BEAVERTON SCHOOL DISTRICT
THRIVE • CONTRIBUTE • EXCEL

**BOARD MEETING DATE**
**March 18, 2013**

## Standards-Based Learning Update

Carl Mead, Robin Kobrowski and Jan Martin will provide an update on the Standards-Based Learning.

# Standards-Based Learning System Update
# Monday, March 18th

Below is a brief description of the professional development and subject area articulation work for the 2012-13 academic year.

**1. Professional Development:**
In collaboration with elementary, middle and high school principals and Teaching and Learning staff, Professional Development Facilitators were chosen to help plan and implement professional development supporting the Standards-Based Learning System.
The Professional Development Facilitators meet monthly to plan professional development based on common outcomes that is then delivered to their building staff.

Professional Development to include:

- Learning Target and Rubric Development (in alignment with the Common Core State Standards, Next Generation Science Standards, and Oregon State Standards)
- Quality Assessment Practices (including calibration & moderation)
- Instructional Strategies
- Effective and Actionable Feedback Practices

At the elementary level the professional development has focused on writing district-wide. In February, Professional Development Facilitators prepared all elementary teachers in their schools for a moderation of student writing collections that provided an opportunity to work collaboratively across all schools. Professional Development Facilitators will follow the same format as they lead a district calibration on April 12, 2013.

The professional development at the secondary level has included lesson and unit planning using long-term learning targets, formative and summative assessment practices, engagement practices, effective and actionable feedback, and calibration and/or moderation.

The professional development has been delivered through a combination of staff meetings, department meetings, and meetings on staff development days.

**2. Articulation Work:**
<u>Elementary</u>

- Teams of elementary teachers, including ESL and SPED, formed articulation teams for Language Arts, Mathematics, Science and Social Studies during the summer of 2012 and have continued their work over the course of the school year. The teams have developed long-term and supporting targets based on the Common Core, State, and Next Generation Science Standards. They also created rubrics and identified resources that align with each of the long-term targets. As the teams move forward in their articulation work, there will be opportunities for professional development to support the creation of interdisciplinary units.

<u>Secondary</u>

- Language Arts, Mathematics, Science and Social Studies are reconvening the articulation teams to evaluate and edit long-term and supporting learning targets and rubrics using feedback directly from teachers and through survey data.

- Middle school teachers in Visual Arts, Band, Choir, Drama, Technology, PE, Health, World Language and ALC are currently working on converting standards to the long-term and supporting learning target form and drafting rubrics.
- High school teachers in content areas other than Mathematics, Language Arts, Science, and Social Studies are beginning the process of converting standards to the long-term and supporting learning target form and drafting rubrics.

**3. Summer Courses:**

- Summer offerings for elementary teachers will include STEM sponsored classes in science and math.
- Courses for secondary teachers of language arts, mathematics, and science will be offered this summer. The courses will focus on shifts in instructional and assessment practices required to ensure students are meeting the Common Core State Standards and prepared for the new Smarter Balance Assessment.

**Attached Documents:**

- Promotional Flyer for math and science courses
- Shifts document for language arts
- Shifts document for math.

Link to ODE sample of PTA guides: http://www.ode.state.or.us/search/page/?id=3398

# Mathematics Professional Development Courses
# BSD 6-12 Teachers

## Preparing for Common Core Instruction

Through a partnership between the Beaverton School District, the Portland Metro STEM Center, and Portland State University, all 6-12 teachers of mathematics will participate in one of the following mathematics content and pedagogical practices courses offered this spring and summer. Teachers will receive compensation for taking one of the courses through Title II grant funds. Both courses are designed to:

- Deepen teacher pedagogical content knowledge addressing learning progressions and student prior knowledge and misconceptions.
- Increase teacher understanding of how students learn various content and processes/practices.
- Align Common Core State Standards (CCSS) of Mathematics with instructional units and materials.
- Implement standards-based and assessment-for-learning practices.
- Increase teacher self-efficacy and comfort in bringing about the desired outcomes in student engagement, motivation and learning in response to the CCSS shifts.
- Courses are four full days or eight half-days, with school year follow-ups, and can be taken for credit at the PSU graduate tuition rate. Tuition invoicing (PSU invoices BSD for course credit payment) is available for both courses if taken for credit.

## The Power of Mathematical Practice

**Spring Session: TBD Based on Teacher Needs**
**Summer Course:**
**Session 1: June 24th-28th Monday- Thursday 9:00-3:00**
**Instructor: Dennis Williams**
**Session 2: August 5-15 Time: 1:00-3:30 pm Instructors: Susan Winner and Paul Latiolais**
**Location: Capital Center**
**Option of 2 PSU Graduate Credits for Part 1 of Course.**
**Note: 2013-14 School Year Follow-Up Sessions for 2 additional compensation and 2 PSU graduate credits.**

In this course secondary mathematics educators will use the Common Core's Standards for Mathematical Practice to improve student learning and practices in mathematics. Educators will un-wrap the powerful connection between the Mathematical Practices and the Standards for Mathematical Content. Each educator will develop a unit to be implemented in the 2012-13 school year. These units will be created in collaboration with other educators and shared. Each unit will include formative and summative assessments that incorporate the Mathematical Practices and the Mathematical Content, including rubrics that will help teachers and their students determine what it means to be proficient in a given standard.

## Using Physics to Bring Algebra I & CCSS Alive

**Spring Session: TBD Based on Teacher Needs**
**Tentative: Session 1: June 18-21 and**
**Session 2 August 19-23 Monday-Thursday (2 Credits)**
**Time: 9:00am-3:00 pm Location: Capital Center**
**Instructor: Dennis Williams**
**Option of 2 PSU Graduate Credits for Part 1 of Course.**
**Note: 2013-14 School Year Follow-Up Sessions for 2 additional compensation and 2 PSU graduate credits.**
There is a powerful connection between the long-term learning targets in Algebra 1 and a Patterns Physics class, especially through an integration of the Common Core State Standards Mathematical Practices. This course will explore how Algebra 1 teachers can use the data generated from a Conceptual Physics course to provide context and application to the functions explored in Algebra. Physics teachers will learn how the use of precise mathematical language, mathematical concepts and practices will enhance their instruction and bring a deeper understanding of the Physics concepts. Participants will collaboratively create units that integrate all the mathematical practices in a way that will make the Algebra come alive through connections to various context and application. Each unit will include formative assessment practices and summative assessments that incorporate the Mathematical Practices, Mathematics Content and connections to Physics.

