

2012 Minnesota Conference on Science Education

Find more conference information at www.mnsta.org

Biology

Adapt Meaningful Ecology Investigations To Any Ecosystem!

Mary Spivey, U of MN Cedar Creek Ecosystem Science Reserve

D. C. Randle, St. Francis High School

Adapt a hands-on ecology investigation, comparing the abiotic and biotic parameters of various ecosystems, to the resources surrounding your school or local nature center.

BIOLOGY STRAND SPEAKER **Herd Immunity and Strategies for Evading the Next Pandemic.**

Dr. Benjamin Clark, University Of Minnesota

Crazy Traits and Adaptations: Genetics Games for All

Jessie Herman, CPO Science

Use a one-of-a-kind creature building system to learn great classroom ideas for the concepts of genes, traits, heredity, and adaptations. Free raffle for Crazy Traits kit!

Does Music Really Effect Plant Growth?

Rita Schwieters, St. Cloud State University Pre-service Teachers

Arick Then, St. Cloud State University

Rosana Molina, St. Cloud State University

Tchaikovsky or Dubstep? Why do some experiments show plants growing better when subjected to noise? This is a presentation of our findings on this topic and how an experiment like ours can be duplicated in a classroom.

FOOD ? the Science from Farm Field to Fork

Sue Knott, Minnesota Agriculture in the Classroom

Students love food? Discover the science involved in producing it! Participants will complete a standards-based, hands-on activity applicable to a wide range of learners. Resources focusing on food production and gardening will be shared.

Immune Cells Brought to Life

Megan Hall, Open World Learning Community

A series of active lessons teaching the structures and functions of immune cells, culminating in a project differentiated through Multiple-Intelligences Theory.

Outdoor Education and Activities for everyone: One School's experience with a School Forest and Outdoor Classrooms

Robin Halverson, Forestview Middle School/ Isd 181 Brainerd Schools

Chris Hanson, Forestview Middle School/ Isd 181 Brainerd School

We will share our experiences in designating a School Forest, the many uses and benefits of outdoor learning in all content areas, and helpful resources to make your forest a special place for students, staff and the community.

STEM Project Lead The Way Biomedical Science Program

Nancy Berg, East Ridge High School

The purpose of this presentation is to introduce Project Lead the Way (PLTW) STEM Biomedical Science Program to science teachers throughout Minnesota in order to promote STEM education

Teaching About Our Human-made World

Clayton Russell, Northland College

Take part in hands-on activities that explore how our species' population has expanded to dominate the Earth and remake the natural world in unprecedented ways.

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Chemistry

CHEMISTRY STRAND SPEAKER

Research of Natural Organic Matter (NOM), its Chemical Activity and Fate in Aquatic Ecosystems Like Lake Superior

Dr. Elizabeth Minor, Large Lakes Observatory

"Wading Into The Wetlands"- Interfacing STEM and Environmental Science

*Charles Handlon, Century High School
, Century High School*

AP Chemistry students participate in STEM research in collaboration with an Environmental Learning Center. Ideas will be shared how to develop and implement STEM projects like this.

Earth Science

Dragonflies and Damselflies as Educational Tools

Ami Thompson, Ami Thompson Consulting LLC

Dragonflies and Damselflies have been fascinating humans for thousands of years and are a fantastic tool to engage students. They can be found anywhere water is near, are easy to catch, and don't sting or bite (very hard). From historical dragon lore to scientific identification and citizen science reporting, in-depth study of the order Odonata can benefit all classrooms. This workshop will include a bit of background knowledge, a lot of hands-on and technological exploration, and a bunch of classroom activities to bring home. This is a shortened version of a half-day workshop offered by Ami Thompson Consulting LLC. Participants in this workshop will receive a discount coupon if they wish to attend the full Odonata Workshop in the future.

EARTH SCIENCE STRAND SPEAKER

Roadside Geology

Dr. Richard Ojakangas, University of Minnesota, Duluth

Inquiry-Based Software for Exploring Topics in Meteorology and Astronomy

William Jasperson, Riverside Scientific, Inc.

Student-based software for the exploration of Seasons, Winds, Clouds, Weather Systems, Phases of the Moon, Eclipses, and Motion in the Sky.

