

NAEP results, OSTA pre-reg, NGSS for Middle School, NGSS4Oregon Teams, Outdoor Science, PMSP Workshops, Outdoor School, ADI, SOREEL, Field-Based Inquiry



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OREGON STUDENTS' ATTITUDES AND CAPABILITIES IN SCIENCE

By Cary Sneider

The National Assessment of Educational Progress (NAEP), also known as The Nation's Report Card, is the largest nationally representative and continuing assessment of what America's students know and can do in various subject areas. Assessments are conducted periodically in mathematics, reading, science, writing, the arts, civics, economics, U.S. History, geography, and technology and engineering literacy.

The NAEP Science assessment measures students' knowledge of three broad content areas—physical science, life science, and Earth and space sciences—and four science practices—identifying science principles, using science principles, using scientific inquiry, and using technological design. These four practices describe how students use their science knowledge by measuring what they are able to do with the science content. More than “fill in the bubbles,” students are asked to construct responses, and apply science to problem scenarios presented graphically and through videos on computers. Responses are scored individually by trained scorers.

Results of the 2015 Science assessment in grades 4, 8, and 12 were reported for the nation overall for demographic groups, such as race/ethnicity, gender, and highest level of parental education and for 46 participating states and one jurisdiction at grades 4 and 8. Results were based on a representative sample of 115,400 fourth-graders from 7,650 schools, 110,900 eighth-graders from 6,050 schools, and 11,000 twelfth-graders from 730 schools. National samples of schools and students were drawn from each state and from the District of Columbia and Department of Defense schools. (The relatively small sample for NAEP Science at grade 12, meant that state level results were not available. Similarly, the Technology and Engineering Literacy Assessment in 2014 was only reported for the nation as a whole.) Results are available at the following websites: [NAEP Science](#) and [NAEP Technology & Engineering Literacy](#).

NAEP science results are available online by state for grades 4 and 8. As shown in the table below, comparing the performance of Oregon students and the national average, Oregon students were in the middle of the pack—not statistically

different from the national average at either the 4th or eighth grade level. To interpret these results, it's helpful to consider that Proficient means "solid academic performance and competency over challenging matter." In other words, only 37% of our fourth graders and 36% of our eighth graders demonstrate solid academic performance. That contrasts with some other states with similar rural areas and low population, such as New Hampshire, whose students performed near the top of the scale, with 51% 4th graders and 46% 8th graders at the proficient or advanced level.

2015 Science	Below Basic	Basic	Proficient	Advanced
4th grade national	25%	39%	36%	1%
4th grade Oregon	25%	39%	36%	1%
8th grade national	33%	34%	31%	2%
8th grade Oregon	28%	36%	35%	1%

In addition to NAEP "operational" items that measure knowledge and skills, NAEP also administers "contextual" items to teachers, and school administrators to collect information about students' opportunities to learn, and from students to learn about their educational experiences and attitudes. [A report of these results is now available on the NAEP website.](#)

This report reveals a disturbing finding for Oregon students, especially at the fourth grade level. In response to questions about their interest in science, Oregon is tied for last place with Indiana. By eighth grade Oregon students are more positive about science, but still below students in the majority of states. One can only imagine how our students' performance scores would be higher—and their prospects for post-secondary experiences and STEM careers—if greater attention were given to increasing their interest in science, technology, and engineering, especially during the critical elementary years.

Cary Sneider is a Portland Resident, Visiting Scholar at Portland State University, and member of OSTA. He is also a member of the National Assessment Governing Board, which sets policy for NAEP assessments.

A note from OSTA:

As dedicated science educators who read TOST and engage with OSTA, we recognize you as not part of the problem defined above, **but the solution**. Below we have included further resources in the hopes that you can continue to advocate in your school and district for increased elementary science minutes. We thank you for all you do in your respective roles to bring high-quality science to your students.

At OSTA, we believe that the antidote to low student interest and performance in science is both increased science instructional minutes, and perhaps even more importantly, NGSS-aligned science. By design, aligning to the NGSS means students are engaging in self-directed, collaborative, hands-on learning experiences, which [are shown to increase student engagement and achievement](#) (note: little research is available on the effects of the NGSS because they are so new, so the linked

article reviews available research of Project Based Learning, which shares similar features).

[What Is the Impact of Decline in Science Instructional Time in Elementary School?](#) This report, by Dr. Rolf K. Blank, provides additional insight into the effects of decreased science instructional minutes on NAEP scores (page 9) and frequency of hands-on science activities (page 17).

[Unlocking Learning: Science as a Lever for English Learner Equity](#) This report from WestEd in California lays out a blueprint for increasing access and achievement in science for English learners. Included in the report are research findings that indicate weaving together science and language development can increase students' academic performance in reading, writing, and science simultaneously.