To Register Please Go To: TeacherSource

# Language Arts Professional Development Courses
# BSD 6-12 Teachers

**Common Core Instructional Practices in Language Arts**
In this two-day ELA (English Language Arts) course, participants will explore the instructional "shifts" of the Common Core, including balancing informational/literary text, text complexity, close reading, text-based answers, academic vocabulary, and writing from sources. Teachers will explore how the Common Core State Standards have been "unpacked" into Beaverton School District's long-term and supporting learning target structure and discuss the impact of the standards on instruction and assessment. In partnership with one another, teachers will design a bank of assessments and resource materials for each long-term learning target to be posted on TeacherSource.

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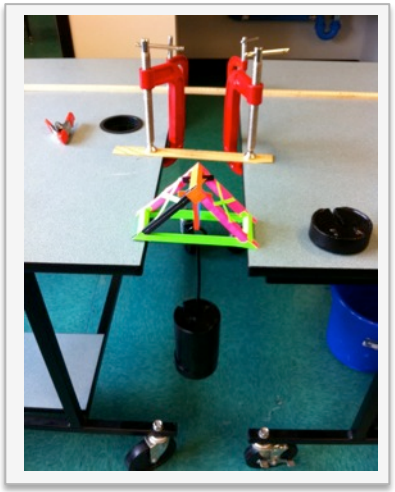
## Session Date, Time & Place TBD

YOU ARE INVITED TO:

# SUMMER 2013

PORTLAND METRO STEM PARTNERSHIP



# STEM Professional Development

Science, Technology, Engineering and Math

Photo by The Private Eye® Project

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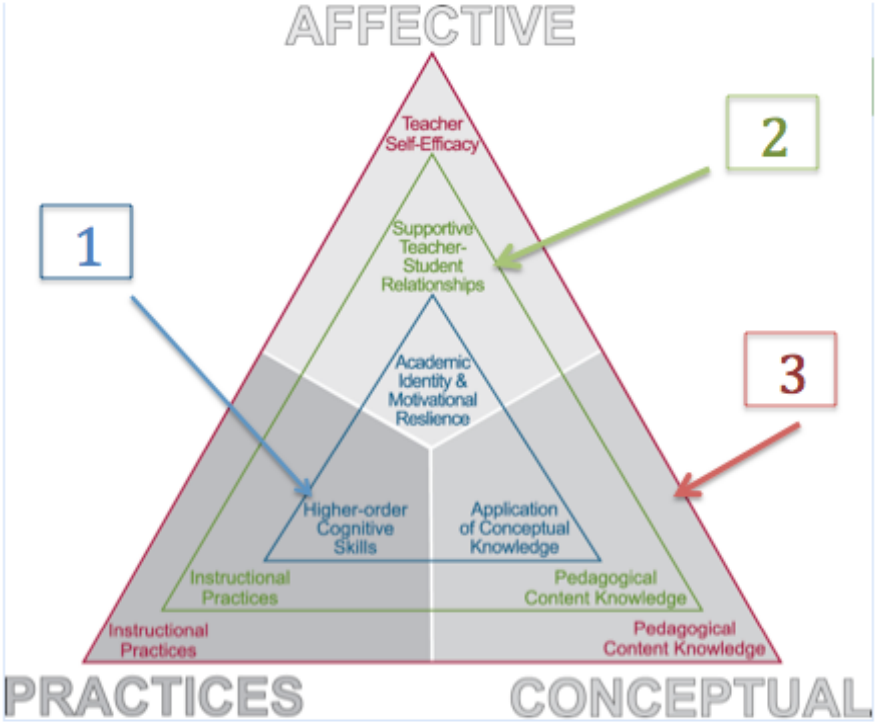
To Pre-Register And Save A Spot For Any Course(s) Complete the Form at: https://portlandstate.qualtrics.com//SE/?SID=SV_cZbd2IyX1RiGNGR

# PORTLAND METRO STEM PARTNERSHIP TEACHERS ACADEMY COURSEWORK OUTCOMES




1. If we want students to be successful in STEM majors and careers, then students need to acquire the conceptual knowledge, higher order cognitive skills, and dispositions that are key outcomes associated with college and career readiness in STEM.

2. If we want students to be college and career ready in STEM, then classroom environments must be characterized by the instructional practices, pedagogical content knowledge (specialized knowledge of teaching specific content), and supportive teacher-student relationships.

3. The Portland Metro STEM Partnership's Teacher Academy wants to support teachers in creating effective classroom environments by providing high quality STEM learning opportunities that focus on the implementation of effective instructional practices, pedagogical content knowledge and teacher self-efficacy.





# CONNECT2MATH-CONNECT2SCIENCE GRANT K-6 SCIENCE COURSES

## SCI 810 CONNECT2SCIENCE: LIFE SCIENCE

**June 24th- June 28th Monday- Friday w/3 Follow-Up Sessions 2013-14**
**Time: 9:00am- 4:00pm**
**Location: Tryon Creek**
**Instructors: Chris McMurray and Stephanie Wagner**
**This course is being offered free of charge as part of a Math and Science Partnership Grant. Course credit will be available at the regular PSU tuition rate as an SCI810 class (3 PSU graduate credits).**

This course is designed to deepen science content knowledge of Life Science using the forest as a laboratory. Material will be introduced using an inquiry model to reinforce knowledge of plant and animal characteristics, behaviors, and interdependence, as well as interactions of organisms and the environment where they live. Teachers will understand the learning progressions of Life Science and purposely select and adapt instructional materials, embedding science inquiry and engineering design, based on the 2009 Oregon Science Content Standards and Next Generation Science Standards.