Inspire Learning: How to Set Up an Outdoor Classroom at Your School

Laura Duffey, MN DNR

Amy Kay Kerber, MN DNR

Learn how to establish an outdoor classroom ? a place where students and teachers are engaged by lessons, learn science, build a sense of community, and address nature deficit disorder. Discuss the Why, What, Where, How, and Who of establishing an outdoor classroom. Sites can be small (1/4 acre) or large (100 acres) and might have trees, prairie, wetlands, or urban features. Programs that support outdoor classrooms will be discussed, including the School Forest Program which provides support to meet individual school needs.

Payloads to Near Space

Susan Fourniea, Battle Creek Middle School/St. Paul Public Schools

Our middle school science classes sent four payloads into near space with four different experiments on board with the partnership of Dr. James Flaten of the University of Minnesota.

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Elementary

ELEMENTARY STRAND SPEAKER **SciGirls: How to Engage Girls in STEM**

Dr. Lisa Regalla, Twin Cities Public Television

Innovations in Elementary Science

Mark Miller, St. Louis Park High School/District 283

Erica Lenzen, St. Louis Park High School/District 283

Pat Hartman, St. Louis Park High School/District 283

Learn about District 283's unique and innovative program for increasing learning and motivation in elementary science.

It' Not Magic, It's Science!

Jerry Wenzel, Retired

Join wacky professor Jerry Wenzel as he demonstrates science concepts in a fun and easy-to-understand way. This will be an unforgettable science learning experience for you and will change the way you teach science. He guarantees your students will be asking for more science!

Making Science Connections for Student Learning Across the Curriculum

Laurie Arnason, South Point Elementary

Enhance your teaching and your students' learning by engaging in outdoor journaling. By using a prairie and/or a butterfly garden (or any outdoor ecosystem) as a focal point, you will learn how to integrate the many disciplines that get sidelined in your classroom.

Prizes to be given.

Open The Door,Let's Explore:Seasonal Activities For Young Children

Polly Saatzer, Garlough Environmental Magnet School,PAEMST Awardee for Science 2010

Get some practical ideas for nature hikes, using backpacks with homemade tool,setting up simple inquiry investigations outside and inside the classroom and ongoing seasonal observation activities.

Roll Into Engineering With Kindergarteners

Jill Jensen, Glacier Hills School of Art and Science

Holly Fournier, Glacier Hills School of Art and Science

Learn how kindergarten students become engineers through examination of the properties of materials and how objects move. Participants will try a portion of the unit first hand and learn resources to support the lessons.

STEM Integration: The Who, What, Where, When and Why

Cathy Kindem, Cedar Park STEM Elementary School

Interested in improving your skills at developing and delivering STEM teaching? This presentation will explore ways to make connections between the STEM content areas to support learning and teaching standards.

What is Engineering? plus the Engineering Design Process

Heidi Eschenbach, The Works

This workshop will explain what engineering is and give you the experience and confidence to do design challenges with your students. Includes trying out an engineering challenge for yourself with our Pasta Bridge challenge.

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General

Biophilia and the K-12 curriculum: Will our students be the last children in the woods?

Jack Judkins, Minnesota Department of Natural Resources: Minnesota Conservation Volunteer

This presentation will explore resources, such as "Young Naturalists" articles from the Minnesota Conservation Volunteer magazine, that teachers can use to nurture the "innate tendency to focus on life and lifelike processes." (Wilson, 1984)

Brilliant but Busted: using superseded theories to engage students in science and history

David McGill, Capitol Hill Gifted and Talented School

Theories of brilliant scientists sometimes turn out to be wrong. How can we use errant ideas from the history of science to teach basic concepts?

Energize Your Classroom: Youth Energy Summit (YES!) & Much More

Anne Dybsetter, Prairie Woods Environmental Learning Center (YES!)

Rebecca Bell, Southwest Initiative Foundation (YES!)

Learn how energy education brings best practices to your teaching: experiential activities about renewable energy; environmentally-responsible service learning ideas; community & curriculum resources; and real-world impacts that energize students.

Engineering - It's not just for physics!

Claire Hypolite, Edison High School

An adapted version of the classic tank-emptying problem will be presented, including ways of using it to meet engineering standards in most science classes.

Engineering NASA Style

Margaret Schmitz, Willmar Area Learning Center

Rob Flegel, Willmar Senior High

This project focuses on solving a real world problem that is being tested at NASA Ames Research Center. Inquiry is a major part.

