science Education

Jay Rotella, Ecology

Jim Schmitt, Earth Sciences

Angie Sower, Chemistry & Biochemistry

Dave Varricchio, Earth Sciences

Amy Washtak, Chemistry & Biochemistry

Angie Weikert, Museum of the Rockies

John Winnie, Ecology

Walt Woolbaugh, Science Education

LeAnn Yenny, Mathematics Education

Off-Campus Advisors

Beth Covitt, University of Montana

Charles M. Crisafulli, US Forest Service, Pacific Northwest Research Station, Olympia, WA

Sean Griffin, Earth Sciences, NOAA

James L. Hayward, Andrews University, Berrien Springs, MI

Paul S. Hardersen, University of North Dakota

René Fester Kratz, Everett Community College, Everett, WA

Gerald Nelson, Casper College, Casper, WY

Jason Marcks, Aerospace Consultant, WI

Cherie McKeever, Montana State University Great Falls

Gregory Reinemer, Physics

Suzanna Soileau, Outreach Coordinator, USGS Northern Rocky Mountain Science Center, Bozeman, MT

Jeff Warren, US Fish & Wildlife Service, Red Rocks Lakes National Wildlife Refuge, Lima, MT

2014 Science Education Symposium Presenters

Joshua Abernethy
Asheboro, North Carolina

Deanna Emberley Bailey
Huntington, Vermont

Mariann Ambrose Bernard
Escondido, California

Marcia Blome
Omaha, Nebraska

James P. Bratka
Gahanna, Ohio

Dean Brown
Medicine Hat, Alberta, CA

Cameron R. Burns
Spokane, Washington

Joshua Caditz
Carpenteria, California

Irene Catlin
Portland, Oregon

Matthew Clay
Webb City, Missouri

Kara Lee Coates
Spring Creek, Nevada

Justi Crofutt
Pinedale, Wyoming

John Henry Davis
Asheville, North Carolina

Coreen Ann Dinger
Lufkin, Texas

Rebecca Love Dobson
Kinsman, Ohio

David Dooling Jr.
Alamogordo, New Mexico

Daniel DuBrow
Chicago, Illinois

Chance Duncan
Dardanelle, Arkansas

Camilla Dawn Dusenberry
Helena, Montana

Stephanie B. Fields
Ocean City, New Jersey

Shari Generaux
Oakland, California

Elaine Gibbs
Valrico, Florida

Sara Danielle Grotbo
Helena, Montana

Lily Guajardo
Cedar Park, Texas

Matthew Phillip Haack
Wilmington, Delaware

Jacquelyn Haas
West Bend, Wyoming

Jennifer Heisler
Kent, Ohio

Kyle Herdina
Winona, Minnesota

Analea Hronek
Red Lodge, Montana

William Iliff
Sacramento, California

Angie Jenkins
Independence, Iowa

Heidi Kirsten Jessen
Yuma, Arizona

Christine Jones
Vancouver, Washington

Alecia Jongeward
Bozeman, Montana

Carisa E. Ketchen
Kalispell, Montana

Katherine C. Koessler
Maplewood, Minnesota

Terina Konrad
Heyburn, Idaho

Donald Christopher Koper
Reading, Pennsylvania

Marka Latif
Bozeman, Montana

Scott Lilley
New Canaan, Connecticut

Tanya Long
El Cajon, California

Quincie R. Lords
Belt, Montana

Nicolai Love
Jackson, Missouri

Lisa Lundgren
Gainesville, Florida

Robert Lynch
Edgewater Park, New Jersey

Logan D. Mannix
Helena, Montana

Krista Martens
West Glacier, Montana

Matthew McClellan
Lake Charles, Louisiana

Doralee McCormick
Cincinnati, Ohio

Ashley Cathryn McGrath
Helena, Montana

Casey S. McHugh
Missoula, Montana

Candace Marie McMullan
Fishers, Indiana

Dawn Mercer Turner
Huntsville, Alabama

Mark H. Meredith
Dardanelle, Arkansas

Mary Mingles
Somerset, Maine

Heather Mitchell
Houlton, Maine

Stephen Mohr
Austintown, Ohio

Jeffrey J. Noblejas
Oakland, California

Eric Todd Ojala
Lolo, Montana

Sherry Otruba
Roanoke, Virginia

Kal Pokley
Port Austin, Michigan

Michael Poser
Hobson, Montana

Lynn Powers
Bozeman, Montana

Katie Redmond
Chicago, Illinois

Randy Zane Rowland
Sheridan, Wyoming

Pamela J. Schaefer
Morris County, New Jersey

Christina Anne Scott
Gold Bar, Washington

Kaylee Christine Shaw
Kalispell, Montana

Ahmed Shawli
Bozeman, Montana

Carol Lee Smith
Van Alstyne, Texas

Jennifer Anne Smith
Colorado Springs, Colorado

Garold Sumner
River Falls, Wisconsin

Michael H. Tang
Irvine, California

Melissa Elyse Thompson-Krug
Blue Eye, Missouri

LeAnn Thongvanh
Des Moines, Iowa

Rachel Tinkler
New Berlin, Wisconsin

Donna Raquel Tully
Kanéohe, Hawaii

Jessica Louise Radl Vasquez
Cedar Rapids, Iowa

Christina L. Wallace
Thornfield, Missouri

Jocelyn Wells
Saint John, New Brunswick, CA

Clinton Whitmer
Poplar, Montana

Summer 2014 MSSE Science Education Symposium Presentations

Monday, June 30, 2014

9 am Lynn Powers Reid 101
Bozeman, Montana
Bozeman High School

Facilitator: Krista Martens

Impact of Authentic Astronomical Research on Astronomy Club Students - The Bozeman High School Astronomy Club was used to look at the impacts of conducting authentic astronomical research through participation in several projects. Students were given opportunities to learn about real world science and develop new skills. Students worked with scientists and principal investigators from different NASA missions through various Citizen Science research projects using varied methods. The results indicated that student interest and participation in Astronomy Club greatly increased.

9 am Tanya Long Reid 102
El Cajon, California
Literacy First Charter School

Facilitator: Nicolai Love

Effects of the Claims-Evidence-Reasoning Writing Framework on Teaching and Learning in Eighth Grade Science - Students in an eighth grade science class learned the Claims-Evidence-Reasoning (C-E-R) writing framework to write evidence based scientific explanations. The framework was used with a variety of lesson types in astronomy and chemistry. Students reported using the framework helped them learn science content. The C-E-R framework also improved students' understanding of the nature of science.

10 am Irene Catlin Reid 101
Amboy, Washington
Mount St. Helens National Volcanic Monument

Facilitator: Michael H. Tang

Pond Breeding Amphibian Assemblages of the Pumice Plain at Mount St. Helens- 33 Years Post-Eruption - Thirty-three years post-eruption, the Pumice Plain has evolved from a relatively hostile matrix to an environment that contains a network of patchily distributed habitats suitable for amphibians. Surveys were conducted to obtain base-line data on how amphibian populations respond to natural habitat disturbances. Presence, breeding, larval abundances, richness, and biophysical variables among habitats were analyzed. Species documented during summer surveys of 2013 are *Rana cascadae*, *Pseudacris regilla*, *Anaxyrus boreas*, *Ambystoma gracile* and *Rana aurora*.

10 am Camilla Dusenberry Reid 102
Helena, Montana
Radley Elementary School

Facilitator: Candace McMullan

The Impact of Visual Representation on Students Learning of, and Attitude towards Science Vocabulary - This action research project was designed to test if strengthening a word's meaning by increasing exposure time through visual representation would allow for comprehension of the overall concept to follow. It also takes a look at the affects visual representation has on a child's attitude towards vocabulary. Results of the study indicate there was not significant growth between the treatment unit and the non-treatment unit.

11 am Jennifer Smith Reid 101
Colorado Springs, Colorado
The Classical Academy High School

Facilitator: Coreen Dingler

A Classical Approach to Science: Socratic Seminars and Data Analysis and Interpretation - Socratic seminars were implemented in four chemistry classes for the purpose of promoting data analysis and interpretation. Students engaged in four separate seminars using a set of data as their text. Results of the study indicate improved student confidence and frequency and value of scientific communication. However, the results reveal little or no change in achievement with relation to data analysis and interpretation.

Monday, June 30, 2014

11 am Jeffrey Noblejas Reid 102
San Francisco, California
St. Ignatius College Preparatory

Facilitator: David Dooling

The Effectiveness of Conceptual and Quantitative Formative Assessments in the High School Physics Curriculum - This study attempted to determine the effects of formative assessments in a flipped curriculum physics classroom. It also attempted to determine whether the type of formative assessment, conceptual or quantitative, makes a difference in the outcome. The data showed that overall performance on the formative assessments does not correlate well with summative assessment performance. However, the type of formative assessment given, interestingly, does seem to make a difference.

12 pm Joshua Abernathy Reid 101
Raleigh, North Carolina
Wake Young Men's Leadership Academy

Facilitator: Angie Jenkins

The Effects of Student Writing on Student Learning of Eighth Grade Science Concepts - This study investigated the effect of writing on student learning, long-term memory, problem solving skills, and motivation. The study also investigated teacher motivation. The students reflected through writing in participation logs, student indicator logs, and other writing activities. The results showed improvements in students' long-term memory, problem solving skills, students' outlook on peer editing, and the teachers' attitude towards teaching science.

12 pm Daniel DuBrow Reid 102
Evanston, Illinois
Evanston Township High School

Facilitator: Matthew McClellan

Enhancing the Flipped Physics Classroom Through the use of Preflight Questions - My students appeared to have difficulty connecting the content they learned from my video lectures to their assignments. To address this, I created several "preflights", which students completed after watching videos. I wanted to determine the impact of preflights on learning and to see which format of preflights were most effective. I found that preflights had a positive effect on learning, and that students preferred a guided tutorial format.

1 pm Quincie Lords Reid 101
Great Falls, Montana
Great Falls College - MSU

Facilitator: Kara Coates

The Effects of Explicitly Teaching Metacognitive Techniques in a College Level Human Biology Class - The success rate for Basic Human Biology at Great Falls College MSU has been declining the last three years. While reflecting on possible reasons for the decline I narrowed it down to the most common reasons for students coming to see me. These included difficulty with note taking, time management and learning from errors. This project evaluated the effect of teaching metacognitive strategies on academic performance, self-efficacy, and ability to select appropriate metacognitive strategies. Students were taught time management and study strategies along with reflection activities. Data collection for this project included surveys, interviews, field notes, and exam scores. The results indicated that note taking, study skills and time management improved. Self-efficacy remained the same while academic performance results were inconclusive. The positive outcomes from this project have encouraged me to continue implementing these strategies.

1 pm Lily Guajardo Reid 102
Fort Worth, Texas
Texas Medical Association

Facilitator: Christine Jones

The Informal Classroom: Evaluating the Effects of a Continuing Medical Education Program on Science Learning and Attitudes in Medical Students, Residents and Physicians - Continuing medical education programs play an important role in disseminating current scientific information to our medical community adult learners. This research study evaluated the effects of our education programs on science learning and attitudes, observed preferred learning environments and adult learning theories, and analyzed our evaluation and assessment process. The data revealed that learning method preference depends on educational content, and successful programs adhere to that preference.

Monday, June 30, 2014

2 pm Randy Rowland Reid 101
 Sheridan, Wyoming
 Sheridan High School

Facilitator: Cameron Burns

Effects of Incorporating Selected Next Generation Science Standard Practices on Student Motivation and Understanding of Biology Content - This study investigated how incorporation of selected Next Generation Science Standards practices; developing and using models, using mathematics and computational thinking, and engaging in argument from evidence affected student understanding of concepts and engagement and motivation in studying bacteria, molecular genetics, and Mendelian genetics. The results showed improvement in student conceptual understanding, student motivation and engagement, and also improvement in the instructor's engagement and motivation.