## SCI 810 CONNECT2SCIENCE: PHYSICAL SCIENCE

**June 24th- June 28th Monday- Friday w/3 Follow-Up Sessions 2013-14**
**Time: 9:00am- 4:00pm**
**Location: East Sylvan Middle School**
**Instructors: Chris Steiner and Marilyn Mackiewicz**
**This course is being offered free of charge as part of a Math and Science Partnership Grant. Course credit will be available at the regular PSU tuition rate as an SCI810 class (3 PSU graduate credits).**

This course focuses on the science content of the Physical Science concepts of the Oregon Science Standards: Forces and Motion, and Matter (Solids, Liquids, Gases, Atoms and Chemical Change). Participants experience the science content embedded in inquiry and engineering design activities to understand the knowledge and skills of physical science. Participants will model concrete representations of abstract or "invisible" concepts; age-appropriate applications will be developed.

To Pre-Register And Save A Spot For Any Course(s) Complete the Form at: https://portlandstate.qualtrics.com//SE/?SID=SV_cZbd2IyX1RiGNGR

## CONNECT2MATH-CONNECT2SCIENCE GRANT MATH K-6 COURSES

### SCI 810 CONNECT2MATH: NUMBERS & OPERATIONS

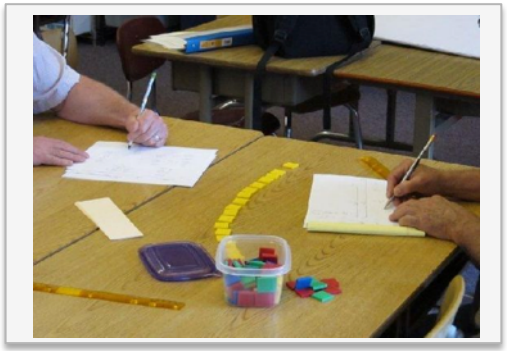
**June 24th- June 28th Monday- Friday w/3 Follow-Up Sessions 2013-14**
**Time: 9:00am- 4:00pm**
**Location: East Sylvan Middle School**
**Instructors: Carol Biskupic Knight and Phyllis Leonard**
**This course is being offered free of charge as part of a Math and Science Partnership Grant. Course credit will be available at the regular PSU tuition rate as an SCI810 class (3 PSU graduate credits).**

This course focuses on how students learn the basic operations (addition, subtraction, multiplication and division) and develop and make sense of computational algorithms as they extend from whole numbers to decimals. Also examined are the important foundations of place value, properties of operations, and number systems. Participants will learn to distinguish between misconceptions and error patterns in student thinking and will learn to orchestrate productive mathematical discussions through carefully planned lessons. They will create lessons that integrate technology and other tools to support students' learning of the Common Core Standards and Mathematical Practices.

### SCI 810 CONNECT2MATH: FRACTIONS

**June 24th- June 28th Monday- Friday w/3 Follow-Up Sessions 2013-14**
**Time: 9:00am- 4:00pm**
**Location: East Sylvan Middle School**
**Instructors: Nicole Rigelman and Erika Hansen**
**This course is being offered free of charge as part of a Math and Science Partnership Grant. Course credit will be available at the regular PSU tuition rate as an SCI810 class (3 PSU graduate credits).**

This course focuses on building on students' informal understanding of sharing and proportionality to develop concepts and helping students understand *why* fraction computations make sense. Participants will examine different meanings of fractions (i.e., part-to-whole, ratio, division), visual representations including number lines, set models, and area models, and a variety of problem solving approaches that support deep understanding of fractions, decimals and percents. They will create lessons that integrate student discourse and mathematical tools that support student engagement with the Common Core Standards and Mathematical Practices.



## OTHER ELEMENTARY MATH COURSES: DEEPENING MATHEMATICAL IDEAS (K-8)

### CI 510 PATTERNS FUNCTIONS AND CHANGE

**August 12th-16th Monday- Friday**
**Time: 8:30 am-4:00 pm Location: TBD**
**Instructors: Nicole Rigelman**
**Summer Session Cost: 3 PSU graduate credits**
Discover how the study of repeating patterns and number sequences can lead to ideas of functions, learn how to read tables and graphs to interpret phenomena of change, and use algebraic notation to write function rules. With a particular emphasis on linear functions, explore quadratic and exponential functions and examine how various features of a function are seen in graphs, tables, or rules. Student thinking is at the center of this course through examination of student work and students at work (written and video cases).

### CI 510 MAKING MEANING WITH OPERATIONS

**August 19th-23rd Monday- Friday w/3 Follow-Up Sessions 2013-14**
**Time: 8:30 am-4:00pm Location: TBD**
**Instructor: Roxanne Malter**
**Summer Session Cost: 3 PSU graduate credits**
Examine the actions and situations modeled by the four basic operations. The course begins with a view of young children's counting strategies as they encounter word problems, moves to an examination of the four basic operations on whole numbers, and revisits the operations in the context of rational numbers. Student thinking is at the center of this course through examination of student work and students at work (written and video cases).

To Pre-Register And Save A Spot For Any Course(s) Complete the Form at: https://portlandstate.qualtrics.com//SE/?SID=SV_cZbd2IyX1RiGNGR

## SCI 510 BRINGING STEM TO K-2 LITERACY

**August 5th-9th Monday- Friday (3 credits) w/3 Follow-Up Sessions 2013-14 (1 credit)**
**Time: 9:00am-4:00pm Location: Intel STEM Center**
**Instructors: Erika Hansen**
**Summer Session Cost: 3 PSU graduate credits**
**Note: 2013-14 School Year Follow-Up Sessions for 1 additional PSU Grad credit**

The K-2 STEM Literacy course is designed to offer classroom teachers practical, hands-on opportunities to deepen their content knowledge and examine research-based pedagogical strategies at the elementary level. Classroom teachers will work collaboratively to develop a standards-based integrated unit, connecting science and literacy instruction/learning within a primary classroom setting. Emphasis will be placed on creating inquiry and/or engineering units that engage students in scientific discourse, incorporate the skills of scientific inquiry, enhance problem solving, and encourage all students to participate in learning through the integration of science and literacy. Sheltered instruction and assessment FOR learning will also be applied within this course. This course is continued into the school year for 1 additional PSU graduate credit.

