SERVICES & PRODUCTS

Systems

Uptisite

• 2 days of professional learning
  including student unit analysis
• 4–6 PLC meetings
• Student materials available for grades

Waves

• 1.5 days of professional learning
  including student unit analysis
• 4–6 PLC meetings.
• Student materials available for grades

Earth & Sun

• 1 day of professional learning
  including student unit analysis
• 4–6 PLC meetings.
• Student materials available for grades

AVAILABLE TOPICS

Improving student achievement in science with innovative teacher professional learning and classroom supports

WestEd
WestEd.org
Participants overwhelmingly rate Making Sense of SCIENCE (MSS) as the best, or among the best, professional learning of their career. The word they choose most often to describe their experience is transformative. Teachers reliably describe growth in their science knowledge and abilities, confidence in learning and teaching science, and increased student engagement in the classroom.

These reports have been substantiated by rigorous large-scale randomized control trials, which have shown statistically significant benefits to participating teachers and their students. A recent study found that students whose teachers participated with MSS demonstrated the equivalent of nearly six additional months of learning on a state standardized test.

The majority of our professional learning focuses on supporting teachers. In MSS Teacher Courses, teachers forge their own personalized learning path, guided by a facilitator and in collaboration with peers. They do the tough work of adult-level science, analyze student discourse and work, and connect these experiences to their own science and literacy instruction.

Other MSS courses follow a similar approach, but are tailored to different audiences. For example, our courses for science leaders include science sense-making and custom investigations to support site-specific work (e.g., facilitation skills, curriculum adoption efforts, and community building).

Our goal is for MSS professional learning to be intriguing and challenging for every participant regardless of their incoming experiences, knowledge level, and skill set. Our participants walk away with meaningful personal experiences, deepened knowledge and skills, and a greater internal motivation that propels them down the path of continued professional growth.

STANDARDS ALIGNMENT
Courses focus on key science content, and align well with state or national standards. Some courses offer specific connections to Next Generation Science Standards.

TARGET AUDIENCE
MSS offers courses for teachers, staff developers, and administrators. Teacher Courses are designed for teachers of specific grade bands, although teachers outside this range often participate quite successfully.

FORMAT
Each offering can be led as a Teacher Course, Administrator Course, or Leadership Course — or as a Facilitation Academy, which prepares attendees to lead the course themselves in the future. Courses are modular in design, making it possible to successfully offer full courses or excerpts of courses.

COST
For $3,000 per day, MSS provides an experienced facilitator and all the materials participants will use during the event. The daily rate does not include food service, participant stipends, or travel.

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COURSES
- Professional learning for teachers, support staff, and/or administrators
- Up to 24 participants per room
- Supplemental materials (e.g., student units, task banks, PLC protocols) are also available for purchase

FACILITATION ACADEMIES
- Professional learning that prepares providers (e.g., teachers, staff developers, professors) to facilitate a specific MSS Course in the future
- Up to 24 participants per room
- Resources required for leading future short courses (e.g., charts, handouts, teacher books) must be purchased separately. Resources for leading future 5-day courses can be purchased separately or printed at your site.

LEARN MORE ONLINE WestEd.org/mss
This Making Sense of SCIENCE course truly helped me understand the science beyond the basics so that I am a much better educator.

~ Carey
Classroom Teacher
Madison, WI

RESEARCH-PROVEN PROFESSIONAL LEARNING THAT MAKES A DIFFERENCE FOR TEACHERS AND STUDENTS
NGSS IMPLEMENTATION SUPPORT

Teachers who have been tasked with implementing next generation science learning typically want to know what this type of learning really looks like, how their standards support it, and most of all, what they can do with their students right now. Our Next Generation Science Implementation (NGSI) courses tackle these questions from multiple angles.

**Authentic next generation science learning experiences**
In MSS NGSI courses, teachers engage in adult-level science and engineering work that is multidimensional, phenomenon-based, and equitable. While this is the essence of next generation science learning, many teachers have never learned this way. As part of their experience, teachers engage in metacognitive conversations to unpack their own multidimensional learning and consider the instructional supports needed for creating this type of learning experience in the classroom.

**Collaborative evaluation of standards and student materials**
Teachers collaboratively analyze a student unit, searching for evidence of multidimensional, phenomenon-based, and equitable learning. They also discuss ways to adjust a student unit to best serve their specific contexts. For this purpose, we include grade-level specific teacher guides for MSS-developed next generation student units. However, any student unit can be discussed and analyzed (e.g., teacher developed units, existing curriculum).