[Will new standards improve elementary science education?](#) This Hechinger Report article dives in to the lack of elementary science instruction for many students, and features Cristina Trecha from the [Oregon Science Project](#) and Jennifer Callahan's kindergarten class in Redmond as positive examples of where science education is headed.

PRE-REGISTER FOR THE OSTA FALL CONFERENCE ON SCIENCE EDUCATION

Registration for the OSTA Fall Conference on Science Education is open! [Enjoy a \\$40 discount when registering through the month of August.](#) See you in Newport!

NGSS FOR MIDDLE SCHOOL TEACHERS

This **August 6-10** workshop is an active, hands-on experience designed for middle school science teachers who want to see what NGSS looks like in the classroom and to learn about the instructional shifts that are needed for the implementation of NGSS. Teachers will explore how lessons and units in earth, life and physical sciences can be three-dimensional – including the three components of the NGSS: Crosscutting Concepts, Disciplinary Core Ideas, and Scientific & Engineering Practices.

Teachers will actively conduct investigations and design engineering solutions to problems in science that can be used in 6th, 7th, and 8th grades. You will walk away with strategies and resources that can be used right away, and the tools that will help you to "Next-Genify" lessons you are currently using. NGSS 3-D assessment, student discourse, and anchoring phenomenon that drive instruction will be featured. Many resources will be provided as well as ready to use lessons.

This OSTA-sponsored course is taught by instructors Susan Holveck and Berkeley Gadbow. Berkeley is currently teaching middle school and has been implementing the lessons and activities that you will learn in her classroom. Susan guides teachers in NGSS implementation for grades K-12 in the Beaverton School District. [To register, click here.](#)

THE OREGON SCIENCE PROJECT: SUMMER '18 NGSS4OREGON TEAMS

Sign up for an NGSS4Oregon Summer '18 Team and join the statewide network of over 200 K-12 educators leading the conversation around NGSS. After completing these NGSS modules you will be an Oregon Science Project educator with access to more professional learning opportunities during the '18-'19 school year.

[Click here for more information and to sign up.](#) Please sign up by August 3.

Cost: Earn 40 PDU's (\$75) or 2 credits (\$75 plus \$100 per credit).

ALL levels of teaching experience and NGSS experience welcome. Elementary teachers are especially encouraged to join a team!

Pendleton

August 6th: In Person 9am-3pm AND **August-November:** 10-15 hours of online follow up in real time on your own and via video with other educators.

The Dalles

August 16th: In Person 9am-3pm AND **August-November:** 10-15 hours of online follow up in real time on your own and via video with other educators.

All NGSS4Oregon Teams are led by current classroom teachers who are trained Oregon Science Project Learning Facilitators.

OUTDOOR SCIENCE EDUCATION ON SCHOOL GROUNDS

Join the Lower Columbia Estuary Partnership's team of experienced outdoor educators for a day of learning how to make outdoor education a regular part of your school year curriculum. When: Wednesday **August 8**, 2018 9:00am-3:00pm. Location: East Multnomah Soil and Water Conservation District office.

Topics this workshop will cover:

- Using school grounds for inquiry-based science activities.
- Ready-made science lessons and activities that integrate Common Core State Standards and NGSS.
- Best practices for leading successful and safe outdoor learning activities.
- Resources available for loan from the Estuary Partnership.
- How to overcome real or perceived barriers to bringing the learning outdoors.
- Peer learning and celebrating what you do already!

6 PDUs will be offered for this workshop. For questions email Tonya McLean tmclean@estuarypartnership.org or call, at 503.226.1565 x244. [Click here to register.](#)

PORTLAND METRO STEM PARTNERSHIP SUMMER WORKSHOPS

PMSP is offering two high school NGSS courses in August: Chemistry for the Next Generation 2, and Physics for the Next Generation, both taking place **August 6-10**. These workshops support the implementation of the NGSS-aligned high school

curriculum developed by our partnering districts and PMSP TOSAs. To learn more about each course, and register, [visit PMSP's website](#).

UPRIVER: A STORY MAP CURRICULUM TO EXPLORE WATERSHED CITIZENSHIP

This **August 12-13th** workshop, designed for Oregon middle and high school teachers, is based on the Oregon film Upriver. Over the course of two days in Silver Falls, Oregon, you will consider what it means to be a global water citizen and explore tools and resources to help you bring these lessons into your classroom. No matter what discipline you teach, you will find lessons and activities around clean water useful for all students. With funding provided by Meyers Memorial Trust, Oregon middle and high school teachers are eligible for a \$200 stipend. [Learn more and register here.](#)

