



DIRECTIONS TO ALLENDALE CAMPUS

Registration (Continental Breakfast) 8:00 a.m. - 8:30 a.m.

Sessions

A	8:30 a.m.
B	9:45 a.m.
C	11:00 a.m.
Lunch	12:00 - 12:45 p.m.
D	12:45 p.m.
E	2:00 p.m.

Special Exhibits

Great Lakes Geoscience
Rock and Mineral Display and Sale
8:00 a.m. - 3:00 p.m.

GVSU Atomic Object Technology Showcase
012 Mary Idema Pew Library (Lower Level)
10:00 a.m. - 9:00 p.m.

CONFERENCE SCHEDULE

NONPROFIT ORG
US POSTAGE
PAID
GRAND VALLEY
STATE UNIVERSITY

GRAND VALLEY
STATE UNIVERSITY
Regional Math and Science Center
C-1-120 Mackinac Hall
1 Campus Drive
Allendale, MI 49401-9403

October 2016

Dear Educator,

The Regional Math and Science Center cordially invites you to the 32nd annual Fall Science Update conference! This year's theme is "Implementing STEM by Design." With Michigan adopting new science standards, we are breaking new ground in implementing the disciplinary core ideas, crosscutting concepts, and science and engineering practices into our classrooms. Why? Because we want our students to be able to *inquire, think, investigate, and innovate* while preparing for their future.

Implementation of the new standards includes everyone. As such, new to this year's conference we are adding an Administrator Strand (watch for the oak leaf in the session section of the brochure).

We are honored to have the following three keynote speakers:

- **Tracy Horodyski**, Instructional Coach for Kenowa Hills Public Schools and Michigan Department of Education 2016-17 Teacher of the Year, for the Elementary Keynote;
- **Kevin Sylvester**, Grand Haven Lakeshore Middle School science teacher, for the Secondary Keynote; and
- **James Emmerling**, Director of the Genesee Area Math/Science Center, for the Administrator Keynote.

In addition to the keynotes, Fall Science Update will hold five 60 minute elementary and/or secondary breakout sessions on topics including technology, science content, standards, pedagogy, and informal science. You are welcome to bring your internet device! Wifi will be available.

All registration is online this year at gvsu.edu/s/DX. Lunch is included in the conference registration fee.

Whether you are new to the conference or a returning teacher, Fall Science Update provides the opportunity for you to grow as a professional and network with colleagues. We look forward to your participation. Please call 616.331.2267 with any questions.

Sincerely,

Karen Meyers, Director
Regional Math and Science Center

Kathy Agee, Science Program Coordinator
Regional Math and Science Center

Conference registration is exclusively online at www.gvsu.edu/s/DX
Cost to attend:
\$45 per person
\$20 per undergraduate student with lunch
\$10 per undergraduate student without lunch

CONFERENCE REGISTRATION

Administrator Address 8:30 a.m.
PL@N A1: Supporting a Framework
Aligned Vision of Instruction
James Emmerling
James Emmerling is the director of the Genesee Area Math/Science Center. On the Board of Directors for the Michigan Mathematics and Science Centers Network, he serves as the Science Professional Development Chair.



Secondary Address 12:45 p.m.
Don't Teach My Daughter Science; Teach Her to be a Scientist
Kevin Sylvester
Kevin Sylvester is an 8th grade science teacher at Lakeshore Middle School with Grand Haven Public Schools. He also works as a biological technician with a lake consulting firm, addressing the problems caused by aquatic invasive plant species.



Elementary Address 11:00 a.m.
Helping Students Bloom into Innovators by Focusing on the Root of STEM: Literacy
Tracy Horodyski
Tracy Horodyski is a reading interventionist and literacy coach with Zinser Elementary in Kenowa Hills Public Schools and is a member/presenter for the Literacy Coaches Network with Kent ISD.



2016 FALL SCIENCE UPDATE CONFERENCE KEYNOTES



2016 FALL SCIENCE UPDATE A CONFERENCE FOR K-12 EDUCATORS

IMPLEMENTING STEM BY DESIGN

WEDNESDAY, NOVEMBER 16, 2016
8 a.m.–3 p.m.