**Optional student materials and PLC supports**
Digital downloads of corresponding student materials are available for purchase, should teachers want to implement the student units they analyzed during an NGSI course. A self-facilitated PLC protocol is also available to support continued collaboration throughout their NGSS implementation journey.

Finally, professional learning that gives me the experience of next generation science learning and the knowledge and skills I need. Pairing the adult learning with ready-to-implement student units is a great tool to support instruction in our science classrooms.

~ Leslie
K–12 Science Manager
Fresno, CA

PROFESSIONAL LEARNING DESIGNED FOR NEXT GENERATION SCIENCE TEACHING & LEARNING
TEACHER GUIDE with structured lesson sequences, detailed procedures, and optional paths to support differentiated learning

STUDENT MATERIALS with integrated literacy supports and multidimensional formative and summative assessments
<table>
<thead>
<tr>
<th>Details</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINI</td>
<td>MSS offers a wide variety of 60–90 minute professional learning activities suitable for introducing teachers, staff developers, administrators, and parents to inquiry-based learning. Choose from sessions on productive discourse, systems, modeling, and more!</td>
</tr>
<tr>
<td>HALF DAY</td>
<td>Far from memorizing facts about organelles, this course is designed to help teachers explore and understand the unity and diversity among the cells throughout the living world. <em>Science Investigation only.</em></td>
</tr>
<tr>
<td>1 DAY</td>
<td>Use rolling balls, zooming carts, and thought experiments to investigate the force of gravity between objects in various systems and explore acceleration due to gravity and orbital motion. <em>Science Investigation only.</em></td>
</tr>
<tr>
<td>1 DAY</td>
<td>Knowledgeable administrators and leaders are critical to establishing and sustaining a productive culture of science learning. This means knowing what high-quality next generation science instruction looks and feels like, as well as understanding how best to support teachers. These courses are customized for each site and vary in length from a half-day to two days.</td>
</tr>
<tr>
<td>1 DAY</td>
<td>Take a closer look at the structure and function of DNA and explore its many interactions within an organism. Examine the process of cellular reproduction and the role of gene regulation in multicellular organisms. <em>Science Investigations excerpted from the 5-day Genes &amp; Traits course.</em></td>
</tr>
<tr>
<td>1 DAY</td>
<td>Discover patterns and anomalies in solar paths, shadows, and monthly solar flux data. Use models to investigate and explain phenomena from the Earth-Sun system. Engage with a collaborative explanation development protocol and evaluate a student unit. <em>Science, Literacy, and Teaching Investigations. Includes the Teacher Guide for the MSS Sun &amp; Shadows Student Unit at grade 5.</em></td>
</tr>
<tr>
<td>1 DAY</td>
<td>Explore models for various geosphere interactions, real geosphere samples, and maps of Earth’s surface. Study the properties and features of Earth’s surface and connect them with the interactions by which they were formed. <em>Science, Literacy, and Teaching Investigations.</em></td>
</tr>
<tr>
<td>2 DAYS</td>
<td>Comprehensive next generation science implementation support for elementary teachers! Experience and analyze multidimensional, phenomenon-based, and equitable science learning centered around the crosscutting concept of systems. <em>Science, Literacy, and Teaching Investigations. Includes Teacher Guides for the MSS Systems Student Units at grades K, 1, 2, 3, 4, 5, and 6.</em></td>
</tr>
<tr>
<td>2 DAYS</td>
<td>Comprehensive next generation science implementation support for middle school teachers! Experience and analyze multidimensional, phenomenon-based, and equitable science learning centered around the disciplinary core ideas related to waves. <em>Science, Modeling, and Teaching Investigations. Includes Teacher Guide for the MSS Waves Student Unit for middle school.</em></td>
</tr>
<tr>
<td>3 DAYS</td>
<td>Take a systems approach to understanding organisms. Explore the roles of producers and consumers in food chains, evaluate their inputs and outputs, and examine the transfers of energy that occur within and among ecosystems. Build your knowledge and skills around scientific discourse and explore common student ideas related to life, seeds, and food chains. <em>Science, Literacy, and Teaching Investigations.</em></td>
</tr>
</tbody>
</table>
## COURSE OFFERINGS