WILD ABOUT OUTDOOR SCHOOL

This workshop will provide methods and strategies to increase teachers' ability to enhance and extend their students' outdoor school experience. Participants will come away with the content knowledge, skills and materials to develop and use natural resources-based lessons aligned with outdoor school curricula, state standards, and statewide environmental literacy programs that can be used in the field or the classroom before or after their students attend outdoor school. Lunch is provided. Salem Keizer teachers will receive a \$50 stipend for attending; details will be provided at the workshop. This workshop is offered at no cost to Oregon educators. Guides, curriculum, and resources are offered at no cost to educators that attend the entire workshop. This workshop is designed for 5th & 6th grade educators and non-formal outdoor school educators. The workshop will be held at Oregon Garden in Silverton, OR on **August 13, 2018** from 9:00am-4:00pm. [Click here for more information.](#)

ARGUMENT-DRIVEN INQUIRY FOR GRADES 6-12

This **August 13-14th** workshop in Clackamas is an introduction to the Argument-Driven Inquiry (ADI) instructional model. Participants will first learn about the limitations of typical laboratory instruction and why ADI can help all students develop the knowledge and skills they need to be proficient in science. Participants will learn about the ADI instructional model by participating in all eight stages of an actual ADI lab investigation from start to finish. [Click here for more information, and to register.](#)

SOUTHERN OREGON REGIONAL ENVIRONMENTAL EDUCATION LEADERS AUGUST INSTITUTE

August institute is a FREE three-day experience (with optional day-four field trips!) in which participants attend sessions and field trips aimed at providing educators the resources and support to integrate environmental education into their curriculum.

August Institute 2018 is about:

- Exploring how place-based learning inspires students to soar
- Walking away with resources, confidence, and content
- Discovering funding resources, bus grants, and more
- Joining optional field trips to regional locations

Institute will meet at the Science Works Museum in Ashland and various locations from **August 13-16**. [Click here for more information and to register.](#)

APPLY FOR A SCHOLARSHIP TO ATTEND THE 2018 ENVIRONMENTAL EDUCATOR CONFERENCE

The Environmental Education Association of Oregon is hosting their [2018 conference](#) September 28-30, 2018 in Canby Grove. Conference registration includes meals, lodging and a EEAO membership. Scholarship application deadline is **August 15**. Order in which application is received will factor into awarding process. [Click here for more information on applying.](#)

FIELD-BASED SCIENCE INQUIRY

This **August 15-16** workshop at Opal Creek Ancient Forest Center will provide hands-on opportunities in the field as well as classroom time to develop curriculum tools and strategies that promote student-driven field-based science inquiry projects from kindergarten through high school. Attending teachers can also apply for a \$2,000 grant (\$6000 if you work collaboratively with at least two other teachers) for classroom equipment and resources for field-based inquiry investigations from the Diack Ecology Education Program. Participating teachers will receive a \$100 stipend for attending as well as lodging and meals. [View the flier for more information and to register.](#)

UPCOMING SCIENCE EVENTS AND PROFESSIONAL DEVELOPMENT

([CONTACT US](#) IF YOU HAVE INFORMATION ABOUT FUTURE EVENTS)

Online learning

- [Performance Assessments in the NGSS classroom: Implications for Practice.](#) Self-paced until 8/31
- [Developing Instructionally-Embedded Performance Assessments for the NGSS Classroom.](#) Self-paced until 8/31
- [Cascadia Earthquake Education course.](#) Self-paced. Email for registration information.
- [UO Real Solutions for NGSS Science Teaching.](#) Self-paced.
- [Ship to Shore Connections with the R/V Falkor.](#) Dates available through 12/18. Grades 5+

Central Oregon and the Columbia Gorge

- [NGSS4Oregon The Dalles](#), August 6
- [SuperQuest Redmond](#), August 8-10

- [SuperQuest Columbia Gorge](#), August 21-23
- [Discover Nature Festival](#), September 9

Greater Oregon

- [NGSS4Oregon Pendleton](#), August 16

Lane County

- [2018 Summer Teaching, Learning, and Assessment Institute](#), August 1-3
- [STILTS Summer Institute - Strategies for Inquiry Learning and Teaching Science](#), August 6-9

Oregon Coast

- [Diving In To Oregon's Kelp Forests](#), August 3
- [Finding the Hook](#), August 13-16

Portland Metro

- [NGSS for Middle School Teachers](#), August 6-10
- [Chemistry for the Next Generation](#), August 6-10
- [Physics for the Next Generation](#), August 6-10
- [Outdoor Science Education on School Grounds](#), August 8
- [Introduction to the NGSS](#), August 9
- [NGSS Collaboration](#), August 9
- [Argument-Driven Inquiry for Grades 6-12](#), August 13
- [NGSS Field Education](#), August 17
- Register now: [EEAO Conference](#), September 28-30

South Metro-Salem

- [Upriver: A Story Map Curriculum to Explore Watershed Citizenship](#), August 12-13
- Register now: [EEAO Conference](#), September 28-30