## SCI 510 CONNECTING MATH AND SCIENCE THROUGH INTEGRATION (K-6)

**August 5-9th Monday- Friday (3 credits) w/ Follow-Up Sessions 2013-14 (1 credit)**
**Time: 9:00am-4:00 pm Location: Intel STEM Center**
**Instructors: Nancy Lapotin and Marsha Wolfe**
**Summer Session Cost: 3 PSU graduate credits**

Based on a course designed for the Connect2Math-Connect2Science grant teachers, this class is now open to all K-6 teachers to identify the connections between the math and science standards to create an integrated unit. Participants will develop an understanding of the learning progressions and the deep connections in math and science. Teachers will use research-based strategies as they integrate the following areas into their instructional unit: The Common Core Math and Next Generation Science content standards and practices, effective instructional strategies, and assessment. Participants will learn how the practices of inquiry, mathematical problem solving, reasoning, and engineering design support content standards and can be "braided" together to form a cohesive integrated unit that leverages and supports an increase in students achieving both math and science content standards and practices.



ELEMENTARY STEM INTEGRATED COURSES

## SCI 510 INTEGRATING STEM CROSSCUTTING IDEAS THROUGH THE PRIVATE EYE® PROGRAM

**August 12th-16th Monday-Friday (3 credits) w/ 3 Follow-Up Sessions 2013-14 (1 credit)**
**Time: 9:00-4:00 Location: Intel STEM Center**
**Instructors: Kerry Ruef, David Melody and Carol Biskupic Knight**
**Summer Session Cost: 3 PSU Graduate Credits through Continuing Education (See Note Below)**
Dandelions! Crickets! Eyeballs! In a unique collaboration between the STEM Center, PSU, and the acclaimed Private Eye Program, elementary teachers will explore how to use this hands-on, interdisciplinary program to rev up student motivation, enrich content understanding, and heighten critical and creative thinking. Teachers will apply crosscutting ideas of analogies, patterns, scale and proportion, systems and models, and structure and function throughout science, math, and literacy. The focus will be on embedding the use of a jeweler's loupe and questioning strategies into STEM content areas and scientific and mathematical practices to enhance students' ability to: 1) develop motivational bridges between content areas; 2) make investigation into content areas simpler, but sophisticated and scholarly; 3) develop students who naturally write-across-the curriculum with high-level results. Additionally, teachers will develop lesson plans that incorporate *The Private Eye®* process and activities to address specific learning targets for elementary students in STEM areas, per the Next Generation Science Standards and Common Core for Math and for English Language Arts & Literacy. As part of a grant, participants receive a set of Private Eye loupes.
**Course Fee: $725 to The Private Eye® Program**
**PSU Credit Fee: $165 to PSU for 3 Continuing Education Graduate Credits**
**For questions on payment and district reimbursement:**
**Contact Carol Biskupic Knight at bis2@pdx.edu**

Pictures By The Private Eye® Project

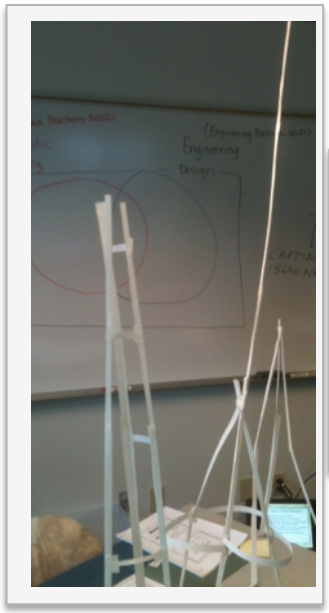
To Pre-Register And Save A Spot For Any Course(s) Complete the Form at: https://portlandstate.qualtrics.com//SE/?SID=SV_cZbd2IyX1RiGNGR

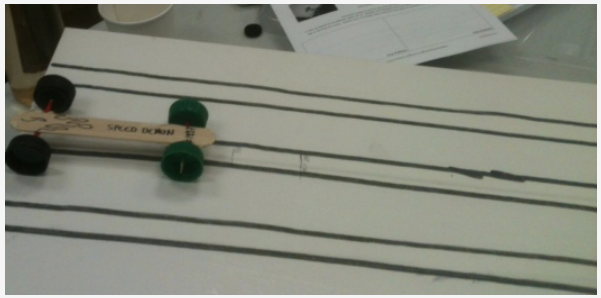
## K-8 STEM COURSES: ENGINEERING DESIGN

### SCI 510 ADVANCING STEM INSTRUCTION THROUGH ENGINEERING DESIGN

**Session 1: June 17-21 Session 2: August 12-16 Monday-Friday w/ Follow-Up Sessions 2013-2014**
**Time: 9:00am- 4;00**
**Location: Intel STEM Center**
**Instructors: Cary Sneider, Professor, PSU, Erika Hansen, and Derek Runberg**
**Summer Session Cost: 3 PSU graduate credits Note: 2013-14 School Year follow-up sessions for an additional one credit.**

Teachers in K-8 classrooms will learn about the engineering practices, disciplinary ideas and crosscutting concepts aligned to the Next Generation Science Standards (NGSS). This course is co-instructed by Cary Sneider, leader of the writing team for the engineering standards for NGSS. Teachers will learn the vertical progression of the standards and practices along with detailed grade level specific engineering design embedded lessons. Learning how to instruct and assess student progress towards the engineering components of the standards will be a key part of the course. Teachers will learn strategies to help their students see themselves as engineers and learn about many different types of careers in engineering.