<table>
<thead>
<tr>
<th>Subtopics</th>
<th>Supplemental Student Task Banks</th>
<th>Supplemental Student Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems, unity and diversity</td>
<td></td>
<td></td>
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<tr>
<td>Modeling, patterns, cause and effect</td>
<td></td>
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</tr>
<tr>
<td>Cause and effect, structure and function, modeling</td>
<td>For grades 5–12</td>
<td></td>
</tr>
<tr>
<td>Modeling, systems, patterns, constructing explanations</td>
<td>For grade 5</td>
<td></td>
</tr>
<tr>
<td>Cause and effect, patterns, systems, modeling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability and change, engineering design, modeling</td>
<td>For grades K–6</td>
<td></td>
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<tr>
<td>Modeling, energy transfers, cause and effect</td>
<td>For middle school</td>
<td></td>
</tr>
<tr>
<td>Systems, matter and energy, discourse</td>
<td>For grades K–8</td>
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</tbody>
</table>

## COURSE STRUCTURE

### DIVERSE COMPONENTS, DIVERSE VIEWS

MSS courses are made of a series of shorter investigations. Each investigation provides a different window into the arts of teaching, learning, and supporting science teaching and learning. We take this approach because we believe that to make sense of anything as complex as science learning and teaching, you need to see it from many different angles.

The most common format for MSS courses includes a Science Investigation, a Literacy Investigation, and a Teaching Investigation each day. Sometimes a Literacy Investigation or Teaching Investigation is replaced by a specialized investigation (e.g., a Modeling Investigation, a Leadership Investigation, or an NGSS Investigation) to best fit the needs of a particular audience.

The modularity of our courses makes them easily customizable — you are welcome to pick and choose the sections of courses that best fit the needs of your site. Because our investigations often build on one another throughout the day, it is important to analyze the benefits and limitations of planned adjustments. MSS staff are happy to discuss your ideas with you.

### ALL SCIENCE

If you want to focus on science content and practices, there are some MSS courses that are solely Science Investigations. Because science is inherently multidimensional, these courses still include opportunities for teachers to engage in a variety of practices such as data collection, experimental design, argumentation, reading, writing, and mathematical computations.

If we don’t have a science-only course in your desired topic area, you are welcome to customize a path comprising only the Science Investigations of a longer, more diverse course.
<table>
<thead>
<tr>
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<th>Course Description</th>
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<tbody>
<tr>
<td><strong>Matter</strong></td>
<td>Delve into the topic of matter by first exploring phenomena and then working toward explaining those phenomena with particle-level models. Investigate classic topics such as the properties of matter, chemical reactions, physical changes, and periodic tables in new ways. Build your skills with reading discipline-specific science texts and supporting students in doing the same. Analyze common student ideas related to matter. <em>Science, Literacy, and Teaching Investigations.</em></td>
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<tr>
<td>5–12 teachers</td>
<td></td>
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<tr>
<td><strong>Energy</strong></td>
<td>Explore the very abstract topic of energy in different contexts, from wind-up toys to rockets and food webs. Compare various definitions of energy and identify systems where energy is conserved and systems where it is not. Build your skills around writing in science and supporting students in doing the same. Analyze common student ideas related to energy. <em>Science, Literacy, and Teaching Investigations.</em></td>
</tr>
<tr>
<td>6–8 teachers</td>
<td></td>
</tr>
<tr>
<td><strong>Genes &amp; Traits</strong></td>
<td>Take a closer look at the structure and function of DNA and explore its many interactions within an organism. From observable traits to microscopic interactions, this course investigates the internal and external interactions that affect genetic and epigenetic inheritance from cell to cell and organism to organism. Build your knowledge and skills around scientific discourse and explore common student ideas related to the origins of traits and the role of DNA in cells. <em>Science, Literacy, and Teaching Investigations.</em></td>
</tr>
<tr>
<td>5–12 teachers</td>
<td></td>
</tr>
<tr>
<td><strong>Force &amp; Motion</strong></td>
<td>Use multiple representations to make sense of motion, balanced and unbalanced forces, friction, and acceleration. Move from the observable to the abstract by first describing the ways things move using words, actions, images, and symbols and then exploring the forces that cause these changes in motion. Build your skills with reading discipline-specific science texts and supporting students in doing the same. Analyze common student ideas related to force &amp; motion. <em>Science, Literacy, and Teaching Investigations.</em></td>
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<td>6–8 teachers</td>
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</table>
NEW COURSES COMING FALL 2018!

