

NGSS NOW

10 things you need to know about the NGSS this month (and a  science fact)



April 2016

1 NGSS EQUiP in Action: Revised Lessons

Through a project with the New York Hall of Science (NYSCI) and Achieve, [Teachers TryScience](#) now features a growing set of resources that demonstrate how educators can use the [Educators Evaluating Quality in Instructional Products \(EQuIP\) rubric for Science](#) to evaluate and revise existing K-12 lessons in order to better meet the goals of the NGSS.

Each of the lessons (16 in total) are accompanied by an interim version of the lesson as well as a completed EQuIP rubric. Together, these resources are intended to highlight how the rubric, and peer feedback, helped NYSCI educators better identify and address each lesson's strengths and weaknesses.

While these lessons are not exemplars of NGSS-designed lessons, the EQuIP review process has helped make them more rigorous, more engaging, and ultimately more informative for teachers. More importantly, the EQuIP review process can serve as a guide for teachers who are transitioning their own lessons toward the NGSS.

We encourage educators to continue using the EQuIP rubric to revise these lessons - as well as their own materials - to more closely meet the goals of the NGSS for all students.

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2 Bundling Standards

The concept of "bundling" NGSS performance expectations (PEs) has been presented in a Question of the Month in [past issues](#) of NGSS Now. This month features an example of how middle school PEs* could be bundled in order to develop an instructional unit that engages students in science phenomena.

[MS-LS4-4](#) Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.

[MS-LS4-6](#) Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in a population over time.

[MS-ETS1-1](#) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

As Network States implement the NGSS, teachers, principals, and district leaders might consider the questions below when discussing how to align instruction to the standards:

a. What type of lessons can teachers

3 Science Phenomenon

Since 1961, [MRSA](#) (methicillin-resistant *Staphylococcus aureus*) has been found in hospitals.

Staphylococcus aureus (staph) is a kind of bacteria that can infect humans. Staph infections generally result in minor skin irritations, but can involve serious infections for people who are already ill or have a weak immune system. Staph can be present on healthy people without being part of an active infection. Often, more serious infections occur when staph is introduced inside the bodies through surgical wounds or catheters. Methicillin is an antibiotic that was developed to replace penicillin when doctors began finding penicillin-resistant strains of *Staphylococcus aureus*.

One of the shifts in the NGSS is to focus instruction on engaging students with meaningful phenomena that can be explained through the application of SEPs, CCCs, and DCIs.

Below are some high-level lines of student inquiry that could help facilitate their understanding of DCIs related to this month's featured science phenomenon:

- Why are bacteria resistant to penicillin?
- Why does staph infect humans?
- Aside from hospitals, where else might staph be found?

To see some additional ways that educators are engaging students with phenomena, go [here](#) and [here](#).

develop to help students build toward this bundle of PEs?

b. How could a classroom discussion about this month's "Science Phenomenon" (see right) help engage students around this bundle of PEs?



**For a more in-depth look at these NGSS PEs and to search for others read more [here](#). Need more context? See where these ideas are introduced in [A Framework for K-12 Science Education](#) (pages [163](#), [164](#), and [204](#)).*



Q: Since concepts in the NGSS build over time, how can I be sure that I'm teaching middle school content rather than the related content from grade 5 or high school?