Grand Valley State University
Russel H. Kirkhof Center
Allendale Campus



These materials were developed under a grant awarded by the Michigan State Board of Education.

From Muskegon: I-96 East to Coopersville (Exit 16). Turn right on 68th Avenue and go approximately 6 miles. Turn left (east) on M-45 (Lake Michigan Drive). Go approximately 3 miles to Grand Valley's entrance and turn right (south). Approximately 4.5 miles from Muskegon.

From Kalamazoo: US-131 North to I-196 West (Gerald R. Ford Freeway). Exit Lake Michigan Drive/M-45 (Exit 75). Take M-45 approximately 1.2 miles to Grand Valley's entrance and turn left (south). Approximately 6.5 miles from Kalamazoo.

From Holland: US-31 North to M-45 (Lake Michigan Drive). Turn right (east) on M-45 and go approximately 1.2 miles to Grand Valley's entrance and turn right (south). Approximately 2.5 miles from Holland.

From Detroit/Lansing: I-96 West to I-196 West (Gerald R. Ford Freeway) through downtown Grand Rapids. Exit Lake Michigan Drive/M-45 (Exit 75). Take M-45 approximately 1.2 miles to Grand Valley's entrance and turn left (south). Approximately 1.6 miles from Detroit and 7.5 miles from Lansing.

SESSION A: 8:30–9:30 a.m.

A1 KEYNOTE for Administrators (Three Hour Session)**PL@N A1: Supporting a Framework Aligned Vision of Instruction - Part 1***James Emmerling, Genesee Intermediate School District*

Use your evaluation tool to analyze examples of teaching to recognize and support a vision of instruction that is consistent with *A Framework for Science Education* and the Next Generation Science Standards. Participants should also register for sessions B2 and C2. Grades K - 12

A2 How to Build an Elementary STEM Program*Alex Harsay & Andrew Ratke, Grand Haven Public Schools*

Grand Haven Area Public Schools is in the first year of an elementary STEM program. We will discuss how we started to create our STEM program. Grades K - 5, Administration

A3 MEECS Online Courses*Tom Occhipinti, Michigan Department of Environmental Quality*

Michigan Environmental Education Curriculum Support (MEECS) Educator Workshops will now be available online to supplement MEECS in-person workshops. There will be a simple demonstration. Grades 3 - 8

A4 Teaching STEM On a Budget*Laura Cross, The Air Zoo*

Discover quick, low-cost ways to mix STEM activities into your science curriculum. Real-world applications, hands-on fun, and a large variety of STEM resources will be provided. Grades 3 - 12

A5 Practicing Citizen Science: An Investigation of Schoolyard Resource Availability and Population Dynamics*Joe Jacquot, GVSU Biology Department**Erin Koren & Jamie Meaney, GVSU Pre-service Teacher*

This is a lesson idea that will be published in the Fall 2016 Michigan Science Teachers Association Journal on the use of the app MI-MAST as a platform for a field-based scientific investigation. Grades 6 - 8

A6 Engaging Students with Real-World STEM!*Ebiri Nkugba & Rick Mushing, Kent Intermediate School District*

Learn about tools that engage your students, including a YouTube library of local Grand Rapids business problems for kids to solve. Additional hands-on tools include VEX robotics, Little Bits, Arduino, NAO robots, 3D printing, and drones! Grades 6 - 8

A7 Implementing a STEAM-Based Environmental Science Program*Robert Barrett, West Michigan Academy of Environmental Science*

Come hear how we are using tech and environmental science to engage at-risk teens in the process of science. Please come share and exchange ideas! Grades 6 - 16, Administration

SESSION B: 9:45–10:45 a.m.