3–DAY COURSES

Earth’s Atmosphere
Investigate conduction, convection, and radiation, as well as their roles in local weather and regional and global climate. Science, Literacy, and Teaching Investigations.

Earth Systems
Investigate Earth, the hydrosphere, and the geosphere using a systems approach. Along the way, dive into modeling and the particulate nature of matter. Science, Literacy, and Teaching Investigations.

1–DAY COURSES

Multidimensional Science Learning
Next generation science is multidimensional. Use a simple set of circuit materials to explore the design of learning activities that integrate disciplinary content, science and engineering practices, crosscutting concepts, literacy, and math. Science and Teaching Investigations.

HALF–DAY COURSES

Size & Scale
Focuses on the crosscutting concept of scale, proportion, and quantity, as well as its role in biological systems, including cellular diffusion. Science Investigation only.

Chemical Potential Energy
Explores the various types of potential energy and what it really means for a system to have potential energy. Science Investigation only, excerpted from the MSS Energy course.

Modeling Inheritance
Investigates the inheritance of traits that occurs as a result of sexual reproduction, using an easy-to-build model organism. Science Investigation only, excerpted from the MSS Genes & Traits course.

MIX AND MATCH COURSES TO BUILD A CUSTOM PROFESSIONAL LEARNING PATHWAY
SITE-BASED SUPPORT

MSS provides technical support to schools, districts, and states. MSS can help develop short and long-term plans, consult on program implementation and evaluation strategies, or simply provide co-planning or troubleshooting assistance. MSS also offers coaching to help adult learners improve their practice. MSS coaching combines a focus on school, district, and individual goals with effective pedagogical practices for both students and adults.

CUSTOM EXPERIENCES

The MSS team has a passion for creating custom courses to meet sites’ specific needs. In fact, many of the courses we currently offer were initially developed as custom courses for districts, states, and schools. Custom courses can be built from scratch or created using excerpts from existing courses. MSS welcomes sites to collaborate on custom development. Costs vary based on the specifics of the development project.

MSS MASTERS PROGRAM

Individuals looking to hone their facilitation skills can enroll in the MSS Masters Program. Participants progress through a series of facilitation investigations and develop a personalized facilitation growth plan to gain certification as an MSS Master. Benefits of the program include a discount on MSS products and services, optional outreach and promotional support, and personalized guidance from senior MSS staff.

CONTENT ASSESSMENT & ANALYSIS

Making Sense of SCIENCE assessments can be used to gauge growth in knowledge in specific content areas as the result of an intervention, such as professional learning, curriculum use, or mentoring. In partnership with Heller Research Associates, we analyze pre- and post-test data and provide individualized reports complete with statistical analysis (e.g., gain scores) and visual representations. Assessments are available in many content areas. Inquire for details.

FOR MORE INFORMATION...

CONTACT US!
To learn more about our services and products, please contact Patrick Moyle (mssevents@wested.org or 510.302.4219).
SUPPORTING MATERIALS

COURSE MATERIALS
All MSS professional learning is supported by comprehensive materials. These materials, including Teacher Books, Facilitator Guides, handouts, and charts provide the scaffolding and background information required to participate in and lead MSS professional learning.

PROFESSIONAL LEARNING COMMUNITY (PLC) SUPPORT
MSS offers self-facilitated protocols that support PLCs. Each protocol is designed to be self-facilitated and promote collaboration and peer-to-peer engagement.

STUDENT MATERIALS
MSS offers Task Banks of assessments that go beyond simple recall to promote critical thinking and reasoning. Comprehensive Student Units featuring differentiated learning tracks and a variety of formative and summative assessments are also available in conjunction with MSS professional learning.

FREE RESOURCES!
We have compiled a library of resources designed to support and accent the work of Making Sense of SCIENCE. These resources are informative and helpful for teachers both in and out of the classroom.

ORDER TODAY!
Each fall, Making Sense of SCIENCE hosts a national conference for teachers, teacher leaders, and administrators. The conference provides professional learning and facilitation training in a wide range of short courses — and an opportunity for educators to collaborate in a beautiful setting. This year’s programming includes:

- Next Generation Science Implementation courses (Systems, Waves, Earth & Sun)
- Half-day science content courses (Size & Scale, Modeling Inheritance, Chemical Potential Energy)
- A support course for designers of multidimensional science learning
- Excerpts from our 3-day Earth’s Atmosphere course

$1800 fee includes programming, materials, lodging, and most meals. Contact us for information about scholarships!