Explore Minnesota's Changing Climate

Kristen Poppleton, Will Steger Foundation

During this session educators will be introduced to and receive copies of the Will Steger Foundation's new Minnesota's Changing Climate curriculum and online classroom.

Flight;"History to Next Generation" An engineering unit based on Simulations and Materials from NASA.

Ben Panchyshyn, Willmar Public Schools

John Kuznik, Willmar Public Schools

This presentation will summarize an aerospace engineering lesson unit created while participating in the SimAero Teacher Professional Development Program at the NASA Ames Research facility July, 2011.

For Love of Lakes by Darby Nelson

Darby Nelson, Anoka Ramsey Community College-retired

Geri Nelson, Champlin Park HS-retired

We love lakes yet cause their deterioration. The new book, For Love of Lakes, explores the paradox. Lack of knowledge? Innate habits of mind? Cognitive drivers? Flawed perception?

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Fun Physics for All with the Marble Launcher

Jessie Herman, CPO Science

Perform engaging projectile motion investigations with a fun and unique marble launcher. Free raffle for a marble launcher!

Immerse Your Students in STEM ? Get them in the ?Habit-at? with MinnAqua

Nadine Meyer, MN DNR MinnAqua Program

Michelle Kelly, MN DNR MinnAqua Program

Roland Sigurdson, MN DNR MinnAqua Program

Immerse your students in STEM with a hook - fishing! The Fishing: Get in the Habitat! Leader's Guide provides hands-on lessons that utilize fun activities to get students problem solving and involved in real science. Participants will receive our free curriculum and engage in make & take activities.

More Than the Syllabus: Using a Teacher Website to Meet the Needs of all Students

Jamin McKenzie, Battle Creek Middle School

Chris Alper-Leroux, Battle Creek Middle School, St. Paul, MN

Create a website that interactively engages, reinforces key concepts, formatively assesses, and differentiates for all students. Make your class available 24/7!

NAEP Questions Tool - Practical Uses

Kate Beattie, MN Dept of Education

This presentation will demonstrate how to use the NAEP Questions Tool to pull out Science information for Grades 5, 8 and 12, including released NAEP questions from previous NAEP assessments along with item information, rubrics, and how students actually performed on the questions.

Nano Nano: The Science of the Small

Anika Taylor, The Bakken Museum

Danni Dancer, The Bakken Museum

Anika Taylor,

Make some tiny discoveries with big implications as The Bakken provides an introductory program on nanoscale science and technology through our Science Assets framework.

NASA Opportunities and How to Successfully Apply

Margaret Schmitz, Willmar Area Learning Center

Rob Flegel, Willmar Senior High

John Kuznik, Willmar Middle School

We will discuss from a knowledgeable point of view the resources and opportunities available at NASA and how to succeed in applying.

National Board Certification - Yes You Can!

Libby Sandvick, Edina Public Schools

Thinking about exploring the NBC process? This informative session will outline the NBC process (initial certification and renewal) and provide ample time for questions.

PAEMST Presidential Award Excellence Math Science Teaching Application Process

Nancy Berg, East Ridge High School

The purpose of this presentation is to outline and describe the application process for the Presidential Award of Excellence in Math and Science Teaching.

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Proctor's Green Takeover

Diane Podgornik, Proctor Schools

Proctor Schools have an active environmental group called the "Green Bandits". Our focus has been to reduce our energy usage, decrease our garbage, increase our recycling, and increase our environmental awareness. Come and hear our story and meet some of our students.

Promoting Girls in Engineering, Math and Science

Megan Heitkamp, Salk Middle School

Kelly Prusak, Salk Middle School

This presentation will provide tried and true, interactive lab activities and start-up resources for facilitating a hands-on, minds-on science club for girls.

Science and Science Education Research Poster Presentations

Michele Koomen, Gustavus Adolphus College

This session will feature original research presented as a research poster from future science teachers of Minnesota. Come hear future teachers talk about the subject/problem they explored including their study design, research findings and implications and relevance to MNSTA conference attendees.

Science Notebook Techniques: Round Table Discussion

Amanda Meyer, Springfield High School

Jayme Fast, Springfield High School

Amanda Meyer,

The presenters teach a variety of life science and physical science classes at their high school, all of which use notebooks in different ways. They will share some of the techniques that make notebooks successful in their classrooms, as well as samples of student work. Teachers who currently use notebooks are encouraged to attend this session to share their ideas as well.