## K-12 STEM COURSES

### SCI 510 ASSESSMENT FOR LEARNING IN SCIENCE AND ENGINEERING

**August 12th-16th Monday- Thursday (3 credits) w/ Follow-Up Sessions 2013-14 (2 credits)**
**Time: 9:00am-4:00 pm Location: Intel STEM Center**
**Instructors: Emily Saxton and Susan Holveck**
**Summer Session Cost: 3 PSU graduate credits**

Create a complete feedback cycle of using assessment ***for*** learning by focusing on the 3 student outcome spaces (affective, conceptual, and practices) that are essential for student success in science and engineering. Teachers will collaborate to create assessments of higher-order thinking skills, application of content knowledge, and academic identity, engagement and persistence. Teachers will also learn how to incorporate diverse assessments as part of their instruction including pre, formative, and summative assessments of all learning goals. Together these comprehensive assessment system will be designed to measure the three important student outcome areas that are key for teachers to make data informed decisions ***for*** learning. This course is especially relevant to teachers within schools that are that are beginning their 4-year STEM transformational change project in collaboration with the Portland Metro STEM Partnership.

### MOVING SCIENCE INTO THE NEXT GENERATION

**Dates: Summer Online and Technology Enhanced (TBD) and In-Person (June Date TBD) for 3 credits. Location: Tentative In-Person Session: Intel STEM Center) w/ Follow-up sessions 2013-14 (1 credit).**
**Instructors: Carol Biskupic Knight and Tricia Halonen**
**Summer Session Cost: 3 PSU graduate credits**
This hybrid course will incorporate face-to-face sessions with participants, along with technology-enhanced collaborative platforms to support a teacher study group pathway aligned to student performance expectations in the Next Generation Science Standards (NGSS) and the correlating shifts in teacher instructional practices necessary to meet these new standards. Using a variety of digital, print, and collaborative learning formats (including video exemplars, student work samples and perspectives of scientists and engineers) participants will increase their skills in incorporating the NGSS Practices, Crosscutting Concepts, and Core Disciplinary Ideas into their instruction. This course includes follow-up and technology-enhanced collaborative learning teams throughout the 2013-14 school year.

To Pre-Register And Save A Spot For Any Course(s) Complete the Form at: https://portlandstate.qualtrics.com//SE/?SID=SV_cZbd2IyX1RiGNGR

## CI 510 THEORY TO PRACTICE IN SCHOOL GARDENS

**June 24th -July 3rd Monday-Thursday w/3 Follow-Up Sessions 2013-2014**
**Time: 9:00am- 12:30pm (Student Programming 9:30am-11: 30am)**
**Location: Sun School Sites (Lane, Kelley, Lent, & Woodmere)**
**Instructors: Nancy Lapotin and Sybil Kelley, Assistant Professor PSU**
**Summer Session Cost: 3 PSU graduate credits**
**Note: 2013-14 School Year follow-up sessions for an additional one credit.**
Educators from various contexts and in various stages of professional development (in-service teachers, pre-service teachers, extended-day/SUN school teachers, informal science educators, etc.) will join forces to put research-based science education into practice. Each day, educators will work with K-8 students at one of four partnering SUN schools in outer SE Portland (Lane, Kelley, Lent, or Woodmere). Collaboratively designed STEM programming will focus on the implementation of standards-based curriculum, the effective use of formative assessments and the use of hands-on, inquiry-based activities with elementary students. In addition, the student program will further connect the school day and extended day programming at each site by utilizing school gardens as a context for teaching and learning. This course can be taken by itself or in conjunction with "Connect to Science Through Learning Gardens".

## CI 510 CONNECT TO SCIENCE THROUGH LEARNING GARDENS

**June 24-July 3 Monday- Thursday w/3 Follow-Up Sessions 2013-2014**
**Time: 1:00pm- 5:00pm Location: Learning Gardens Laboratory**
**Instructors: Nancy Lapotin, and Sybil Kelley, Assistant Professor, PSU**
**Summer Session: 3 PSU graduate credits**
**Note: 2013-14 School Year follow-up sessions for an additional one credit.**

Educators from various contexts and in various stages of professional development (in-service teachers, pre-service teachers, extended-day/SUN school teachers, informal science educators, etc.) are encouraged to take advantage of this opportunity to learn theory and best-practices of science and sustainability education, then put this understanding into practice by designing curriculum that utilizes learning gardens (at schools and/or community sites) as a context for STEM learning and teaching. The course will specifically focus on developing standards and inquiry-based curriculum that integrates content, formative assessments, and experiential learning activities that effectively integrate content through the context of school gardens. This course can be taken by itself or in conjunction with "Theory to Practice in School Gardens."





## SCI 510 PLACE BASED EDUCATION FOR SUSTAINABILITY

**August 12th-15th Monday-Thursday: 9:00-4:00**
**Location: Metro Area Field Study Locations**
**Instructors: Patrick Willis and Sheilagh Diez**
**Summer Session Cost: 2 PSU graduate credits**

This course supports teachers to identify the connections between place-based education, STEM, and sustainability to engage students in authentic learning in their community. A variety of outdoor settings within the Portland-Metro area provide the study of nature from aesthetic, historic, and scientific perspectives. Content standards and practices and Next Generation Science Standards will be the backdrop to create integrated instruction across disciplines for elementary to high school levels. Participants will develop an understanding of the content learning progressions and the rich experiences that can be created by using place-based practices as a pathway for student engagement and achievement. Teachers will utilize a wide variety of community-based resources and develop instructional materials addressing STEM and sustainability to incorporate meaningful experiences into academic learning.