2 pm Deanna Bailey Reid 102
 Barre, Vermont
 Barre Supervisory Union

Facilitator: Logan Mannix

The Effect of Professional Development in Science and Literacy - I co-taught an 11-week professional development course to elementary school teachers to help them weave student talk and notebook writing into science instruction and thereby help their students to reason about the natural phenomena they experience during science inquiry. Research showed that this course helped increase teachers' knowledge-base and self-efficacy for teaching science using literacy strategies. Teachers' classroom implementation of best practices for science teaching through inquiry changed dramatically too.

3 pm Michael Poser Reid 101
 McCook, Nebraska Hobson, Montana
 McCook High School Hobson Public Schools

Facilitator: Katie Redmond

Challenges of Utilizing Tablet Computers for Instruction in the Middle Level Science Classroom - This project examined impacts of tablet computers in middle level classrooms. It was found that teacher preparation time increased and teachers needed more professional development. Concerns over misuse drove district policy and led to restricted access to the tablets. The staff and students valued the tablets and there will be a re-evaluation of district policy and professional development practices to better suit the needs of the district.

3 pm Christine Scott Reid 102
 Snohomish, Washington
 Glacier Peak High School

Facilitator: Chance Duncan

Using Real-World Applications to Enhance Learning in a High School Biology Classroom - In this investigation, real world applications were used to enhance the academic success and motivation of students in a high school biology class. During the process, student surveys, assignments and assessments were used as measuring tools. Teacher motivation was also evaluated throughout the process. In the end, the use of real world applications had encouraging impacts on students' academic success and both teacher and students noted an increase in motivation.

5 pm Ahmed Shawli Reid 101
 Bozeman, Montana
 Montana State University

Facilitator: Marka Latif

The Effect of Using the Weekly Podcasts on Students Learning - In this project, the effect of flipping the classroom by the use of videocasts was studied to measure its effectiveness on student learning outcomes compared to the traditional classroom. Also the effect of increasing the number of videos per week on students' learning was studied. To accomplish the objectives of the project, the class was divided into three periods: no video period, one video a week period and two videos a week period. The data revealed that students scored higher in the one video period in both teacher made assessments and weekly online quizzes. Also, increasing the number of the videos to two did not show any increase neither in the teacher made assessments nor the online quizzes result. Overall, students reported positive feedback regarding using the flipped classroom approach and the results showed that they preferred it to the no videos period, the traditional approach.

Tuesday, July 1, 2014

7 am Sherry Otruba Reid 101
Roanoke, Virginia
Roanoke Valley Governor's School

Facilitator: Ashley McGrath

The Effects of Screen Casting on the Mastery of High School Chemistry Concepts and Differentiation of Instruction - The purpose of this study was to examine the effects of using screen casting of video lessons as homework followed by active learning strategies in class, flipping the traditional high school chemistry classroom. Results of the study did not indicate improvement in the understanding of chemistry concepts, but did provide evidence of improved differentiation of instruction.

8 am LeAnn Thongvanh Reid 101
West Des Moines, Iowa
Indian Hills Jr. High

Facilitator: Rebecca Dobson

A New Way to Read: Will Implementing Literacy Strategies in the Science Classroom Increase Motivation and Understanding - Wanting to refresh the routine of reading text and filling in worksheets, I developed a process called Question, Read, Connect, Reflect as a way to get seventh grade science students engaged and motivated to understand content. Students worked cooperatively to read sections of the science textbook, constructing concept webs and summaries for each section. While effort and motivation increased, no gains were shown in their writing or summarizing abilities.

8 am Scott Lilley Reid 102
New Canaan, Connecticut
New Canaan Country School

Facilitator: Pamela Schaefer

Measuring the Effectiveness of Projects and Student Learning Ownership through Differentiated Assessments in Science - The purpose of this study was to measure the effect of choice in assessment style, and to measure the reliability of projects as assessment instruments. Data collection involved a comparison of test and project results, student attitude surveys, a questionnaire, and teacher observations. Results suggest that projects are a reliable assessment instrument; they were preferred by students, and students were more involved in the process of their own learning, demonstrated by reported time spent on task and effectiveness of formative assessment pieces.

9 am Mary Mingles Reid 101
Holbrook, Massachusetts
Holbrook Junior/Senior High School

Facilitator: Marcia Blome

The Effects of Inquiry Activities in a Ninth Grade Physics Classroom - This study focused on the impact of including guided inquiry activities in ninth grade introductory physics classes. Data showed students preferred the inquiry activities to the previous class structure and their understanding of the physics content increased. Students were more engaged and actually requested to do more inquiry activities. Inquiry activities were found to be more effective when they followed direct instruction rather than being used to introduce a topic.

9 am Matthew Clay Reid 102
Joplin, Missouri
College Heights Christian School

Facilitator: Joshua Caditz

The Effect of Flipped Classroom Videos Filmed at Field Locations - In this project, videos filmed at field locations were used in place of narrated slideshows in a flipped classroom. The study explored the effect of these videos on student engagement and achievement. Test scores increased after students viewed field location videos but there was no improvement with narrated slideshows. This indicates such videos may not have an effect on student achievement. There was also a significant increase in engagement.

Tuesday, July 1, 2014

10 am Gary Sumner Reid 101

Baldwin, Wisconsin
Baldwin Christian School

Facilitator: Carol Smith

Using Concept Mapping to Advance the Understanding of High School Physics Concepts - This study investigated students interactively building concept maps during classroom discussion and for study guides at the end of a unit as activities to advance the understanding of physics concepts. Data were collected using targeted assessments, interviews, surveys, and observations to determine the effects of the activities. The results indicated that concept mapping helped students to understand and remember concepts. Also, the attitude for both students and teacher was improved.

10 am Heather Mitchell Reid 102

Houlton, Maine
Houlton Southside School

Facilitator: Shari Generaux

Using Blogging to Increase Science Content Knowledge and Transfer - This study looked at using blogging in the general science classroom to increase the acquisition of science content knowledge and transfer. Research questions considered blogging as it relates to increased critical thinking skills along with improved acquisition and transfer of content knowledge. Other considerations included improvement of test scores due to blogging and the impacts of blogging on teachers, both positive and negative. The participants of this research project were 40 fifth grade students at a small rural school in Maine. Methods consisted of implementing a classroom blog with strict guidelines in one group of 19 students while not implementing the same for the second group of students. All other methods of teaching, including lecture, discussion, labs, and text readings were the same. Data collection and analysis included classroom observations, student surveys, teacher reflection, student reflection, and classroom assessments.

11 am Jocelyn Wells Reid 101

Saint John, New Brunswick
St. Malachy's Memorial High School

Facilitator: Jennifer Heisler

The Effects of Introductory Station Labs in High School Physics - Introductory Station Labs were used to engage students in a variety of short collaborative investigations prior to the beginning of formal instruction with three high school physics classes. The labs helped students to make real-world connections, they provided sources of reflection while problem solving and enriched their experience with the world. A positive shift in student interest levels was noted.

11 am Terina Konrad Reid 102

Rupert, Idaho
Minico High School

Facilitator: John Henry Davis

The Effects of Project-Based Learning on Student Achievement and Motivation in Remedial High School Algebra - The research examined the effects of project-based learning on student achievement and motivation in a remedial high school algebra classroom. Throughout the research period, 13 projects were included in the algebra curriculum. Projects included card games to reinforce integer operations, order of operations puzzles, equation bingo, and teleconferences with NASA engineers about applications of mathematics. Research showed project-based learning as a good teaching tool to help motivate students to learn.

12 pm Kal Pokley Reid 101

Lima, Montana
Red Rock Lakes National Wildlife Refuge

Facilitator: Jessica Vasquez

Testing Competing Hypotheses for the Seasonal Variation in Nesting Success of a Late-nesting Waterfowl - Collected data and analyzed results of Lesser Scaup nesting ecology. Nest searching was conducted at Red Rock Lakes National Wildlife Refuge, Lima, Montana. Nests were located during nest searches conducted from May through July until the fate of the nest was determined. Nest age, nest location, vegetation height, distance to water and depth of water was recorded at each nest.

Tuesday, July 1, 2014

12 pm Dori McCormick Reid 102
 Harrison, Ohio
 William Henry Harrison High School

Facilitator: Jacquelyn Haas

Implementing Cooperative Learning Strategies with an Emphasis on Teambuilding in a High School Physics Classroom - At the beginning of the unit on light, students were assigned groups and teambuilding activities were conducted. When completing group assignments, cooperative learning strategies were implemented. The treatment data suggested that students were more willing to work together than the students who were not taught with these strategies. Although data was collected to determine academic improvement and attitude toward lab activities, the timeframe was too short to draw a conclusion.

1 pm Michael Tang Reid 101
 Walnut, California
 Southlands Christian Schools

Facilitator: Carissa Ketchen

The Impact of Science Fiction Media on Student Interest and Learning - The purpose of this research project was to determine if the use of science fiction media in the classroom can impact student learning and interest in science. Students were shown clips from various science fiction films such as *Gattaca* and *Spider-Man* throughout each unit. The class then discussed different aspects of the plot, how the movies used science, and how science concepts played a role in the movies. Student learning was gauged by the assessments in each unit while student interest in science was assessed through the Science Subject Survey and the Post-Treatment Interview.

2 pm Mariann Bernard Reid 101
 San Marcos, California
 San Elijo Middle School

Facilitator: Sara Grotbo

Effects of Project-Based Inquiry Lessons Integrated with Technology on Understanding Eighth-Grade Physics Concepts - This study investigated the effects of project-based learning (PBL) lessons with access to technology on student understanding of motion, speed, acceleration, and Newton's Laws, and their motivation. Teacher-centered instruction began the units and progressively transitioned to a student-centered environment with open access to technology. Engagement in the PBL process resulted in improvement in student understanding as well as motivation, especially with low-achieving learners.

3 pm Mark Meredith Reid 101
 Russellville, Arkansas
 Russellville High School

Facilitator: Matthew Haack

Testing the Effectiveness of Different Moodle Assignment Styles on Improving Student Comprehension of Biology Concepts and Attitudes toward Homework Assignments - Moodle is an online virtual learning environment that offers educators a wide variety of tools for promoting learning. The purpose of this study was to see if the level of peer to peer interaction of the different Moodle assignments influenced their effectiveness as learning tools. A second goal of the study was to determine if student preferences for assignments on Moodle were based on the level of peer interaction involved. It was found that student perceptions of Moodle assignment contributions to learning were positive overall with mixed views on the different styles of assignments.

3 pm Eric Ojala Reid 102
 Missoula, Montana
 Hellgate High School

Facilitator: William Iliff

Misconception Based Curriculum Restructuring for Freshmen Earth Science Students via Moon Journal Projects - My project involved curricular redesign focused around the freshman earth science astronomy unit. I reworked my moon journal project with different formatting, requirements, presentation materials, and labs with the goal of better addressing content misconceptions. I evaluated progress using pre/posttests, and compared the astronomy treatment unit to the control meteorology unit. Treatment test growth was greater than that of the control, although moon journal scoring and participation could be improved.

Tuesday, July 1, 2014

5 pm Casey McHugh Reid 101
Missoula, Montana
Cold Springs Elementary

Facilitator: Justi Crofutt

The Impact of Guest Speakers and Place-Based Learning in the Science Classroom - In this study, guest speakers and place-based learning were introduced into the fifth grade science class to determine if there would be an increase of student understanding of science content. Three presenters and three place-based experiences occurred during the study. The findings suggest that there was growth in the students' knowledge and confidence in the content area after hearing the presenter and experiencing the science.