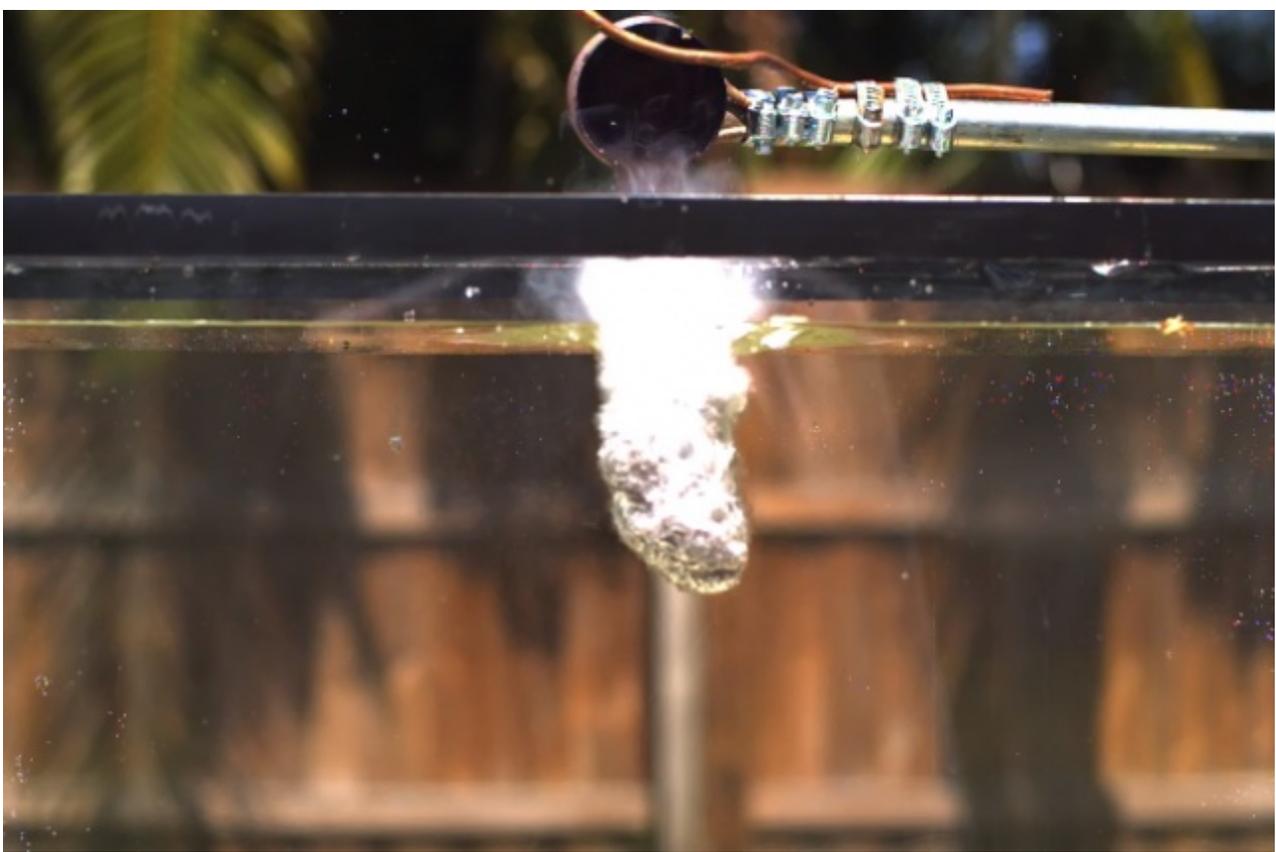
A: One of the conceptual shifts of the NGSS is the way science concepts build coherently from K-12. [Appendix E, Disciplinary Core Idea Progressions in the Next Generation Science Standards](#) shows how each of the DCIs is structured to reflect increasing sophistication of student thinking as they are articulated from Grades K-12. Reviewing this information can be a useful way to take a quick look at the content taught above and below a particular grade band or level.



**SCIENCE
FUN FACT**

Watch what happens if you put molten salt into a water tank.

[Click here](#) to see a high-speed video of molten salt being poured into a tank of water. A number of changes occur, but most dramatically-an explosion breaks the walls of the container! The explanation of this phenomenon is multifaceted, but asking questions about phenomena like this leads to rich science learning.



5 Creating Course Pathways for Advanced Students: An Example from the NGSS

Join us on April 21st from 3:00-4:00 p.m. EDT for a webinar to learn about the Accelerated NGSS Model Course Pathways and how educators can think about and develop pathways that allow gifted students to go beyond the foundational standards in any content area.

[Click here](#) to register now. After registering, you will receive a confirmation email containing information about joining the webinar.

NGSS in the News

6

[Chippewa Valley teacher writes new curriculum emphasizes critical thinking skills](#)

by Mike Lerchenfeldt, *Macomb Daily*
March 22, 2016

"Students were asked the questions: Is there a relationship between frequency, wavelength, and speed? If so, what is it? If not, why?"

7

[New Michigan State Standards for Science \(Parent FAQ\)](#)

by Megan Kruegar, *Metroparent Daily*
January 1, 2016

"Between 2017 and 2020, the state of Michigan science standards for K-12 students are shifting. Here's what parents can expect to see

"Each small group developed a model using a slinky, meter stick, and stopwatch. As a whole group, we planned an investigation for the small groups to carry out.

"All students collected data. They analyzed the data and computed averages in search of a mathematical pattern or proportional relationship.

"I was impressed with their organized data tables and graphs. If students found a mathematical relationship, they were asked to construct an equation or formula to compute quantities."

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8

[Teachers in training try out science lessons at Miller Elementary](#)

by Abby Spegman, *The Bend Bulletin*
February 10, 2016

"Students in OSU-Cascades' Master of Arts in teaching program took over every classroom...to guest teach a two-hour science lesson.

"The teacher candidates got classroom experience, the elementary students learned new material and the Miller teachers got ideas on how to work more science into their already-busy curriculum."

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9

[Changing way schools teach science](#)

by Suzan Locke, *Burlington Free Press*
March 22, 2016

"The biggest change with NGSS is not what you teach, but how you teach. Regardless of different experiences or learning styles - all students can contribute because all students have ideas."

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10

[New Delaware science standards turn students into thinkers](#)

by Megan Szabo, *Delaware State News*
February 19, 2016

"Students have become so focused on getting the 'right' answer that they do not care if it is spoon-fed to them by the teacher, even if that means they do not have to think for themselves.

"The Next Generation Science Standards, Delaware's new K-12 science standards, are empowering me to change that. The new standards are being implemented in districts across Delaware."

in kids' classrooms.

"In November 2015, the Michigan State Board of Education adopted new K-12 Michigan state standards for science. While these won't be fully implemented until roughly 2020, parents might be curious how this shift in performance expectations will shake out in their kids' classrooms and on the Michigan Student Test of Educational Progress standardized test (M-STEP) - primarily between 2017 and 2020."

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