To Pre-Register And Save A Spot For Any Course(s) Complete the Form at: https://portlandstate.qualtrics.com//SE/?SID=SV_cZbd2IyX1RiGNGR

## MTH 510 THE POWER OF MATHEMATICAL PRACTICES

**Summer Course: 2 credits w/ Follow-Up Sessions 2013-14 (2 credits)**
**Session 1: June 24th-28th Monday- Thursday 9:00-3:00**
**Instructor: Dennis Williams**
**Session 2: August 5-15 Time: 1:00-3:30 pm Instructors: Susan Winner and Paul Latiolais**
**Location: Intel STEM Center**
**Summer Session Cost: 2 PSU graduate credits**
**Note: 2013-14 School Year Follow-Up Sessions for 2 additional PSU graduate credit**

In this course secondary mathematics educators will use the Common Core's Standards for Mathematical Practice to improve student learning and practices in mathematics. Educators will un-wrap the powerful connection between the Mathematical Practices and the Standards for Mathematical Content. Each educator will develop a unit to be implemented in the 2012-13 school year. These units will be created in collaboration with other educators and shared. Each unit will include formative and summative assessments that incorporate the Mathematical Practices and the Mathematical Content, including rubrics that will help teachers and their students determine what it means to be proficient in a given standard.

## MTH 510-INTEGRATING MATH AND TECHNOLOGY

**June 19-July 2 Daily Time: 9:00am-12:00 pm**
**Location: Intel STEM Center**
**Instructors: Milan Sherman**
**Summer Session Cost: 3 PSU graduate credits**

The goal of the course is to assist mathematics teachers in developing mathematical *technological pedagogical content knowledge* (TPACK). Participants will understand how technology can be used to deepen students' knowledge of mathematics, and develop pedagogical strategies for doing bringing about student understanding. Teachers will engage in a number of mathematical investigations in this course that are aimed at deepening students' mathematical knowledge using technology in some way, and providing opportunities to make connections to practice. Teachers will identify how to incorporate technologies as tools for learning and teaching mathematics in ways that accurately translate mathematical concepts and processes into forms understandable by students and to enhance learning and student identity as a math learner.



SECONDARY 6-12 MATH COURSES

## MATHEMATICAL LEARNING PROGRESSIONS IN THE COMMON CORE GRADES 6-12: STATISTICS AND PROBABILITY

**August 19-23, Monday-Friday (3 credits) w/ Follow-Up Sessions 2012-13 (1 credit)**
**Time: 8:30-3:30 Location: TBD**
**Instructors: Julie Rierson**
**Summer Session Cost: 3 PSU graduate credits**

This course is designed for math teachers in grades 6-12. It will address the Common Core State Standards for Mathematics (CCSSM), focusing on the progression of standards in the area of Statistics & Probability. In addition, participants will discuss the pedagogical practices necessary to implement high-quality instruction that will provide opportunities for students to engage in the mathematical practices. Participants will learn the depth and span of the concepts in the Statistics & Probability progression and will investigate how to identify and incorporate appropriate mathematical practices that support the content goals. This class will incorporate the use of technology, including TI-84s and web-based applets, to support the learning of the mathematical content.

## USING PHYSICS TO BRING ALGEBRA 1 AND CCSS ALIVE

**Tentative: August 19-23 Monday-Friday (3 Credits)**
**Time: 9:00am-4:00 pm Location: Intel STEM Center**
**Instructor: Dennis Williams**
**Summer Session Cost: 3 PSU graduate credits**
There is a powerful connection between the long-term learning targets in Algebra 1 and a Patterns Physics class, especially through an integration of the Common Core State Standards Mathematical Practices. This course will explore how Algebra 1 teachers can use the data generated from a Conceptual Physics course to provide context and application to the functions explored in Algebra. Physics teachers will learn how the use of precise mathematical language, mathematical concepts and practices will enhance their instruction and bring a deeper understanding of the Physics concepts. Participants will collaboratively create units that integrate all the mathematical practices in a way that will make the Algebra come alive through connections to various context and application. Each unit will include formative assessment practices and summative assessments that incorporate the Mathematical Practices, Mathematics Content and connections to Physics.



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## SCI 510-INCREASING SCIENCE, TECHNOLOGY, ENGINEERING AND MATH RIGOR IN FRESHMAN PHYSICS

**June 24th-29th Monday-Friday 8:30-3:30 (3 Credits) w/Follow-up Sessions 2013-14 (2 Credits)**
**Location: Southridge High School**
**Instructors: Bradford Hill and Dr. Susan Holveck**
**Summer Session Cost: 3 PSU graduate credits**
**Note: 2013-14 School Year Follow-Up Sessions for an additional 2 PSU graduate credits**

This course will specifically focus on implementing an inquiry-based curriculum that explicitly addresses the Science, Technology, Engineering, and Math (STEM) standards as laid out in the Oregon State Standards and the Common Core State Standards for Mathematics. Teachers will learn how to guide students to proficiency through rigorous, experiential learning activities. This will primarily be achieved through teachers participating in guided instruction and producing artifacts they will use in their classroom. This course is continued into the school year, for an additional 2 graduate credits, with a focus on challenges of implementation and additional learning targets not covered in the summer course.



SECONDARY 6-12 SCIENCE COURSES

## SCI 510 CHEMISTRY PATTERNS AND PRACTICES

**August 6th-8th Monday-Wednesday (2 Credits) w/Follow-up Sessions 2013-14 (2 Credits)**
**Time: 9:00am- 4:00pm Tentative Location: Southridge High School**
**Instructors: Jomae Sica and Bradford Hill**
**Summer Session Cost: 2 PSU graduate credits**

This course focuses on intertwining the disciplinary core ideas of chemistry with the science practices as described in the Next Generation Science Standards. Teachers will experience means of using inquiry experiments and engineering design tasks to guide students through typical learning progressions. Participants will also explore means to engage students in the scientific and engineering practices when student data collection is not reasonable, such as mining existing data and simulations. Another strand of the course centers on using formative assessments that will target known misconceptions and help teachers move students along their learning continuum as assessed on a rubric. Time will be provided throughout the course for teachers to modify their present units in light of their learning. The course culminates with teacher sharing of their modified sequence implementation plan.