5 pm Dean Brown Reid 102
Medicine Hat, AB (Canada)
Crescent Heights High School

Facilitator: Michael Poser

Effects of Cooperative Pre-activities on student understanding in High School Biology - High school biology students are expected to learn complex outcomes, as well as participate in classroom assignments and activities. Cooperative pre-activities and cooperative learning structures were used to allow students to gain some prior knowledge that would not only enhance cognitive development, but increase self-confidence and motivation to become more engaged in the learning process. In addition, teacher motivation and improved pedagogy also impacted the learning environment in a positive manner.

Wednesday, July 2, 2014

7 am David Dooling Reid 101
Alamogordo, New Mexico
New Mexico Museum of Space History

Facilitator: Chris Koper

The Awful Truth about Zero-G - Many people wrongly believe there is no gravity in space. I used the Conceptual Change Model to have students first re-enact the discovery of gravity, then use a mini-drop tower with a camera to demonstrate what happens to objects and different phenomena in free-fall. Surveys with one teacher group and six classes show this to be a valid, engaging approach to correcting a common misperception.

8 am Stephen Mohr Reid 102
North Jackson, Ohio
Jackson-Milton High School

Facilitator: Kaylee Shaw

The Effect of Computer Simulations on the Conceptual Understanding in General Chemistry Lab - Computer simulations provide an interactive and visual environment that promote and support conceptual change in chemistry education. It is through the implementation of a series of inquiry based student activities that these simulations will be evaluated for their effectiveness in improving conceptual understanding. The results of this study revealed that traditional instruction supplemented prefaced with computer simulations helped students perform better on short term conceptual assessments.

9 am Chris Koper Reid 101
Robeson, Pennsylvania
Conrad Weiser Area School District

Facilitator: Elaine Gibbs

The Effects of Personal Response Systems on Student Engagement and Performance on Science Tests - A growing number of classrooms are using Personal Response Systems, or clickers, to enhance instruction in the classroom. This paper examines the effects of using clickers on student performance on semester exams as well as student perspectives on using these devices in their classrooms. Thirty-two students were surveyed in two college preparatory physics classes in different semesters over the course of a year. The fall semester course used the clickers while the spring semester classes did not. Both student's perspectives on using clickers and their academic performance were assessed. It was found that, though student interest and confidence seemed greater with the use of these devices, teacher generated exams did not see much benefit at all. In fact, 33% of students using clickers scored an A or B on semester exams while 43% did so without the use of clickers. This was the case with course grades as well. So, though clickers do not seem to indicate increased academic success in the classroom the devices are popular with students in regards to engagement in the classroom itself.

Wednesday, July 2, 2014

9 am Analea Hronek Reid 102
 Belfry, Montana
 Belfry School

Facilitator: Rachel Tinkler

The Effects of a River Study Program on Students' Comprehension, Skills, and Attitudes in Science - This study focused on whether an outdoor river study program increased students' science comprehension, skills, and changed their attitudes towards science and environment. The data shows that students' knowledge of science concepts did not increase significantly, students retained the river study concepts more easily compared to indoor classroom science concepts. Students' attitudes towards science, the environment, and themselves as learners were shown to be more positive post-river study.

10 am Dawn Mercer Turner Reid 102
 Huntsville, Alabama
 NASA Marshall Space Flight Center

Facilitator: Irene Catlin

Engineering and Science Career Development: Self-Reflection and Other Methods Used to Steer Professional Development - A challenge faced in today's technical workforce at NASA is to transfer the knowledge from employees who have years of experience to those with less experience. Typically, the method of transferring the information is through hands-on experiences over time. However, this study attempts to determine if using more experienced employees in training opportunities, while incorporating real-world examples, can effectively transfer this knowledge and assist employees in self-reflection and career planning.

11 am Angie Jenkins Reid 101
 Waterloo, Iowa
 Waterloo East High School

Facilitator: Heidi Jessen

The Effects on Individual Grades and Test Scores When Assigning and Grading Homework in a Ninth Grade Physical Science Classroom - The purpose of this study was to examine the effects of graded versus non-graded homework on proficiency, test scores and course grades in physical science. Two classes were selected and compared on proficiency, test scores and overall grades after each unit. It was determined that students do not need to have graded homework assignments in order to display proficiency on tests and pass the class with an above average grade.

12 pm Jennifer Heisler Reid 102
 Helena, Montana
 Jim Darcy Elementary

Facilitator: Ahmed Shawli

The Impact of Increased Nonfiction Reading on Student Achievement in Science - As technology progresses, teachers must constantly evaluate what tools are best practice for learning in their classroom. Student created digital media provides an avenue for students to express their learning and engagement in the classroom while practicing 21st century skills. This study looked at the effectiveness of student created digital media projects versus a traditional approach and their effect on learning and motivation. Utilizing qualitative and quantitative methods, this study found very little difference between these two approaches.

1 pm Jim Bratka Reid 101
 Nunapitchuk, Alaska & Columbus, Ohio
 Anna Tobeluk Memorial School & Reynoldsburg High School

Facilitator: Matthew Clay

If Student Curiosity in Familiar Items is Stimulated, Will Their Curiosity in Science Be Stimulated, Resulting in an Increase in Science Grades? Different items were introduced into several classrooms; students were given a series of questionnaires, interviews and journaling opportunities to document their observations. Class discussions were held to get a general input from the class as a whole as to the level of curiosity. Responses were collected using clicker devices. Data was collected and results indicated a marked improvement in student curiosity levels as well as their interest in science.

Wednesday, July 2, 2014

1 pm Alecia Jongeward Reid 102

Bozeman, Montana

The Museum of the Rockies

Facilitator: Terina Konrad

How are Montana's Teachers Using the Taylor Planetarium as a Teaching Tool? - This project evaluated how teachers bringing groups to the Museum of the Rockies used the Taylor Planetarium as a learning tool. Teachers who visited the Museum between October 2013 and March of 2014 were asked to participate by answering questions via online surveys and phone interviews. This project generated evidence that there is a considerable need to increase the communication level between Montana's teachers and the Museum of the Rockies.

2 pm Clinton Whitmer Reid 101

Brockton, Montana

Brockton School District

Facilitator: Jennifer Smith

The Effects of Cooperative Learning on Native American Students' Understanding of Environmental Science - This project investigated the effects of cooperative learning strategies with high school students in environmental science. The students, who were mostly Native American, experienced special group discussions and groups working together to perform lab activities. The results were positive for understanding environmental science, promotion of higher-order thinking skills, and student social interaction and discussion.

2 pm Melissa Thompson-Krug Reid 102

Omaha, Nebraska

Zoo Academy, Omaha's Henry Doorly Zoo & Aquarium

Facilitator: Quincie Lords

The Effects of Authentic Learning Experiences on Female Students' Perceptions of Science and Confidence in Attaining a Stem Career The purpose of this research project, carried out at Omaha's Henry Doorly Zoo & Aquarium's Zoo Academy Program, was to determine whether authentic learning experiences improve female students' perceptions of STEM (Science, Technology, Engineering & Mathematics) and confidence in attaining a STEM career, with an emphasis on hands-on learning experiences and strategies for engaging female students. Data collection tools indicate students' perceptions of STEM are improved through these methods.

3 pm Donna Tully Reid 101

Honolulu, Hawaii

Kamehameha Schools, Kapalama Campus

Facilitator: Kyle Herdina

The Effects of a Flipped Learning Model Utilizing Varied Technology Verses the Traditional Learning Model in a High School Biology Classroom - In an effort to measure the effects of a flipped learning model utilizing varied technologies verses a traditional learning model, freshmen and sophomore students in four high school biology classes were studied over five units during the second semester of the 2013-14 school year. Data indicated the flipped learning model is effective in increasing student interest, motivation, engagement, and homework completion, but did not reveal a reliable increase in student achievement.

3 pm Krista Martens Reid 102

Columbia Falls, Montana

Columbia Falls High School

Facilitator: Jocelyn Wells

Effects of Crib Sheets Compared to Open Notebooks on Summative Assessment in an Introductory High School Earth Science Class - My research compared the use of crib sheets and open notebooks for student assessment scores. The results did not reveal a noteworthy difference. What I did find significant is students' perceptions that crib sheets are helpful, and so I will utilize crib sheets next year. I believe increased learning will occur if students are trained in their use and understand this is a valuable way to prepare for an exam.

4 pm Robert Lynch Reid 102

Haddon Heights, New Jersey

Haddon Heights High School

Facilitator: Joshua Abernathy

A Study on the Use of Student Centered, Internet Based Problem Solving Instruction in AP Physics - The goal of my AR will be to develop alternate methods of going over problems in the form of a series of web posts. This will allow the students to access and work with the solutions to a large percentage of the assigned problems on their own, thereby freeing up classroom time for more in depth coverage of the material including extended discussions, demonstrations, and inquiry based laboratory activities.

Wednesday, July 2, 2014

5 pm Christine Jones Reid 101
Battle Ground, Washington
Tukes Valley Middle School

Facilitator: Tanya Long

Incorporating Language Arts Strategies in the Science Classroom to Improve Student Writing - The purpose of this project was to help students improve their writing skills by utilizing procedures learned in writing class in the science classroom with the goal of preparing them for the state science assessment. All students improved in writing evidence-based conclusions. Results indicated that evidence-based writing can be used across the curriculum and students benefit from using a general scaffolding for writing.

5 pm Cameron Burns Reid 102
Oakesdale, Washington
Oakesdale School, Oakesdale School District

Facilitator: Mark Meredith

Shared Learning Targets: Effects on Student Achievement When Learning Targets are Communicated with Students - A descriptive study that looks at the construction and use of student-shared learning targets for the immediacy of individual lessons and the effects they have on student achievement in the middle school science classroom. Being new to the use of student-shared learning targets, the researcher describes the results between treatment and non-treatment periods, making comparisons between the two periods, and reflects on the process and use of student-shared learning targets.

Thursday, July 3, 2014

7 am Kaylee Shaw Reid 101
Kalispell, Montana
Flathead High School

Facilitator: Dawn Mercer Turner

Use of Computer Simulations in Physics: Comparison of Simulation Implementation as Introductory or Reinforcement Tools - This study investigated whether the use of online simulations are more effective as introduction activity or concept reinforcement in the high school physics classroom. The effectiveness of simulations based on student preference and performance was analyzed using the topics of Energy, Force, the Law of Gravitation and Thermal Physics. The study showed students preferred and had greater conceptual understanding when computer simulations were used as a reinforcement tool.

7 am Stephanie Fields Reid 102
Woodbine, New Jersey
Woodbine Elementary School

Facilitator: LeAnn Thongvanh

Using Student Growth Objectives and Inquiry Based Learning to Promote Science Literacy in the 21ST Century Learner - This study focused on vocabulary and writing skills to promote scientific literacy. The need for a strong vocabulary background was evident for at-risk students where there is little support from home. Students were not scoring well on assessments due to the lack of understanding scientific terminology and poor study habits. Throughout the study my eighth grade students used a variety of exercises improving science context and showing growth.

8 am Carol Smith Reid 101
Van Alstyne, Texas
Van Alstyne High School

Facilitator: Heather Mitchell

ChemQuest1: Do Gaming Strategies Affect Student Engagement and Motivation in the Chemistry Classroom? - In my project, I investigated the effects of a particular set of gaming strategies on student motivation and engagement in learning chemistry. I designed ChemQuest1 to use game elements such as leaderboards, experience points, guilds, tasks, battles and boss fights to engage students in learning chemistry. Part of the impetus of this design was to reduce students' fear of failure by allowing them multiple tries to be successful without incurring a penalty.