Southern Oregon

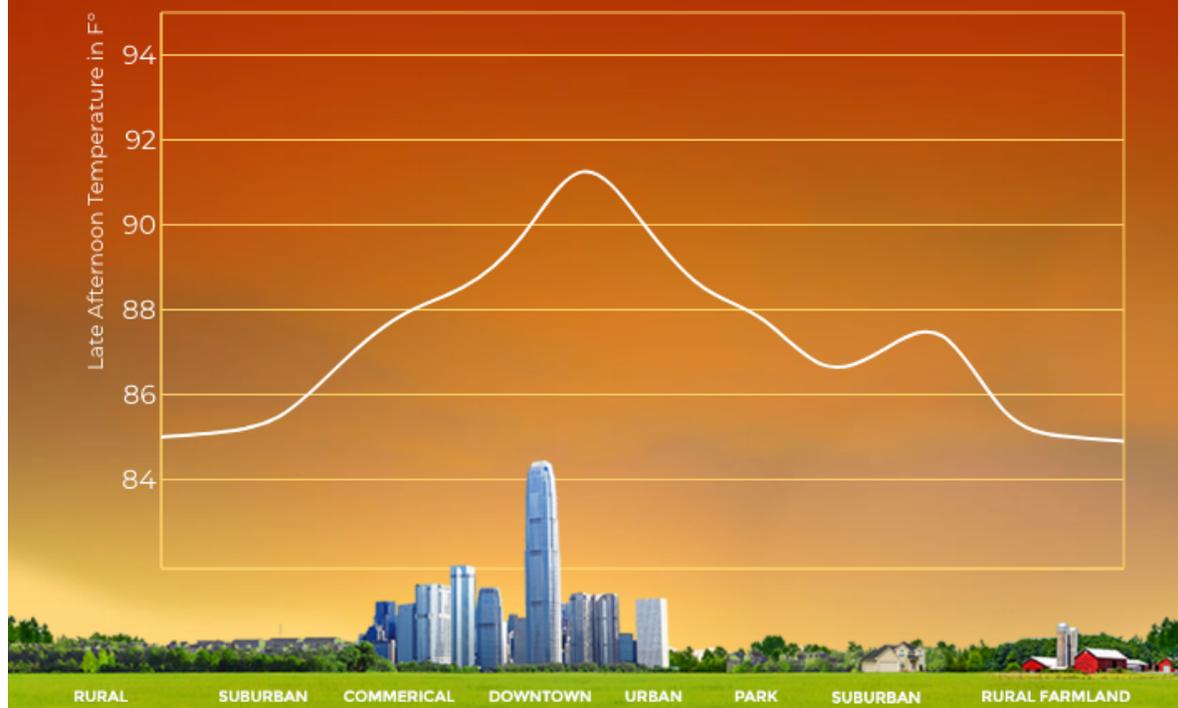
- [SOREEL August Institute](#), August 13-16
- [Umpqua Valley STEAM Institute](#), August 13-17
- [SuperQuest Southern Oregon](#), August 14-16

THIS MONTH'S PHENOMENON: URBAN HEAT ISLANDS

Phew! July was HOT. With the exception of the Oregon Coast, Oregonians have been on the hunt for the coolest places to spend the day. This month's phenomenon, urban heat islands, is inspired by the heat wave many of us experienced in July, and involving students in planning climate resilient communities.

Cities Are Hotter: Urban Heat Island

The roads, buildings, and infrastructure in urban areas make cities much hotter than rural areas, which often have more plants and trees. **57 of the 60 cities** analyzed had measurable urban heat islands over the past 10 years. In the summer, temperatures can be as much as 15-27°F hotter in cities.



Data shows that temperatures are increasing faster in urban areas than in surrounding rural areas, which has the potential to negatively impact human health. In fact, Portland has the fourth highest heat island effect (meaning the difference between Portland temperatures and surrounding rural areas is greater than most cities). The [PDX Resiliency app](#) takes localized climate data one step further and assesses the city of Portland by temperature, access to air conditioning, local air quality and more, highlighting who might be most vulnerable to rising temperatures and where to focus mitigation efforts.

Most of Oregon is not urban - are there localized heat island effects that can be detected in rural areas, too?

One way to help students better understand heat islands is to study microclimates on the schoolyard. [Annenberg Learner's Journey North](#) website provides lessons that are centered around [planting a pollinator garden](#) in the part of the schoolyard that is most similar to the local climate. Students map the schoolyard and take temperature data at different locations over a period of time. With the data students have taken, they can then propose design solutions to cool the schoolyard on hot days. (These activities would align well to the [NGSS third grade Weather and Climate standards](#))

What other Disciplinary Core Ideas would students need to know to understand the phenomenon of urban heat islands? How do heat waves impact your community?

Contact us!