Shifting to an inquiry-based, team-lead classroom.

Claire Hypolite, Edison High School

The presenter will show how using inquiry-based lessons and team-based learning have shifted her classroom from teacher-led to teacher-facilitated learning.

Ten Things Everyone Should Know About The Atmosphere

Cherie Bornhorst, Colorado State University, Little Shop of Physics

Join the Little Shop of Physics and explore the physics of weather and climate concepts. Learn why the sky is purple and how the earth gets more energy from the sky than the sun through hands-on, inquiry-based activities you can use in your classroom that can be adapted to any grade level! You will leave with activities directly related to Minnesota Science Standards, lots of awesome ideas and cool give-aways!

The Digital Classroom with Discovery Education Science Techbook: What Does It Look Like?

Trinette Green, Discovery Education

Ready to incorporate digital media but not sure how? Regardless of how many computers you have in your classroom it CAN be done!

Using Technology for All It's Worth

Peter Johnson, Minneapolis Academy

Classrooms are filling up with expensive technology. Learn how to take advantage of the plethora of free resources available to every classroom with a projector or SmartBoard.

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Welcome to your first Science Education Conference!

Michele Koomen, Gustavus Adolphus College

Melanie Reap, Winona State University

Come join us to learn more about the Minnesota Science Teacher Association, how to navigate your first conference and get the most out of your first Minnesota Conference in Science Education.

ZooMS: Teaching Math, Science, and Engineering at the Minnesota Zoo

Carol Strecker, Minnesota Zoo

Discover unique and engaging engineering-themed activities that get your students thinking about what happens behind-the-scenes at the Minnesota Zoo? through the Zoo's new ZooMS program!

Physics

Bridging into Engineering: building structural engineering into a science curriculum

Deborah Besser, CPCEE University of St. Thomas

, CPCEE University of St. Thomas

Do you have questions about the engineering behind the building activities you currently incorporate (or would like to incorporate) into your science classes? This session, led by a structural engineer, will review relevant MN science standards, theory behind structural engineering, and provide relevant activities.

Correlating Emerging Technology Applications with Traditional Sciences

Deb Newberry, Dakota County Technical College

Billie Copley, Dakota County Technical College

Emerging technologies such as photonics and nanotechnology offer exciting career opportunities for students and new materials for instructors to use in student activities and labs. This presentation will provide hands on examples of emerging technologies that can be used to strengthen student understanding of science concepts. Correlation to standards and student outcomes will also be discussed.

Dark Matter, Quantum Theory, GPS, and Relativity, O My!

Nancy Bynum, Rogers High School

FREE NEW MATERIALS (DVD's, teacher packet with answers, students activities/labs to use) FROM THE PERIMETER INSTITUTE. Come in and see what you are missing:) We will sign up for future updates as well.

General Relativity - How to think like Einstein

Steve Heilig, St. Paul Academy and Summit School

General Relativity is one of the pillars of physics, yet it is rarely taught at the high school level. But it engages students, they appreciate how the universe really works, and is simply fun. We'll look at the ideas and see demonstrations that can help you (and your students) think like Einstein.

Modeling physics

Nancy Bynum, Rogers High School

YOU:),

Get together with other teachers using modeling and have the opportunity to collaborate with them. Please feel free to bring any ideas you wish to share.

Physics licensure and the MTLE Physics exam

John Truedson, Bemidji State university

Physics Teaching is one of the primary shortage areas in Minnesota. This presentation will be for science teachers interested in passing the MTLE physics exam in order to be licensed physics teachers.

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Physics Sharing/Make and Take

Chris Ann Johnson, Apollo High School

Mike Maas, Eden Prairie High School

Participants in this session will bring their favorite physics demonstration or lab to share. Please bring electronic copies of any handouts or copies to share at the session. In addition, there will be at least one "make and take" that participants will be able to use in their classrooms.

PHYSICS STRAND SPEAKER

Flipped classroom: What Is It and What Isn't It?

Dr. Andy Rundquist, Hamline University

We will discuss what flipping the class is all about, concentrating on the pros, cons, and logistics of video resources created by you for your students.