Thursday, July 3, 2014

8 am Coreen Dingler Reid 102
Diboll, Texas
H. G. Temple Intermediate, Diboll ISD

Facilitator: Kal Pokley

How is Student Achievement on Assessments Impacted by the Use of Computer Based Tests? - In this investigation assessments using classroom technology were implemented with the purpose of looking for the effect that computer based testing had on student achievement. This study involved a comparison between the use of pencil-paper tests and computer based tests. The data was used to analyze whether or not the use of computer based tests had an effect on student achievement in a fifth grade science classroom.

9 am Justi Crofutt Reid 101
Big Piney, Wyoming
Big Piney High School

Facilitator: Christina Scott

The Effect of Case-Based Learning in a High School Anatomy and Physiology Class on Student Motivation, Higher-Order Thinking Skills, and College Readiness - This study considers the effectiveness of case-based learning (CBL) on motivation, higher-order thinking skills, and college preparedness in a high school anatomy and physiology classroom. Data was collected over four units of study using different CBL methods. Surveys, interviews, and pre-/posttests were all used as means to collect data. They compared the engagement levels, the skills developed for career and college readiness, and critical thinking skills using traditional methods versus CBL. From the data collected, there was no conclusive evidence to support an improvement in college preparedness. Student motivation and engagement increased slightly for CBL and there was a definite improvement in higher-order thinking skills after the use of any CBL throughout these units.

9 am Rebecca Dobson Reid 102
Bristolville, Ohio
Bristol High School

Facilitator: Garold Sumner

The Effect of Scientific Explanation Instruction on Extended Response Performance by Eighth Grade Science Students - This project sought to discover if direct instruction of scientific explanation will improve student performance on extended response style questions. Students were taught scientific explanation using Katherine McNeill's Claim-Evidence-Reason Framework. Activities were scaffolded for increasing difficulty and culminated in an inquiry project requiring them to write a scientific explanation from data they collected. Eight of nine students in the research group showed improvement in scientific explanation writing skills.

10 am Matthew Haack Reid 101
North East, Maryland
North East High School

Facilitator: Sherry Otruba

The Effects of Cooperative-Learning Strategies on Students' Understanding of High School Biology - This study investigated how the use of cooperative-learning strategies affected student understanding, long-term memory, attitudes, and engagement. Understanding was compared with and without cooperative learning. The results showed a definitive improvement in student understanding for the high-achieving students and improvement in long-term memory, and a modest increase in attitudes and engagement for all students and teacher's attitude.

10 am Katie Redmond Reid 102
Chicago, Illinois
Herzl School of Excellence

Facilitator: Lynn Powers

The Effects of Problem-Based Learning on Student Achievement in a Fourth Grade Classroom - In this action research, project-based learning was implemented with the purpose of improving student achievement and student engagement within the science classroom. Students participated in project-based learning activities in addition to their traditional instruction. Students' achievement in science and attitudes toward science and school were measured throughout the action research through assessments, observations, attitude surveys, and daily tasks. Academic growth was seen in students who typically perform below grade level, in addition student engagement and attitudes were positively impacted.

Thursday, July 3, 2014

11 am Shari Generaux Reid 101
Oakland, California
Montana State University

Facilitator: Deanna Bailey

The Effects of the 5E Learning Cycle on Student Integration of Science Vocabulary - The purpose of this study was to determine the effects of inquiry based instruction on students' ability to access, synthesis and use vocabulary on written assignments, assessments and in discourse. The results of this study show students perform better on classroom assessment and writing assignments when the 5E Learning Cycle was used prior to the introduction of vocabulary. The most growth was identified among female African American students.

11 am Kara Coates Reid 102
Elko, Nevada
Great Basin College

Facilitator: Eric Ojala

Will The Use Of Conceptual Lab Reports and Prelab Quizzes Improve Overall Student Grades? - The purpose of study was to determine if overall student success increases by adding a prequiz and assigning conceptual lab reports in a college freshman level introductory biology lab class. Combined lecture and lab grades were analyzed between two groups of students. The study was based on the premise that writing promotes learning thereby increasing students overall success in biology. No strong positive objective outcome was observed although writing skills improved.

12 am Chance Duncan Reid 102
Atkins, Arkansas
Atkins High School

Facilitator: Mariann Bernard

Determining the Impact of the Atkins School District's Technology Initiative on the Student's Ability to Learn, the Teacher's Ability to Teach - This project was designed to determine the educational impact of the technology initiative the Atkins School District began in 2013. The research included data from both students and teachers and discovered that technology has an overall positive, if only slightly, impact on the quality of education but must be properly supported for the most successful results.

1 pm Logan Mannix Reid 102
Helena, Montana
Capital High School

Facilitator: Randy Rowland

What Are the Effects of Standards-Based Grading on Student Learning and Behavior in the Secondary Science Classroom? - Traditional points-based grades can be inconsistent, and their meaning can be watered down by non-academic factors. In addition they may lead students and parents to focus more on earning points by turning in assignments and extra credit than on learning in order to game the system. Can switching to a standards-based grading system help change students' focus, improve learning outcomes, and change the conversation between teachers and their students?

1 pm Candace McMullan Reid 102
Fishers, Indiana
Holy Cross Lutheran School

Facilitator: Casey McHugh

The Effects of Open Inquiry versus Guided Inquiry on Student Achievement and Enthusiasm For Science - In order to identify the benefits of inquiry education on student enthusiasm and success, sixteen seventh graders were analyzed over the effectiveness of open inquiry versus guided inquiry. Students conducted open and guided inquiry labs, and were analyzed through surveys, interviews, discussions, assessments, and lab reports. Data showed positive correlations with all forms of inquiry, but there were greater connections to learning, motivation, and enthusiasm with the guided inquiry format.

Thursday, July 3, 2014

2 pm Lisa Lundgren Reid 102
Gainesville, Florida
Florida Museum of Natural History, University of Florida

Facilitator: Mary Mingles

Exploring How Children Use Science Process Skills in a Museum Setting - In the Florida Museum of Natural History's Discovery Room, children explore scientific concepts. The usage of science process skills (SPS) such as observation, communication, inference, and prediction had not been studied. I conducted observational research into how children used SPS. Data analysis showed that children used SPS more frequently at "dynamic" stations, which should be included in the new Discovery Room that will be built in 2015.

3 pm Christina Wallace Reid 101
Gainesville Missouri
Gainesville R5 School District

Facilitator: Daniel DuBrow

The Effect of Engaging Assignments on Students Performance in the Science Classroom - The purpose of this study was to improve student performance by changing assignment types given in the science classroom. It was accomplished by giving teacher created resources and CATs as described by Anglo and Cross. The students engaged in writing assessments and other activities. Intervention strategies, including Response to Intervention Program (RTI), were used for the students who still did not complete the tasks assigned on time.

3 pm Matthew McClellan Reid 102
Lake Charles, Louisiana
Calcasieu Parish 4-H

Facilitator: Dean Brown

Informal Youth Educational Programming and its Effect on Environmental Stewardship and Formal Science Classroom Performance
In this investigation, 4-H Outdoor Skills Programming was used to determine its effect on participants' formal science classroom performance, development of life skills, leisure activity choices, and whether this type of adventure programming can increase a participants' level of environmental awareness. Parent and participant surveys, interviews, and direct observation techniques were used to gather data during intervention sessions with two 4-H project clubs in Calcasieu Parish, Louisiana. Results indicated that these programs do accomplish life skill development and improvement in environmental awareness, but no correlation was found to indicate improvement in the formal classroom or in a decrease in reliance on electronic devices for entertainment.

4 pm Ashley McGrath Reid 101
Cascade, Montana
Montana State University, Bozeman

Facilitator: Alicia Jongeward

Taphonomy of the Modern Tree-Based Nesting of Great Blue Herons - This research supports the growing number of modern bird taphonomic studies and furthers our understanding of the taphonomy of birds and non-avian dinosaurs. The purpose was to determine if Great Blue Herons (*A. herodias*) are acceptable proxies for dinosaur nesting localities through the taphonomy of the biological material found below the tree-based nests. This study recognized a variety of signatures specific to arboreal nesters, including eggshell orientation characteristics and skeletal representation biases.

5 pm Joshua Caditz Reid 101
Carpinteria, California
Cate School

Facilitator: Jeffrey Noblejas

The Effects of Differentiated Homework on Student Performance, Interest, and Diligence in a High School Biology Course - The use of differentiated homework structures and vodcasts were investigated to determine if they improved student interest, diligence, and understanding of high school biology content and concepts. The project results support the notion that the use of vodcasts increase student interest and provide a useful alternative homework tool. The results do not support the use of a differentiated homework structure for the acquisition of biology content or mastery of concepts.

Saturday, July 5, 2014

7 am John Henry Davis Reid 101
 Cullowhee, North Carolina
 Western Carolina University

Facilitator: Stephen Mohr

The Effects of Documented Problem Solutions on Problem Solving Skills for Introductory College Physics Courses - My students struggle to solve physics word problems when the solution is not explicitly given to them. They can understand abstract concepts and repeat a problem that is solved correctly for them, but cannot solve word problems that are new. The ability to solve problems should be a skill that a student acquires or improves at as a result of taking a college physics course. Over the past several years of teaching I have noticed that despite my best efforts, I have not observed any measurable improvements in my students' abilities to solve physics problems. As a physics teacher, I needed to find some way to help my students become more comfortable and learn to enjoy solving physics problems. This capstone projects investigates the effect of formative assessments on improving student's ability to solve physics problems.

8 am Marka Latif Reid 102
 Bozeman, Montana
 Headwaters Academy

Facilitator: Lily Guajardo

The Effects of Compacted Science Units on Student Retention of Science Concepts the Effect of Class Websites on Student Engagement in Middle School Science - From a descriptive study in which middle school science students were observed over a period of a little over four months during which class websites were used in a variety of capacities; it was determined that class websites increase students' sense of autonomy, but do not change students' attitude towards homework. It could not be determined if student engagement is affected, but was found that teacher practices were positively impacted.

9 am Sara Grotbo Reid 101
 Helena, Montana
 Helena Middle School

Facilitator: Melissa Thompson-Krug

Effect of Reflection on Student Achievement and Self-Confidence in the Science Classroom - This project focused on the use of guided reflection in the middle school science classroom. Students reflected using various strategies both at the beginning and end of each class period. The goal of the project was to see how this daily reflection would affect student achievement and self-confidence for the learning goals of a unit. Students' achievement and self-confidence was evaluated by several methods. The results showed positive increases in both achievement and self-confidence.

9 am Rachel Tinkler Reid 102
 Shorewood, Wisconsin
 Lake Bluff School

Facilitator: Camilla Dusenberry

Infusing Science into Native American Studies: A Project-Based Unit for Fourth Grade - In this study a project-based learning unit was implemented in order to determine how student learning and engagement would be affected in a fourth grade classroom. The unit required individual or group research, creation of a project artifact, and a public presentation component. Compared to a traditionally designed unit on the same topic, participants in the project-based learning group showed modest gains in student learning and periods of increased engagement.

10 am Elaine Gibbs Reid 101
 Tampa, Florida
 Middleton Senior High School

Facilitator: Scott Lilley

The Effects of Differentiated Instruction Based on Multiple Intelligences with AP Chemistry Students - This study investigated the design and utilization of differentiated instructional activities and lessons based on student's profile of multiple intelligences. Students were grouped in homogeneous sets based on their highest intelligence for an introductory lesson and for subsequent lessons students worked collaboratively in integrated heterogeneous groups. The results were positive for the low-achievement group's understanding of concepts, engagement of the entire class, and teacher self-perception.