B1 Immerse Your Students in MSS Practices with NexGen Inquiry*Bill Dinkelmann & Jim Nicolette, Van Andel Education Institute*

Explore NexGen Inquiry's web-based platform, built to support MSS implementation and STEM using a research-based instructional model. Get started today with online professional development, interactive student journals and instructional resources. Grades K - 12, Administration

B2 PL@N A1: Supporting a Framework Aligned Vision of Instruction - Part 2*James Emmerling, Director, Genesee Intermediate School District*

Part 2 of a 3 part session. Participants should register for A1 and C2. Grades K - 12

B3 Be a Hit! Use the RMSC Science Kits!*Natalie Armstrong & Kelly Heid, GVSU Geology Department*

Looking for new activities in your classroom that match the NGSS? Considering hosting a Science Night event at your school? Join us to preview some of the new and improved STEM Kits available for loan from the RMSC. Grades 3 - 5

B4 Climate at a Glance: From Local to National Scale*Janet Vail, GVSU Annis Water Resources Institute*

View an online activity that introduces students to climate through analysis of nationwide monthly temperature and precipitation data. EPA's new climate fact sheets for states will be highlighted as well. Grades 6 - 12

B5 Engineering Standards Through a College Transition Curriculum*Denise Klaasen, West Michigan Aviation Academy**Charles Standridge, GVSU School of Engineering*

This session describes how a local school has implemented STEM and engineering courses into their curriculum with the help of GVSU's engineering department. Topics will include content, research projects, teaching pedagogy and strategies, and classroom activities. Grades 9 - 12

B6 Michigan Natural Resources Production: Resources for Teachers*Peter Voice, Western Michigan University*

This presentation will provide an overview of natural resources produced in Michigan. The geologic context, production statistics and economics of iron, copper, oil, crushed stone, etc. will be discussed. Grades 9 - 12

SESSION C: 11 a.m.–12 noon

C1 KEYNOTE for Elementary Teachers (K-8)**Helping Students Bloom into Innovators by Focusing on the Root of STEM: Literacy***Tracy Horodyski, Kenowa Hills Public Schools*

Focusing our lens on literacy will help us intentionally nurture critical and creative thinking and allow students to bloom into the curious, innovative, lifelong learners we believe they can be! Grades K - 8

C2 PL@N A1: Supporting a Framework Aligned Vision of Instruction - Part 3*James Emmerling, Director, Genesee Intermediate School District*

Part 3 of a 3 part session. Participants should register for A1 and B2. Grades K - 12

C3 Universal Talk Moves to Engage Students in Science*Megan Schrauben & Jill Griffin, Michigan Department of Education*

Talk Moves help make student learning and reasoning public. Discover how teachers can release control through facilitated discussions of science content. Grades K - 16, Administration

C4 The Engineering Process in a Week - A Problem Based Learning Approach*Ryan Noble, Partner | Team Lead - Mechanical Engineering*

This session will present a case study of a week-long engineering curriculum which was recently delivered to a middle school class at a Leadership Academy in Central Europe. Grades 6 - 8

C5 4-H Science: Robotics and Animal Science STEM Resources*Janis Brinn & Melissa Elischer, Michigan State University Extension*

4-H Science: Asking Questions and Discovering Answers. Participants will be introduced to and sample two different hands-on 4-H STEM resources: *Junk Drawer Robotics and Animal Science, Anywhere.* Grades 6 - 8

SESSION C: 11 a.m.–12 noon (continued)

C6 Integrating STEM for Middle School Enrichment*Susan Ipri Brown, Hope College**Anna Dowd, Hope College Student*

Learn how engineering activities were integrated into summer and academic year enrichment sessions for underserved middle school students. Design projects complemented math, science, and literacy work in their classrooms. Grades 6 - 8, Administration

C7 Developing Three Dimensional Assessments*Deborah Herrington, GVSU Chemistry Department**Justin Carmel, Michigan State University*

We want students to engage in 3D learning, so we must use 3D assessments. Participants will learn to use the 3D Learning Assessment Protocol (3D-LAP) to develop 3D assessment questions. Grades 9 - 12

SESSION LUNCH: 12 noon–12:45 p.m.

Enjoy conversation with your colleagues over lunch served in the Grand River Room, 2250 Kirkhof Center.

SESSION D: 12:45–1:45 p.m.