## SCI 510 BIOLOGY FOR THE NEXT GENERATION

**August 19th-23rd Monday- Friday (3 credits) w/3 Follow-Up Sessions 2013-2014 (2 credits)**
**Time: 9:00am- 4:00pm Location: Intel STEM Center**
**Instructors: Dr. Susan Holveck and Caitlin Everett**
**Summer Session Cost: 3 PSU graduate credits**
**Note: 2012-13 School Year Follow-Up Sessions for 2 additional PSU graduate credit**

As teachers transition to the Next Generation Science Standards, support is needed for shifting teacher pedagogical content knowledge and instructional practices that focuses on the core disciplinary ideas, cross-cutting patterns, and scientific and engineering practices. In this course participants will learn how science and engineering in a Next Generation Biology class involves integration of scientific explanations (biology content knowledge) and the practices needed to engage in scientific inquiry and engineering design. Teachers will use a standards-based-learning-system and a learning cycle instructional model (taking a core concept to conceptual understanding, graphical understanding and symbolic understanding) to increase student achievement for all students in Biology.



To Pre-Register And Save A Spot For Any Course(s) Complete the Form at: https://portlandstate.qualtrics.com//SE/?SID=SV_cZbd2IyX1RiGNGR

## SCI 510 VERNIER TECHNOLOGY AS A PATHWAY TO CONTENT AND PRACTICES

**Dates: Summer Online and Technology Enhanced (TBD) and In-Person Date (TBD) for 2 credits. Location: Tentative In-Person Session: Intel STEM Center)**
**Instructors: Melissa Potter**
**Summer Session Cost: 2 PSU graduate credits**

This course includes a hands-on workshop of Vernier data collection technology, including how to integrate the technology into science and math content and practices, but then allows for breakout strands to support teachers in their specific grade level or course strands. Participants will expand their knowledge for using the data collection devices to have an impact on increasing student higher order cognitive skills, application of content knowledge, and academic identity and resilience. Teachers will develop a plan for utilizing Vernier technology as a pathway for student achievement of the Common Core State Standards in Mathematics and the Next Generation Science Standards content and practices.





## SCI 510 TEACHING SCIENCE WITH PROJECT NANO

**June 24th-28th, July 2nd Monday- Friday and Tuesday (3 credits)**
**Time: 9:00am- 4:00pm Location: Tentative: Beaverton High School**
**Instructors: Mike Blok and Keith Grosse**
**Summer Session Cost: 3 PSU graduate credits**
Project NANO, (Nanoscience and Nanotechnology Opportunities), is a very unique, hands-on course that is standards focused and outcomes based. This course will provide teachers with a pedagogical system to build a variety of STEM technologies that integrate seamlessly into their curriculum. Project NANO specializes in the use and workings of the Phenom, (a table top Scanning Electron Microscope-SEM), dissecting and compound optical light microscopes (OLMs), and Image J freeware for image analysis. Through their own authentic science inquiry experiences, participants will learn to explore objects over a range (>15,000x) of magnifications to increase inquiry questions and student motivation for learning content and scientific practices. During the course, participants will design and test inquiry-based lessons centered on the Desktop SEM use in classrooms. Course participants are eligible to have the Project NANO toolkit (including the SEM) in their classroom for 2-3 weeks. Lesson plan delivery support and assessment tools for measuring student-learning gains are provided.

## SCI 510 TEACHING SCIENCE WITH PROJECT NANO ADVANCED PART 2

**June 19-21, Wednesday-Friday, and Wednesday, June 26th (2 credits)**
**Time: 8:30-3:30 Location: Tentative: Beaverton High School**
**Instructors: Mike Blok and Keith Grosse**
**Summer Session Cost: 2 PSU graduate credits**
Project NANO, (Nanoscience and Nanotechnology Opportunities), is thrilled to have over 60 trained teachers in the metro area using the Phenom desktop SEM and the Project NANO toolkits. This is a follow up course to provide collegial feedback, refining, coaching, and supports for further implementing nanoscience and nanotechnology in their classrooms. During the course, participants will share and receive feedback on their own lessons and test inquiry-based lessons from colleagues as they become more proficient on the Phenom desktop SEM. The time on the Phenom will refine and enhance microscopy skills and provide for extended applications. STEM lesson plan delivery/ methodology, classroom management, along with increasing rigor, learning targets and assessment tools for measuring student-learning gains will be emphasized.

To Pre-Register And Save A Spot For Any Course(s) Complete the Form at: https://portlandstate.qualtrics.com//SE/?SID=SV_cZbd2IyX1RiGNGR

PORTLAND METRO STEM PARTNERSHIP

Portland State UNIVERSITY

STEM Course Pre-Registration Survey Link: (Copy & paste link in browser, if needed.)

https://portlandstate.qualtrics.com//SE/?SID=SV_cZbd2IyX1RiGNGR

Please use the link to pre-register for all courses. ***This "soft" registration reserves your spot in the class and informs course-offering decisions***. Information for **official registration** and final class details will be available in May. Online summer registration for credit at PSU begins May 6th

***We will notify you via e-mail when it is time to do the formal registration for Portland State to secure final course enrollment.***

Portland State Registration information will be available at:
http://www.pdx.edu/registration/registration-basics

Summer tuition rates will be posted at: http://www.pdx.edu/bao/tuition-fees

Questions: Contact the Center for Science Education at
(503) 725-4243 or e-mail
Carol Biskupic Knight, STEM Center Professional Development Coordinator at: bis2@pdx.edu


## Intel STEM Center for College and Career Readiness

The Intel STEM (Science, Technology, Engineering, Math) Center for College and Career Readiness is part of a collective impact partnership between local school districts, higher education, businesses, community groups and informal education. Through this partnership, the Intel STEM Center will compile and disseminate information, research, and resources that serve the needs of schools in partnering districts to have all students college and career ready. Part of the Intel STEM Center's focus is to provide professional development to all teachers in the area of STEM education.