Saturday, July 5, 2014

10 am Marcia Blome Reid 102
 Omaha, Nebraska
 Westside Middle School

Facilitator: Donna Tully

Technology Immersion in the Eighth Grade Science Classroom - In this action research project, technology immersion was integrated at various levels of content instruction with the purpose of measuring student engagement in eighth grade science. Students applied increased levels of technology during the course of introduction of material, exploration and assessment. The data collected points towards an increase of engagement while improving understanding in science.

11 am William Iliff Reid 101
 Sacramento, California
 Christian Brothers High School

Facilitator: Doralee McCormick

The Effects on Learning for the High School Biology Student with the Implementation of the Individual iPad Usage in the Classroom
This project studied the introduction of the individual iPad from the perspectives of the students, their parents, and science department teachers. The collected data suggested increased homework completion, perceived better test preparation, and reading assignment completion. Distractions due to unauthorized game playing were a significant negative factor for some students. Future gains seem possible with differentiated instruction, student engagement, and further integration of technology into the science laboratory.

11 am Kyle Herdina Reid 102
 Welch, Minnesota
 Prairie Island Indian Community

Facilitator: Christina Wallace

Integrating Native American Mdewakantion Sioux Culture with Environmental Science Curriculum - The need to develop culturally-related educational resources that engage Native American students has driven many educators to develop their own material. In this study, educators spent time researching and developing a cultural plant field guide to use within their environmental education and outreach program on the reservation. This action research process provided educators with culturally relevant science material while increasing their knowledge and confidence to engage Native American students.

12 pm Jessica Vasquez Reid 102
 Cedar Rapids, Iowa
 Harding Middle School

Facilitator: Stephanie Fields

Use of Standards-Based Grading to Increase the Teacher's Overall Understanding of Student's Learning in the Seventh Grade Science Classroom - Standards Based Grading in the classroom was examined along with the extent to which it would increase students' overall understanding of the materials. Specifically, an analysis of authentic reflection by the student on their learning and the quality of the reflection was compared to their overall understanding of the materials. Students who demonstrated a quality reflection were much more likely to be proficient on the summative assessment.

1 pm Nicolai Love Reid 101
 Jackson, Missouri
 Saxony Lutheran High School

Facilitator: Lisa Lundgren

The Effects of Teaching the Nature of Science on Higher Order Thinking Skills - The study focused on how teaching a unit specifically about the Nature of Science influenced the students' capabilities to analyze, evaluate, and synthesize scientific information. The Next Generation Science Standards, released in April of 2013, were the benchmarks used for designing the curriculum. The results indicated that the largest improvements in student ability and confidence were in evaluating scientific information.

1 pm Pamela Schaefer Reid 102
 New Jersey
 Vernon Township High School

Facilitator: Clinton Whitmer

Writing a Scientific Research Question for Independent Investigation in the High School Laboratory - The focus of this project was on teaching and guiding a small group of high school seniors in writing testable scientific questions, ultimately for their own independent research. Using a series of teaching modules, group discussion, online data sets and rubric-scored tasks, students practiced and refined the skills needed to become proficient in formulating quality scientific questions.

Saturday, July 5, 2014

2 pm Heidi Jessen Reid 102

Yuma, Arizona

Fieldwork conducted on the Island Farm in Yuma County

Facilitator: Analea Hronek

Comparison of Tillage Practices on Soil Health in the Lower Colorado River Basin Region of the Sonoran Desert - When you think of leafy vegetables does the word *desert* come to mind? For this project I studied the impact tillage has on soil composition. Three adjacent fields in the Lower Colorado River Basin in Arizona were used in this comparative study. Soil health indicators were tested by laboratory and fieldwork. Among the outcomes, soil organic matter and soil bacteria had positive correlation increasing as tillage levels increased.

3 pm Jacquelyn Haas Reid 101

Hartford, WI

St. Lawrence

Facilitator: Jim Bratka

The Effects of Scientific Practices in Ninth Grade Religious Education Lessons - Scientific and engineering practices were integrated into newly designed ninth grade religious education lessons to improve faith knowledge and student engagement. The 20-lesson treatment included opportunities for students to engage in argument with evidence, use and develop models, and communicate with peers. Results indicated that 92% of ninth grade students believed that incorporating scientific practices in religious education lessons had a positive impact on their faith learning.

3 pm Carissa Ketchen Reid 102

Kalispell, Montana

Summit Preparatory School

Facilitator: Robert Lynch

Teaching Science with Science Fiction - The focus of this project was to determine how the incorporation of science fiction reading material impacts student learning. Four specific areas were measured; student engagement, concept reinforcement, interest in science related careers, and science literacy. Data collection and analysis reveal a marked improvement in all areas of the measured areas indicating that utilizing science fiction reading material is a useful strategy for teaching science content.

Scheduled to present outside of Capstone Week:

Katherine C. Koessler

Mendota Heights, Minnesota

Saint Thomas Academy

Effects of Online Prelab Activities on Success in Laboratory Exercises in the Science Classroom - Laboratory exercises have always been an integral component of science education. Although laboratory work can provide students with opportunities to see science in action, practice inquiry skills and analyze real time data, it is not always clear that laboratory exercises are an effective means of supporting content learning in science. Through the use pre-lab activities, facilitated by student iPad use, the goal of this project is to provide students with reflective and preparatory experiences that assist in connecting laboratory outcomes with the science content of study.

1999 Graduates

Paul Andersen, Bozeman, MT
Edward Barry, Sacramento, CA
Richard Dees, Billings, MT
Maureen Driscoll, Butte, MT
Janet Erickson, Helena, MT
Beth Farrar, Rapid City, SD
Kerry Friend, Cayucos, CA
Jonathan Hanson, Big Fork, MT
Melissa Henthorn, Turah, MT
Kevin Klawonn, Lennox SD
Nancy Males, Mansfield, TX
Wayne Mangold, Plevna, MT
David McDonald, Sidney, MT
Joy-Lyn McDonald, Sidney, MT
Josey McLean, Great Falls, MT
John Miller, Billings, MT
Randall Morgan, Ketchikan, AK
Kelly Morrow, Kalispell, MT
Marjorie Robbins, Morton, IL
Lisa Rubright, Manhattan, MT
Peggy Taylor, Farmington, NM
Shannon Walden, Fort Benton, MT
Martin Wells, Taylor Mill, KY

2000 Graduates

Randall Carmel, Millersburg, OH
Beverly DeVore, Meeker, CO
Ivanell George, Houston, TX
Jeffery Greenfield, Shepherd, MT
Mark Halvorson, Sidney, MT
Tom Hennard, Stavanger, Norway
Steven Lockyer, Conrad, MT
Ann Lukey, Alberta, Canada
Lisa Mahony, Bozeman, MT
Craig Messerman, Missoula, MT
Kathleen Napp, Scottsdale, AZ
Sandy Shutey, Butte, MT
Lisa Snyder, Chetenne, WY
James Temple, Glendive, MT
Melanie Vinion, Wooster, OH
Chrystal Wells, Taylor Mills, KS

2001 Graduates

Robert Beese, Gardiner, MT
Rodney Benson, East Helena, MT
Jeffrey Berg, Auburn, MA
Lawrence Bice, Cottonwood, AZ
Penny Long Blue, Ellsworth, KS
Kathy Brown, Taft, CA
Daniel Campbell, Big Timber, MT
John Etgen, Belgrade, MT
Sharon Fox, Great Falls, MT
Ashton Griffin, Goldsboro, NC
Taylor Hansen, Bozeman, MT
Deanna Hill, Alberta, Canada
Richard Lahti, Fergus Falls, MN
Sanford MacSparran, Logan, UT
Bradley Piroutek, Belleville, KS
Rebecca Reno, Havre, MT
David Robbins, Nairobi, Kenya
Jack Schoonen, Dillon, MT

Wendy Sink, Burton, MI
Clinton Stephens, Escalante, UT
Kathleen Thorsen, WI

2002 Graduates

Ronald Abarta, Chehalis, WA
Shannon Bowen, Strasburg, VA
Peter Bregand, Fullerton, CA
Pamela Duncan, Woodstock, IL
Leslie Griffen, Rohnert Park, CA
Mary Jane Goebel, Rapid City, SD
Jody Hurd, Helena, MT
Tom Huston, Vale, OR
Kevin Kapanka, Kenton, OH
Lloyd Magnuson, Butte, MT
Deanna Mazanek, Athena, OR
Todd Morstein, Lakeside, MT
Melissa Newman, Dutton, MT
Chris Ottey, Bozeman, MT
Robert Pendzick, Canfield, OH
Mary Slack, Wheaton, IL
Michelle Snyder, Athena, OR
Michele Thomas, Bakersfield, CA
Kerby Winters, Vale, OR

2003 Graduates

Cyndie Beale, Fairbanks, AK
John Scott Beaver, Talpa, TX
Amy Berg, Auburn, MA
Eric Berg, Auburn, MA
Nikki Bethune, Sapulpa, OK
Bruce Bourne, Seeley Lake, MT
Kevin Bowman, Jackson, OH
Corbin Brace, Waterville, ME
Kelly Cameron, Ridgefield, WA
Ralph Carlson, Hilmar, CA
Corinne Chavern, Pittsburgh, PA
Susan Choman, E. Wenatchee, WA
Tom Cabbage, Great Falls, MT
Sandra DeYonge, Rye, NY
Sharon Dotger, Raleigh, NC
Phyllis French, Douglasville, GA
Michele Geisler, Rutland, VT
Michael Gregory, Pinedale, WY
Robin Hehn, Roundup, MT
Kathy Howe, Houston, TX
Jack Julian, Cairnbrook, PA
Linnae Kendall, Saunemin, IL
David Lee, Taylorville, NC
Brita Lien, Alberton, MT
Eric Matthews, Bozeman, MT
Diane Mayer, Bozeman, MT
Birgitta Meade, Decorah, IA
Linda Moule, Claremont, CA
Susan Olsen, Brownsville, PA
Ryan Prnka, Skagway, AK
Rob Smith, Marengo, IL
Sonja Steffan-Squires, Lancaster, CA
Jim Striebel, Corvallis, MT
Nicole Trombetta, Duluth, GA
Melody VanderWeide, Grand Rapids, WI
Jeffery Wehr, Inverness, MT
Tim Ziegler, Stowe, VT

2004 Graduates

Kimberly Atkins, Annandale, MN
Christopher Cox, Buffalo, WY
Kelley Davis, Monkton, MD
Kirsten DeHart, Houston, TX
Patricia DiEduardo, Lewiston, ME
Terry Edinger, Trabuco Canyon, CA
Mary Margaret Eraci, Lombard, IL
Randall Farchmin, Menomonee, WI
Dona Furrow, Jackson Center, OH
Larry Gursky, Roy, WA
Emmylou Harmon, Kremmling, CO
Penny Juenemann, Two Harbors, MN
Loren Kane, Natick, MA
Robin Kent, Missoula, MT
Dan Kloster, Longmont, CO
Karen Krieger, Bozeman, MT
Deanna Meyer, West Jordan, UT
Lee Moss, Orangeville, UT
Michael Mulligan, Brazil
Katharine Murphy, Ogden, KS
DeAnn Neal, Midvale, UT
Jeannie Paszek, Reno NV
Glenn Peterson, Greeley, CO
Kim Popham, Lolo, MT
Mary Porter, Melrose, MA
Gordon Powell, Cortland, OH
Chuck Shepard, Saltsburg, PA
Bernie Smith, Colstrip, MT
Dorothy Smith, Colstrip, MT
Scotty Stalp, Germany
Kim Walker, Johnson, KS
Ericka Wells, Jackson, WY
Jeff Youker, Placerville, CA
Brian Zeiszler, Elko, NV