D1 KEYNOTE for Secondary Teachers (7-12)**Don't Teach My Daughter Science; Teach Her to be a Scientist***Kevin Sylvester, Grand Haven Public Schools*

Follow along as one teacher chronicles his journey from a teacher-centered instruction model to a student-centered, inquiry instruction model. Integration of STEM practices and how best to implement them will be discussed. Grades 6 - 12

D2 Modeling Magnetism to Support Framework Aligned Instruction*James Emmerling, Genesee Intermediate School District*

Experience an exemplar lesson involving academically productive talk to engage you in the science practices of developing and using models, engaging in argument from evidence, and constructing explanations to make sense of a phenomenon. Grades K-12, Administration

D3 Leveraging The New Science Standards to Engage Students in Math and ELA Class*Megan Schrauben, Tamara Smolek & Jill Griffin, Michigan Department of Education*

With the adoption of Michigan's new science standards we have opportunities to leverage math, ELA, and the assessment writing process to make class more engaging and equitable for students. Grades K - 12, Administration

D4 FIRST Robotics - Using robots to engage students in STEM*Terry L. Stevens, GVSU School of Engineering*

Inspire youth to become science and technology leaders and innovators by engaging them in exciting, experiential, mentor and project-based programs that teach STEM skills, inspire innovation, and foster well-rounded life capabilities. Grades 2 - 16, Administration

D5 Aeronautical Engineering During and After School: Civil Air Patrol Curriculum in Action*Kelly Cichy, Siena Heights University**Denee Hartung, Adrian Public Schools*

As modeled in Lenawee County, the Civil Air Patrol curriculum provides opportunities for middle school students to explore STEM through aeronautical engineering during and after school and in summer camps. Grades 6 - 8

D6 Rates of Earth Processes: Comet Speed to Crawling Plates*Steve Mattox, GVSU Geology Department**Emily Siriano, GVSU Pre-service Teacher*

Earth materials and systems interact over fractions of seconds to billions of years. We will provide numerous classroom-ready examples to be used across your school year. This addresses the NGSS cross-cutting concept of scale, proportion, and quantity. Grades 6 - 16

SESSION E: 2–3 p.m.

E1 EdCamp: Helping Students Bloom into Innovators by Focusing on the Root of STEM: Literacy*Tracy Horodyski, Kenowa Hills Public Schools*

Using the Conversation Cafe protocol (which can be easily implemented in the classroom with any subject), we will explore your noticings and wonderings from the keynote presentation by digging deeper through discourse. Grades K - 6

E2 Science Summative Assessment and Standards Implementation Update*Tamara Smolek & Megan Schrauben, Michigan Department of Education*

MDE will be present to answer your questions about the new science summative assessment and the supports that we have developed through the science standards implementation process. Grades K - 12, Administration

E3 Spork and Beans: Addressing Evolutionary Misconceptions*Christopher Dobson, GVSU Biology Department*

This inquiry-based predator/prey simulation models natural selection and is aligned with the NGSS. Detailed 5E lesson plan provided. Grades 5 - 12

E4 STEM Adventures- Engineering? Me? You've got to be kidding!*Kathleen Jenkins, Beaverton Rural Schools / CMU Research Experience for Teachers**Holly Ylitalo, Ashley Community Schools*

Want to apply STEM practices to the classroom? Join us as we discuss our adventures in engineering research as we readied ourselves to implement STEM in the Science/Math/Technology classroom. Grades 6 - 16

E5 Kings and Queens and the Process of Science*Rob Keys, Cornerstone University*

Helping students grasp how science works can be hard. Using a deck of cards can help them test hypotheses, evaluate, and critically think about patterns and models using inquiry. Handouts will be provided. Grades 6 - 16

E6 Applied Engineering Problem Solving*Nicholas Baine, GVSU School of Engineering*

This session shows how advanced math topics are used in college engineering courses. Examples will be given of how they can be taught at a high school level to motivate students and provide a context for learning. Grades 9 - 12

E7 Real-world Experience for High School Students in Required Courses*Renee Fay, Coopersville High School*

All Geometry students at Coopersville HS were involved in a fire truck redesign project with a local fire department in the spring of 2016. PBL tips will be shared. Grades 9 - 12