## Portland Metro STEM Contacts


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www.pdxstem.org

To Pre-Register And Save A Spot For Any Course(s) Complete the Form at: https://portlandstate.qualtrics.com//SE/?SID=SV_cZbd2IyX1RiGNGR

COMMON CORE STATE STANDARDS OREGON

# Common Core "Shifts"

**English Language Arts & Literacy**

There are six shifts that the Common Core State Standards (CCSS) **in ELA & Literacy in History/Social Studies, Science, and Technical Subjects** require of us if we are to be truly aligned with the CCSS in terms of curricular materials and classroom instruction.

| Shifts in ELA / Literacy | |
|---|---|
| **Shift 1: Increase Reading of Informational Text** | Classrooms are places where students access the world – science, social studies, the arts and literature – through informational and literary text. In elementary, at least 50% of what students read is informational; in middle school, it is 55%; and by the end of high school, it is 70% (CCSS Introduction, p. 5).<br><br>Increasing the amount of informational text students read K-12 will prepare them to read college and career-ready texts. |
| **Shift 2: Text Complexity** | In order to prepare students for the complexity of college and career-ready texts, each grade level requires growth in text complexity (Appendix A, pp. 5-17). Students read the central, grade-appropriate text around which instruction is centered (see exemplars and sample tasks, Appendix B).<br><br>Teachers create more time in the curriculum for close and careful reading and provide appropriate and necessary supports to make the central text accessible to students reading below grade level. |
| **Shift 3: Academic Vocabulary** | Students constantly build the vocabulary they need to be able to access grade-level complex texts.<br><br>By focusing strategically on comprehension of pivotal and commonly found words (such as "discourse," "generation," "theory," and "principled") teachers constantly build students' ability to access more complex texts across the content areas (Appendix A, pp.33-36). |
| **Shift 4: Text-based Answers** | Students have rich and rigorous conversations which are dependent on students reading a central text.<br><br>Teachers ensure classroom experiences stay deeply connected to the text and that students develop habits for making evidentiary arguments based on the text, both in conversation as well as in writing, to assess their comprehension of a text (Appendix A, p. 2). |
| **Shift 5: Increase Writing from Sources** | Writing instruction emphasizes use of evidence to inform or to make an argument; it includes short, focused research projects K-12.<br><br>Students K-12 develop college and career-ready skills through written arguments that respond to the ideas, events, facts, and arguments presented in the texts they listen to and read (Appendix A, pp. 24-26; student samples, Appendix C). |
| **Shift 6: Literacy Instruction in all Content Areas** | Content-area teachers emphasize reading and writing in their planning and instruction for teaching the content.<br><br>Students learn through reading domain-specific texts in history/social studies, science, and technical subjects and by writing informative/explanatory and argumentative pieces (CCSS Introduction, p. 3). |

OREGON DEPARTMENT OF EDUCATION

Reordered in 12/11, this document was originally adapted from *Common Core "Shifts"* originally published by *engage*$^{ny}$.

COMMON CORE STATE STANDARDS OREGON

# Common Core "Shifts"

**Mathematics**

The six shifts represent key areas of focus as teachers and administrators work to implement the Common Core State Standards for Mathematics (CCSSM). Oregon teachers are likely at different stages in practicing these shifts, however, establishing a statewide focus in these areas can help schools and districts develop a common understanding of what is needed in mathematics instruction as they move forward with implementation.

| Shifts in Mathematics | |
|---|---|
| **Shift 1: Focus** | Teachers understand how the CCSSM emphasizes concepts prioritized in the standards so that time and energy spent in the math classroom is focused on critical concepts in a given grade. Students develop a strong foundational knowledge and deep conceptual understanding and are able to transfer mathematical skills and understanding across concepts and grades. (CCSSM, 2010, p.3-5; NMAP, 2008, p. 15-20) |
| **Shift 2: Coherence** | Principals and teachers carefully connect the learning within and across grades so that students can build new understanding onto foundations built in previous years. A teacher's strong understanding of learning progressions helps them monitor a student's progress and intervene in a timely basis. A student's understanding of learning progressions can help them recognize if they are on track and can enable them to productively take more responsibility for improving their skills. (NMAP, 2008, p.20-22 ; Mosher, 2011; CCSSM, 2010, p.4) |
| **Shift 3: Procedural Fluency** | Students are *efficient* and *accurate* in performing foundational computational procedures without always having to refer to tables and other aids. Teachers help students to study algorithms as "general procedures" so they can gain insights to the structure of mathematics (e.g. organization, patterns, predictability). Students are able to apply a variety of *appropriate* procedures *flexibly* as they solve problems. Helping students master key procedures will help them understand and manipulate more complex concepts in later grades. (NRC, 2001, p. 121; CCSSM, 2010, p.6) |
| **Shift 4: Deep Conceptual Understanding** | Deep conceptual understanding of core content at each grade is critical for student success in subsequent years. Students with conceptual understanding know more than isolated facts and methods - they understand why a mathematical idea is important and the contexts in which it is useful. Teachers take time to understand the Standards for Mathematical Practice that describe the student expertise needed to develop a deep conceptual understanding of mathematics. (NRC, 2001, p. 118; CCSSM, 2010, p. 4, 6-8) |
| **Shift 5: Applications (Modeling)** | Teachers at all grade levels identify opportunities for students to apply math concepts in "real world" situations. The process of modeling, that includes choosing and using appropriate mathematics and statistics to analyze and understand situations, is key in improving decisions as well as linking classroom mathematics and statistics to everyday life, work, and decision-making. Students are expected to use math and choose the appropriate mathematical models even when they are not prompted to do so. (NRC, 2001, p. 124; CCSSM, 2010, p. 72-73; NMAP, 2008, p.49-50) |
| **Shift 6: Balanced Emphasis** | Students need to both practice and understand mathematics. There is more than just a balance between these two priorities in the classroom – both are occurring with intensity. Teachers create opportunities for students to participate in authentic practice and make use of those skills through extended application of math concepts. The amount of time and energy spent practicing and understanding is driven by the specific mathematical concept and therefore, varies throughout a given school year. (NMAP, 2008, p.45-46; NRC, 2001, p.115) |

Works referenced:

*Common Core State Standards for Mathematics (CCSSM). (2010, June).* Retrieved from Common Core State Standards: *http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf*

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National Research Council (NRC). (2001). *Adding it up*. (J. Kilpatrick, J. Swafford, & B. Findell, Eds.) Washington, DC: National Academy Press.

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