2005 Graduates

Marc Afifi, Seaside, CA
Christine Bergholtz, Kenai, AK
Matt Bilen, Elgin, IL
Andy Broyles, Aberdeen, SD
Brendan Casey, La Mesa, CA
Peggy Collins, Dudley, MA
Andrew Conger, New Orleans, LA
Michelle Cullen, Valdez, AK
Richard Davis, Frazier, MT
Eric Dougherty, Newport, NC
Brian Edlund, Benson, MN
Rachel Endelman, Monroe, WA
Monica French, Salt Lake City, UT
Nelson Fuamenya, Hunan, China
Ricarda Hanson, Ashland, MT
Kelley Hoffman, Beaver Dam, WI
Diane Holloway, Osaka, Japan
Steve Huffman, Honolulu, HI
Cathy James-Springer, West Indies
Roby Johnson, Yuma, CO
Ryan Kapping, Wadena, MN
Nicole Kirschten, Newfield, NY
Anita Linder, MT, Zion, IL
Brad Loveday, Alamo NV
Justin Lovrien, Sioux Falls, SD
Leslie McDaniel, Memphis, TN
Carla McFadden, Oroville, WA

2005 Graduates (Continued)

Valdine McLean, Lovelock, NV
Leslie McDaniel, Memphis, TN
Carla McFadden, Oroville, WA
Valdine McLean, Lovelock, NV
Chris McNabb, Ganado, AZ
Jomae Mertz, Parker, CO
Eric Miller, Athens, OH
Lelia Mitchell, Brighton, MA
Mark Nevala, Klamath Falls, OR
Kristina Newman, Swanton, OH
Helga Pac, Bozeman, MT
Lori Peterson, Polson, MT
Lander Purvis, Bozeman, MT
Chris Putzler, Kalispell, MT
Margaret Rossignol, Boulder, CO
Matthew Rubin, Saugus, CA
Katherine Saylor, Fall City, WA
Tonya Shepherd, Pineville, LA
Chris Spera, Dixon, IL
Susan Steckel, Winchester, IL
Zachary Stroker, Columbia
Becky Sundin, Baker City, OR
Christine Sundly, Great Falls, MT
Brian Swarthout, Bozeman, MT
Harold Taylor, Bidwell, OH
Neysa Thiele, MT, Zion, IL
Erin Trame, Ann Arbor, MI
Josh Underwood, Tollesboro, KY
Travis Vandenberg, Independence, MO
Jennifer Werda, Plymouth, NH
LeAnne Yenny, Bozeman, MT

2006 Graduates

Cheryl Abbott, Palmer, AK
Stacie Laducer Blue, Fargo, ND
Larry Boyd, Marysville, WA
Rich Calhoun, Lakeville, CT
Chuck Campbell, Russellville, AR
Dawn Carson, Shepherd, MT
Alicia Cepaitis, Fort Collins, CO
Sue Counterman, Littleton, CO
Randy Daniel, Huntsville, AL
Yvette Deighton, Sparks, NV
Lindsay Forsy, White, PA
Greg Gaffey, Beloit, WI
Amanda Gilbreath, Madison, AL
Tara Hall, Golden, CO
Laura Hauswald, Seattle, WA
Lauren Hinchman, Charlevoix, MI
Laura Holmquist, Bigfork, MT
Joanna Hubbard, Anchorage, AK
Margie Huber, Gahanna, OH
Ken Mager, Oak Forest, IL
Michael Magno, Monroe, NT
Steve McCauley, Boulder, MT
Kevin McChesney, Reynoldsburg, OH
Rebecca Mentzer, Columbus, OH
Kathy Meyer, Apple Valley, CA
Sherry Miller, West Coxsackie, NY
Gina Monteverde, Winthrop, WA
Leslie Morehead, Leslie, TX
Lori Ann Muchmore, Lolo, MT
Troy Nordick, South Jordan, UT
Kenny Peavy, Kuala Lumpur, Malaysia
Rhonda Phillips, Saskatchewan

Vasantha Prasad, Tamilnadua, India
Craig Richards, Calusa, CA
Brad Shuler, Elk Ridge, UT
Carla McFadden, Oroville, WA
Brad Shuler, Elk Ridge, UT
Diane Ripollone, Garner, NC
Brad Shuler, Elk Ridge, UT
Brian Sica, Idaho Falls, ID
Chris Straatman, New Holland, SD
Bonnie Streeter, Whitefish, MT
Brian Sullivan, Great Falls, MT
Michael Telling, Boulder, MT
Paul Tinger, Akron, OH
Genevieve Walsh, Bozeman, MT
Molly Ward, Bozeman, MT
Amy Washtak, Bozeman, MT
Deb Williams, Ames, IA
Rick Wyman, Hardin, MT
Besty Youngman, Phoenix, AZ

2007 Graduates

Serena Ayers, Springfield, NJ
Jason Barr, Charlotte, FL
Lindsay Bartolone, Chichago, IL
Lesley Chappel Bunch, Palmer, AK
Lisa Carpenter, Shepherd, MT
Mark Calhoun, Tucson, AZ
Jenifer Ceven, Avon, MA
Tonya Chapweske, Miles City, MT
Stacey Dobrosky Cool, Merced, CA
Victor Dalla Betta, Kalispell, MT
Bradley Deacon, Montoursville, PA
Dale Dennler, Cresco, IA
Bruce Dudek, Ashland, MT
Brooke Durham, Reynoldsburg, OH
Jane Fisher, Kingston, NY
James Flora, Pleasant Hope, MO
Jonathan Frostad, Olympia, WA
Kimberley Garner, Anchorage, AK
Jeffrey Gaston, Anchorage, AK
Kelly R. Gorski, Kelly, WY
Jeff Grom, Belgrade, MT
Angela Haas, Gardiner, MT
Marie Akers Hamaker, Cincinnati, OH
Lisa Hawkins, Taejon, South Korea
Kelly Hayden, Bozeman, MT
Shelia Higgins, Bentonville, AR
Bernard Hoczur, Daytona Beach, FL
Linda Jones, McLaughlin, SD
Julianne Kent, Bradenton, FL
Alexa Knight, Grants Pass, OR
Karla Laubach, Kingston, WA
Catherine Le, San Jose, CA
Rebekah Levine, East Burke, VT
Jean Lewis, Jackson, WY
Cooper Mallozzi, Leadville, CO
Jason Martin, Houston, TX
Jeffery Moll, Haverhill, MA
Michelle Marcil-Spicer, Houston, TX
Stephanie Parker, Tucson, AZ
Jacki Pealater, Willits, CA
Stuart Perez, Redfield, KS
Lisa Pingrey, Custer, SD
Cary Rosillo, Jupiter, FL
Patrick Simmons, Chesterfield City, VA
Michael Sitter, Polson, MT

Brian Stiff, Billings, MT
Rebecca Tolzman, Bozeman, MT
Nina Tyree, Alexandria, VA
Peggy Van Valkenburgh, Peterborough, NH
Michelle Vitko, Norwich, CT
Bryanna Vogt, Craig, CO
Christy Ware, Newtown Square, PA
Sharon Welter, Golden Valley, MN
Jenine Rued Winslow, San Diego, CA
Emily Wrubel, Peterborough, NH

2008 Graduates

Steven Alexander, Canton, NY
Jenelle Bailey, Wenatchee, WA
Marlessa Benson, Appleton, WI
Jennifer Brashear, Brunswick, GA
Matthew Bryant, Memphis, TN
Christopher Carucci, Boston, MA
Jennifer Crow, Mundelein, IL
Deborah Dilloway, Fairway, KS
Tracy Durish, Clarion, PA
Andrew Gelman, Westbrook, ME
John Getty, Bozeman, MT
Molly Godar, Rochester, IL
John Gordon, Weidman, MI
Paul Halfpop, Hardin, MT
Martin Hudson, Hannacroix, NY
Jill Hughes-Koszarek, Hartland, WI
Louise Jones, Naperville, IL
Tim King, Glide, OR
Jeffery Klipstein, Estes Park, CO
Sara Koffarnus, Westminster, CO
Jonell Prather, Missoula, MT
Charles Reade, Sacramento, CA
Laura Ritter, Royal Oak, MI
Franz Ruiz, El Cajon, CA
Kristina Sappenfield, Eagle, CO
Eric Sawtelle, Whitefish, MT
Donald Selusnik, Delavan, WI
Lisa Skilang, Marion, IA
Linda Smith, Missoula, MT
Kathryn Solberg, Sisseton, SD
Jennifer Swan, Sherman Oaks, CA
Angela Swanson, Rockford, IL
Nathan Whelham, Bothell, WA
Laura Wick, Palmer, AK
Kathleen Woldtvedt, Cut Bank, MT
Jaime Wolfe, Saginaw, MN
Wendy Worrall, Abbotsford, BC
June Wozny, Elkhorn, WI

2009 Graduates

Phillip Ammann, Wilmot, SD
Jenni Vee Andersen, Helena, MT
John Bell, Bozeman, MT
Callan Bentley, Annandale, VA
Carolyn Clark Bielser, Dillon, MT
Terry Carlsen, Walla Walla, WA
Aimee J. Chlebnik, W. Yellowstone, MT
Shelly Chrismon, Yoakum, TX
Christopher Cimino, Citrus Heights, CA
Brett Damerow, Hutchinson, MN
Natalie L. Davis, Livingston, MT
Meg DeAntoni, San Diego, CA
Jenny Derks-Anderson, Eugene, OR

2009 Graduates (Continued)

Thelma Devlin, Dededo, Guam
Lillian Edmon, Kamuela, HI
Ayn Eklund, Webster City, IA
Steve Eversoll, Kalispell, MT
Richard Fillerup, Driggs, ID
Thom Flinders, Holderness, NH
Elizabeth Fracchia, Glen Falls, NY
Doug Frost, Salen, NJ
Stacie Fry, Buenos Aires, Argentina
Victoria R. Ginsburg, Sandy, UT
Rob Greenberg, Chapel Hill, SC
Jenny S. Heckathorn, Valdez, AK
Patti Jelinek, Memphis, TN
Suzanna Johnson, Auburn, CA
Carlie J. Jones, Renton, WA
Michael E. Joyce III, Oak Bluffs, MA
Leslie C. Karpiak, Des Plaines, IL
Daniel Kinsey, Harlem, MT
Ron Koczaja, Fairbanks, AK
Lucy C. Karwoski Korpi, Holland, MI
Anton Kortenkamp, Monticello, MN
Thomas Kozikowski, Frostburg, MD
Kelly Kramer, DeForest, WI
Karen Kuchar, Naperville, IL
Jason Laducer, Belcourt, ND
Lon LaGrave, Baumholder, Germany
Am L. Manhart, Jackson, WY
Scott D. Masarik, Brussels, WI
Jean Philip Mathot, Irvine, CA
Rory Newcomb, Tallinn, Estonia
Lacy Noble, Three Forks, MT
Loralyn O'Kief, Valentine, NE
Lau Olsen, Sao Paulo, Brazil
Leslie Pierce, Barrow, AK
Mike Plautz, Missoula, MT
Ronald P. Ramsey, Sewanee, TN
Julie Kallio Robinson, Deerfield, MA
Laurie K. Rugemer, Bozeman, MT
Bruce Alexander, Sinclair, Bermuda
Todd M. Samson, East Helena, MT
Cathy Stierman, Dubuque, IA
Steve Sundberg, Moline, IL
Nathan Talafuse, Billings, MT
Lucinda Fisher Talsma, Sheldon, IA
Howard Tenenbaum, La Jolla, CA
Tana Verzuh, Durango, CO
Joe Le Weaver, Marion, NC
Patricia J. Weaver, Halifax, PA
Lisa M. Weeks, Eagle Lake, FL
Christine West, Haugan, MT
Erin Wilson, Honolulu, HI
Joe Wright, Hollis, NH

2010 Graduates

Aimee Flavin Artigues, Crested Butte, CO
James T. Ausprey, East Machias, ME
Carol Jane Baker, Billings, MT
Cheryl A. Barrientos, Denville, NJ
Susan H. Barton, Big Sky, MT
Robert David Baughman, Moss Point, MS
Randall Jay Berndt, Rosholt, WI
Susan Berrand, Salt Lake City, UT
Allen R. Bone, Pablo, MT
Christy Bone, Missoula, MT
Larene Bowen, Lame Deer, MT

Donna Brayfield, Springfield, IL
Linda Briggeman, Missoula, MT
Kelly P. Broderick, Bradenton, FL
Rebecca B. Burg, Dixon, MT
Katherine Burke, Helena, MT
Kara Ann Burrous, Sugar Land, TX
Anjali Devi Chandran, Napa, CA
Erika Christianson, Bozeman, MT
Jann C. Clouse, Missoula, MT
Stanley B. Covington, Beijing, China
Michelle A. Cregger, Chewelah, WA
Carrie Jo Dagg, Fairfield, IL
Quinn Michael Daily, Carbondale, CO
Bonnie E. Daley, San Francisco, CA
Ann Dannenberg, Newtown, MA
Tracy Ann Dickerson, Corvallis, MT
Aaron Eling, Sandy, UT
Stacey M. Ellis, Polson, MT
Dawn Nicole Estrella, Union City, CA
Janet C. Fenker, San Jose, CA
Devon M. Flamm, Hardin, MT
Michael J. Flamm, Hardin, MT
Emily M. Ford, Boyce, VA
Dennis Fulkerson, Lisbon, IA
Joshua Gates, Wilmington, DE
Cherri C. Gerber, Kelowna, British Columbia
Tim Germeraad, Flossmoor, IL
Lisa C. Green, Boyce, VA
Paula J. Groenveld, Harrisburg, SD
Jean Marie Kron Hagler, Savage, MT
Stephanie A. Hall, Rosebud, MT
Lisa Dawn Hart, Crested Butte, CO
Amy L. Haverland, Poesta, IA
Angie Hewitt, Bozeman, MT
Kathy Pickens Hirst, Ashland, MT
Seth A. Hodges, St. Michaels, AZ
Miranda Hollow, Charlo, MT
Katie E. Hubbell, Naperville, IL
Deb L. Hughes, Andalusia, AL
Dora M. Hugs, Pryor, MT
Cheryl Hugs, Pryor, MT
Thomas A. Ippolito, Coatsville, PA
Cathy L. Jamison, Wake Forest, NC
Sara Elizabeth Jay, Bozeman, MT
Pamela S. Kaatz, Sechelt, British Columbia
Margaret Kane, Prescott, AZ
Renee Kelch, Ronan, MT
Bonnie J. Keller, Blacksburg, VA
Rose Kent, South Royalton, VT
Lorna Sue Lange, 29 Palms, CA
Erin Kelly Lynch, Bozeman, MT
Mary L. Maier, Missoula, MT
Patrice Malamis, Rochester, IL
Dan McGee, Belt, MT
Amanda McGill, Clinton, MT
Stuart Miles, Asheville, NC
Tami A. Morrison, Polson, MT
Mary K. Osman, Newark, DE
Gerald Ott, Elverson, PA
Beth Peterson, Highland Park, IL
Alfred T. Poirier Jr., Dover, NH
Sarah S. Poletto, Naperville, IL
Anne Powers, Kingston, Ontario
Page-Marie Price, Lolo, MT
Holly Prull, Bend, OR
Tina L. Raeder van Stirum, Gonzales, CA
Nancy Farrington Reid, Natick, MA

Paul E. Robinson, Valhalla, NY
Susan R. Rolke, Rindge, NH
Melinda K. Rothschild, Parker, CO
Jeff Salter, Salt Lake City, UT
Scott Schafer, Weston, WI
Michael A. Schoenborn, Seattle, WA
Catherine Schuck, Missoula, MT
Debra Lea Schwake, Lodge Grass, MT
Justin L. Smith, Coatsville, PA
Karen M. Smith, Lame Deer, MT
Nichole Spindler, Bradford, PA
Jennifer Stadum, Bozeman, MT
James Stuart, Bozeman, MT
Bryna Thomson, Dallas, TX
Bill Thornburgh, Carmel, IN
Charlotte Waters, Vancouver, WA
Michelle Weber, Dubuque, IA
Nancy Wells, Saltsburg, PA
Heide Westwood, Hardin, MT
Sue White, Derby, KS
Gail Whiteman, Bozeman, MT
Deanna Rose Zerbe, Lodge Grass, MT

2011 Graduates

Melanie S. Acker, Ulysses, PA
Patti Rae Bartlett, Seeley Lake, MT
Jennifer Moore Bernstein, Portland, OR
Lindsay Paige Bower, Middleburg, VA
Brennan Brockbank, Fairfax, CA
Deborah Brown, Nyssa, OR
Nancy Lee Bryant, Burlington, NC
David Buck, Dixfield, ME
Joel Burgener, Lima, MT
Sandra J. Climenhaga, Albion, NY
Sarah Marie Connor, Kalispell, MT
Joann C. Dayton-Wolf, Kingston, NY
Joe DeLuca, Almere, The Netherlands
Joyce Dooley, Bentonville, AR
Katherine Echazarreta, Vienna, VA
Kendra Enoerth, Spokane, WA
Jonathan R. Ernst, Wentzville, MO
Eric Esby, West Hills, CA
Lane A. Fischman, Antioch, IL
Brandon Fritz, Williamsburg, IA
Jeremy Fuller, Wolfeboro, NH
Sheri Gates, Nagykovacs, Hungary
Ashley Gillespie, East Helena, MT
Tanya Gordon, Boise, ID
Amy M. Gramling, Hillsdale, MT
Heather M. Grant, Ojai, CA
Christopher Green, Painesville, OH
Christopher Gunderson, Absarokee, MT
Hadley Hentschel, Carbondale, CO
Susanne L. Hokkanen, Matteson, IL
Megan Hopkins, Naperville, IL
Daryl Allan Holst, Bangkok, Thailand
Jasper Howell, Afton, WY
Cheryl A. Hudson, Tifton, GA
An'juli Johnson, Billings, MT
Darren Kellerby, Anchorage, AK
Marty King, Legrand, IA
Shannon Knodel, Belgrade, MT
JoDe Knutson-Person, Bismarck, ND
Jacob L. Lame, Colorado Springs, CO
Maya A. Lampic, Chicago, IL
Karen L. Lund, Huntingdon, England

2011 Graduates (Continued)

Kathryn Madden, Beaufort, SC
Margaret K. Magonigle, Hanna, HI
Danny Mattern, El Dorado, KS
Emily McKenna, Belding, MI
Christian R. Mills, Rawlins, WY
Amiee L. Modic, Katy, Texas
Christopher G. Monsour, Tiffin, OH
Richard Montoya, Eureka, MT
Erik Nickerson, Boulder, CO
Cameron Novak, Fredericksburg, VA
Aaron Olmanson, Golden Valley, MN
Bradley Pederson, Belle Plaine, MN
Timothy D. Percoski, Bloomfield, CT
Janet E. Perry, Ashland, ME
Alanna Piccillo, Palisade, CO
Paul Pierre, Nassau, Bahamas
Erin Quintia, Columbia Falls, MT
Jonathan C. Reveal, Nashville, TN
Mary Seabrook Ritter, Bethlehem, PA
Seth Robertson, Renton, WA
Peter Rust, Wilmington, DE
Robin Scardino, Hong Kong, Hong Kong
Jessica F. Schultz, Culdesac, ID
Ralph E. Spraker, Jr., Columbia, SC
Marcie Steen, Mount Vernon, OH
Joyce Striclyn, Terre Haute, IN
Nancy Hoggard Talley, Tarboro, NC
Shaun Terry, Lovelock, NV
Katherine Theobald, Alexandria, VA
Marta Toran, Boone, NC
Jeanne Torske, Broadus, MT
Audrey Urista, Winston, OR
Shari F. Ward, Ashland, ME
Tom Wellnitz, Johns Creeks, GA
Matthew Wigglesworth, Honolulu, HI
Jennifer Williams, Honolulu, HI
Andrea Gissing Yordan, Philadelphia, PA

2012 Graduates

Jessica Anderson, Deer Lodge, MT
Tanya M. Anderson, Hardin, MT
Tom Anderson, Twin Valley, MN
Donald James Asbury, Lame Deer, MT
Kathy Aune, Frenchtown, MT
Kristian Basaraba, Sherwood Park, AB, Canada
Luke Beall, Fairview, PA
Adam Bohach, Clinton, IA
Jason Boss, Bellflower, CA
Angie Brist, Traer, IA
Jodi L. Brokaw, Hardin, MT
Robin A. Cameron, Jackson, WY
Lorilyn A. Chapman, Livingston, MT
Katherine Chesnutt, Boone, NC
Joanna Chierici, East Windsor, NJ
David Chimo, Corvallis, MT
Natasha L. Cleveland, Frederick, MD
Erin Colfax, Morristown, NJ
Jordan Lacy Cook, Lakewood CO
Matthew Cornelius, Lingle, WY
Jennifer Courtney, Mason, OH
Karla B. Cramer, Florence, MT
Tom Davies, Weston, WI
Kristina Davis, Potomac, MT
Jeffrey Edwin DeGlopper, Milwaukee, WI
Joshua Dennis, Dover, PA
Kim Devore, Manhattan, MT

Heather G. S. Deitz, Regina, Canada
Kaye Ebel, Missoula, MT
Nathan R. Fairchild, Redding, CA
Jessica Felchle, Billings, MT
Amy Flindt, Roseville, CA
Ryan Foley, Great Falls, MT
Rebecca Beacham Fulk, Steamboat Springs, CO
Jason Getz, Woodberry Forest, VA
Kellina Gilbreth, Colorado Springs, CO
Vanessa Nashee Green, Lawrenceburg, TN
Lori Hacck, Kremmling, CO
Charlotte Hagerman, Eagar, AZ
Shawna Halsey, Billings, MT
Angela J. Hammang, Dillon, MT
Michelle Hammond, Lake Worth, FL
Jeremy Harder, Big Sky, MT
Yvette Strandell Hart, Hastings, NE
Annie Hesterman, Westminster, CO
Brian Holtzhafer, Orefield, PA
Brandon Honzel, Missoula, MT
Angie Hopwood, Superior, MT
Laura Hovland, Bozeman, MT
Jessica Hughes, Arlee, MT
Douglas Martin Janeczko, Goshen, NY
Jennifer Jones, Ogallala, NE
Alan Kalf, Lexington, MA
Mark Kellogg, Camdenton, MO
Batya Kinsberg, Eaglewood, NJ
Leah M. Knickerbocker, Bozeman, MT
Karyn Ann Kretschmer, Genoa City, WI
Charla Lake, Ronan, MT
Mary Larson, Polson, MT
Ann Leach, Leavenworth, WA
Candice M. Lommen, Mapple Valley, WA
Hilary M. Lozar, Roman, MT
Hermes Lynn, Livingston, MT
Jill D. Mahoney, Fairfax, VA
Sibley A. Malee-Ligas, Arlee, MT
Kasey Marks, Missoula, MT
Cara Marlowe, Dubai, United Arab Emirates
Joy Mayer, Green Bay, WI
Colleen Marie McDaniel, Houston, TX
Miles McGeehan, Manhattan, MT
Randy Metzger, Orwigsburg, PA
Robert Moyer, Birstol, PA
Susannah Spradlin Murphy, Frenchtown, MT
Jennifer Narimatsu, Bremerton, WA
Kimberley Orr, Lethbridge, AB, Canada
Alisha Pablo, Hot Springs, MT
April Peterson, North Bay, Ontario, Canada
Sadie Peterson, Silver Springs, MD
Melinda Reed, Florence, MT
Marcie Reuer, Grande Cache, AB, Canada
Joe M. Ruffatto, Great Falls, MT
Marco Santarelli, New Fairfield, CT
Michele Schaub, Crow Agency, MT
Anne Farley Schoeffler, Hudson, OH
Rachel Srenar, Bozeman, MT
Matthew J. Shargel, Walnut Creek, CA
Jennifer Sherburn, Hesperia, MI
Aaron Shotts, Mechanicsburg, PA
Carolyn Slagle, East Helena, MT
LaCee Small, Ashland, MT
Dale Spady, Westlake Village, CA
Stephanie Statema, Park Ridge, IL
Lauren Stepro, Norfolk, VA
Lisa Russell Stevens, Crow Agency, MT

Reba K. Storm, Hardin, MT
Melissa Anne Sullivan, Carlsbad, CA
Clinton Swartz, Middleburg, PA
Robin Tillman, Cranbrook, Canada
Brandy L. Thrasher, Missoula, MT
Lizabeth A. Townsend, East Helena, MT
Molly Russell Underwood, Redwood City, CA
Jay Walls, British Columbia, Canada
Tylene M. Walters, Manhattan, MT
Paula Wang, Poplar Island, MD
Lee Weldon, Missoula, MT
Rachel M. White, Belgrade, MT
Wendy D. Whitmer, Spokane, WA
Beth Workman, Bainbridge, OH
Rachel Lee Zupke, Seattle, WA

2013 Graduates

Georgia Alvarez, Vancouver, WA
Kelly Arnold, Clarksville, TN
Suzanna Barnhart, La Crosse, WI
David Bates, San Francisco, CA
Charles Benson, Bellevue, NE
John Bishel, Port Allegany, PA
Dana Blomquist, Helena, MT
Andrew Bright, Gabrills, MD
Tina Brothers-Tillingier, Helena, MT
Jennifer Bruns, Juliaetta, ID
Joe Clark, Carson City, NV
Carrrie Clement, Helena, MT
Judith Coats, Eldorado del Mar, CA
Crystal Cornwell, Ronan, MT
Brooklyne Coulter, Strasburg, CO
Joe Crider, Helena, MT
Emily Currier, Helena, MT
Janeen Curtis, Darby, MT
Jennifer Curtis, Rockport, ME
James Davies, Ridgefield, WA
Caleb Dorsey, Loyalton, CA
Pamela Drescher, Culver City, CA
Amy Dushane, Yuba City, CA
Lori Egan, Thornton, CO
Holly Faris, Hamilton, MT
Laura Feldkamp, Wichita, KS
Tyler Ferebee, Pawnee City, NE
Jason George, Notus, ID
Lance Gerow, Riyadh, Saudi Arabia
Dale Glass, Potomac, MD
James Glynn, Chicago, IL
Rachel Grey, Winnsboro, LA
Taylor Green, Red Lion, PA
Michael Greenhoe, Kandern, Germany
Courtney Harrell, Peyton, CO
Michael Helseth, Yakima, WA
Robin Henrichs, Mc Cook, NE
Benjamin Heyde, British Columbia, Canada
Alice Hinck, Broadus, MT
Jennifer Hood, Dayton, TN
Jeanna Jasperson, Montrose, CO
Beverly Jaworski, Burtonsville, MD
Tamara Jendro, Helena, MT
Susan Johnson, Southbury, CT
Shari Juroszek, Bozeman, MT
Kevin Kenealy, Nevada, IA
Linda Kocian, Elk Grove Village, IL
Amanda Kozak, Ashland, OH
Scott Lannen, Phoenix, AZ

2013 Graduates (Continued)

Robert Lee, Shelby, MT
Brett Lehner, APO, CA
Heather Leiberg, Helena, MT
Martha Lord, Hamilton, MT
Doug Lymer, Houston, TX
Dalton McCurdy, Fairfield, CT
Julie McDonnell, Oak Park IL
Heather McWhorter, Las Vegas, NV
Murry Metge, Great Falls, MT
Ashley Milbrandt, Helena, MT
Julie Morris, Peotone, IL
John Nilsen, Dhahran, Saudi Arabia
Laura Patch, Brevard, NC
Brian Phillips, Rabun, GA
Dorcella Plain Bull, Crow Agency, MT
Mary Ragusa, Bloomingdale, IL
Jayanthi Ramakrishna, Chennai, India

Chris Reidburn, Watertown, SD
Stacey Rhodes, Waynesville, MO
Andrea Robbins, Buhl, IN
Christopher Rocheleau, Southington, CT
Pablo Rojo, Brooksville, FL
Sally Sanders, Tallahassee, FL
Josie Shern, Bozeman, MT
Charles Shields, Greencastle, ID
Judith Silva, Franklin, ME
Michelle Slaughter, Lincoln, CA
Matthew Sloan, Glenview, IL
Adam Smith, Sioux Falls, SD
Charles Strobino, APO, Germany
Angela Swank, Livermore, CA
Chris Swiden, Watertown, SD
Sarah Tabor, Bozeman, MT
Kenneth Taylor, Bozeman, MT
Carol Teintze, Bozeman, MT
Zachary Thomas, Mountainburg, AR

Jacob Thompson-Krug, Omaha, NE
Kristina Troge, Doral, FL
Dina Tucker, Austin, TX
Jennifer Vaughn, Houston, TX
Carrie Wager, Medina, OH
Cindy Watson Pottebaum, Winterset, IA
Mary Ann Watt, Concord, NH
Irene Wilcox, Clearwater, MN
Danielle Wilczak, Clearwater, MN
Suzanne Wilson, Olympia, WA

2014 Spring Graduate

Shannon Greco, Princeton, NJ

2014 Science Education Symposium Schedule

<u>Presenter</u>	<u>Room</u>	<u>Date</u>	<u>Time</u>	<u>Presenter</u>	<u>Room</u>	<u>Date</u>	<u>Time</u>
Abernethy, Joshua	Reid 101	June 30th	12 PM	Lords, Quincie	Reid 101	June 30th	1 PM
Bailey, Deanna	Reid 102	June 30th	2 PM	Love, Nicolai	Reid 101	July 5th	1 PM
Bernard, Mariann	Reid 101	July 1st	2 PM	Lundgren, Lisa	Reid 102	July 3rd	2 PM
Blome, Marcia	Reid 102	July 5th	10 AM	Lynch, Robert	Reid 102	July 2nd	4 PM
Bratka, James	Reid 101	July 2nd	1 PM	Mannix, Logan	Reid 101	July 3rd	1 PM
Brown, Dean	Reid 102	July 1st	5 PM	Martens, Krista	Reid 102	July 2nd	3 PM
Burns, Cameron	Reid 102	July 2nd	5 PM	McClellan, Matthew	Reid 102	July 3rd	3 PM
Caditz, Joshua	Reid 101	July 3rd	5 PM	McCormick, Doralee	Reid 102	July 1st	12 PM
Catlin, Irene	Reid 101	June 30th	10 AM	McGrath, Ashley	Reid 101	July 3rd	12 PM
Clay, Matthew	Reid 102	July 1st	9 AM	McHugh, Casey	Reid 101	July 1st	5 PM
Coates, Kara	Reid 102	July 3rd	11 AM	McMullan, Candace	Reid 102	July 3rd	1 PM
Croft, Justi	Reid 101	July 3rd	9 AM	Mercer, Dawn	Reid 102	July 2nd	10 AM
Davis, John	Reid 101	July 5th	7 AM	Meredith, Mark	Reid 101	July 1st	3 PM
Dingler, Coreen	Reid 102	July 3rd	8 AM	Mingles, Mary	Reid 101	July 1st	9 AM
Dobson, Rebecca	Reid 102	July 3rd	9 AM	Mitchell, Heather	Reid 102	July 1st	10 AM
Dooling, David	Reid 101	July 2nd	7 AM	Mohr, Stephen	Reid 102	July 2nd	8 AM
DuBrow, Daniel	Reid 102	June 30th	12 PM	Noblejas, Jeffrey	Reid 102	June 30th	11 AM
Duncan, Chance	Reid 102	July 3rd	12 PM	Ojala, Eric	Reid 102	July 1st	3 PM
Dusenberry, Camilla	Reid 102	June 30th	10 AM	Otruba, Sherry	Reid 101	July 1st	7 AM
Fields, Stephaie	Reid 102	July 3rd	7 AM	Pokley, Kal	Reid 101	July 1st	12 PM
Generaux, Shari	Reid 101	July 3rd	11 AM	Poser, Michael	Reid 101	June 30th	3 PM
Gibbs, Elaine	Reid 101	July 5th	10 AM	Powers, Lynn	Reid 101	June 30th	9 AM
Grotbo, Sara	Reid 101	July 5th	9 AM	Redmond, Katie	Reid 102	July 3rd	10 AM
Guajardo, Lily	Reid 102	June 30th	1 PM	Rowland, Randy	Reid 101	June 30th	2 PM
Haack, Matthew*	Reid 101	July 3rd	10 AM	Schaefer, Pamela	Reid 102	July 5th	1 PM
Haas, Jacquelyn	Reid 101	July 5th	3 PM	Scott, Christina	Reid 102	June 30th	3 PM
Heisler, Jennifer	Reid 102	July 2nd	12 PM	Shaw, Kaylee	Reid 101	July 3rd	7 AM
Herdina, Kyle	Reid 102	July 5th	11 AM	Shawli, Ahmed	Reid 101	June 30th	5 PM
Hronek, Analea	Reid 102	July 2nd	9 AM	Smith, Carol	Reid 101	July 3rd	8 AM
Iloff, William*	Reid 101	July 5th	11 AM	Smith, Jennifer	Reid 101	June 30th	11 AM
Jenkins, Angela	Reid 101	July 2nd	11 AM	Sumner, Garold*	Reid 101	July 1st	10 AM
Jessen, Heidi	Reid 102	July 5th	2 PM	Tang, Michael	Reid 101	July 1st	1 PM
Jones, Christine	Reid 101	July 2nd	5 PM	Thompson-Krug, Melissa	Reid 102	July 2nd	2 PM
Jongeward, Alecia	Reid 102	July 2nd	1 PM	Thongvanh, LeAnne	Reid 101	July 1st	8 AM
Ketchen, Carisa	Reid 102	July 5th	3 PM	Tinkler, Rachel	Reid 102	July 5th	9 AM
Konrad, Terina	Reid 102	July 1st	11 AM	Tully, Donna	Reid 101	July 2nd	3 PM
Koper, Donald	Reid 101	July 2nd	9 AM	Vasquez, Jessica	Reid 102	July 5th	12 PM
Latif, Marka	Reid 102	July 5th	8 AM	Wallace, Christina	Reid 101	July 3rd	3 PM
Lilley, Scott	Reid 102	July 1st	8 AM	Wells, Jocelyn	Reid 101	July 1st	11 AM
Long, Tanya	Reid 102	June 30th	9 AM	Whitmer, Clinton	Reid 101	July 2nd	2 PM

*Will present Summer 2014 but graduate at a later date

**Scheduled to present outside of Capstone Week: Katie Koessler

