NGSS Resources

NGSS 5 Innovations The NGSS Innovations are the five most significant ways the NGSS advance science teaching and learning, when compared to previous standards and typical instructional and curricular practice in American schools. They build on the conceptual shifts described in Appendix A of the NGSS using lessons learned by educators, researchers since implementation efforts began to bring clarity, and focus to what is truly innovative in the NGSS. As the key ways that the NGSS are new and different, these innovations also provide the intellectual framework PEEC uses to evaluate science instructional materials. This section describes each of the five NGSS Innovations and provides insight on how these innovations should be expected to appear in instructional materials.

Phenomena

Understand more about using phenomena in your NGSS classroom:

- **Criteria for Evaluating Phenomena:** Before beginning, identify the DCI element you wish to target with the phenomena, and then ask the following questions…
- **Using Phenomena in NGSS-Designed Lessons and Units:** This document answers these questions:What are phenomena in science and engineering? Why are phenomena such a big deal? How are phenomena related to the NGSS and the three-dimensional learning? How do we use phenomena to drive teaching and learning? What makes phenomena effective for use in instruction?
- **STEM Teaching Tool 28:** Qualities of Anchor Phenomena
- **Using NGSS Phenomena to Engage Students**: TJ McKenna, Staff Scientist for the Connecticut Science Center and Charles H. Barros STEM Academy, discusses how phenomena-driven instruction motivates students to be the scientist we know they naturally are. Read the **blog** if you don't have time to watch the webinar.
- **Assessing Three-Dimensional Performance: Phenomena and Problems** this resource from Achieve "provides educators and assessment developers with recommendations for phenomena that can support all students and reveal students' ability to sense-make using the three dimensions."
- **Unwrapping and aligning phenomenon**

Search for phenomena for your NGSS classroom:

- **Master List of Phenomenon** from Paul Andersen's **Wonder of Science** website: "an open Google doc that lists all phenomenon we have aggregated. These phenomenon will be tagged and added to the website (with relevant links, videos, and images) over time."
- Searchable Phenomena: **https://www.ngssphenomena.com/**

StemTeachingTool#58: How can science instruction leverage and develop student interests? Short answer: In so many different ways!

Cross Cutting Concepts

Learn about Crosscutting Concepts

- **All CCC and their progressions from NSTA hub**
- **What Do I Do With Crosscutting Concepts?** By Cary Sneider
- **Using Crosscutting Concepts To Prompt Student Responses Science.pdf:** The purpose of this primer is to encourage K-12 educators to use consistent and clear prompts structured around the crosscutting concepts to provide a common scientific language that students and teachers use as they engage in the formative assessment process.
- **Expected Student Performances Specific to the Crosscutting Concepts**
- **Assessing three-dimensional performance: crosscutting concepts**-This resource rom Achieve "describes how assessment tasks frequently include crosscutting concepts (CCCs), and discusses which approaches are most effective for providing evidence of students' understanding and ability to use the CCCs."
- **Expected Student Performance specific to the cross cutting concepts (k-5)** The model lessons found **here** were created across districts and states utilizing local phenomenon through collaboration with Brett D. Moulding, Rodger W. Bybee, and Nicole Paulson, authors of A Vision and Plan for Science Teaching and Learning. Instructional models used in this site are used with permission from the authors.
- **Expected Student Performance specific to the cross cutting concepts (6-12)** The model lessons found **here** were created across districts and states utilizing local phenomenon through collaboration with Brett D. Moulding, Rodger W. Bybee, and Nicole Paulson, authors of A Vision and Plan for Science Teaching and Learning. Instructional models used in this site are used with permission from the authors.

Classroom resources

- **Crosscutting Concepts Graphic Organizers:**
- **K-5 Crosscutting concepts table tents**
- **Prompts for Integrating Crosscutting Concepts Into Assessment and Instruction** Stem Teaching Tool #41: This set of prompts is intended to help teachers elicit student understanding of crosscutting concepts in the context of investigating phenomena or solving problems.

SEP Resource Guide

- **Assessing three-dimensional performance: science and engineering practices-**This resource describes how science and engineering practices (SEPs) can be used in science assessments and tasks. This resource identifies common misconceptions around the use of SEPs in assessments, while also providing effective and meaningful ways assessment tasks can elicit evidence of students' engagement in SEPs. (Achieve: Task Annotation Project in Science (TAPS))
- **STEM Teaching Tool 30 Task Formats for 3D Assessment:**The "task format" templates included in this document are tools to help teachers and district leaders design three-dimensional assessment tasks.
- **Engaging English Learners in the Science and Engineering Practices STEM Teaching Tool #27**
- **Understanding how teachers guide evidence construction conversations** by Eve Manz Ian Parker Renga
- **Expected Student Performance specific to the practices (k-5)** The model lessons found **here** were created across districts and states utilizing local phenomenon through collaboration with Brett D. Moulding, Rodger W. Bybee, and Nicole Paulson, authors of A Vision and Plan for Science Teaching and Learning. Instructional models used in this site are used with permission from the authors.
- **Expected Student Performance specific to the practices (6-12)** The model lessons found **here** were created across districts and states utilizing local phenomenon through collaboration with Brett D. Moulding, Rodger W. Bybee, and Nicole Paulson, authors of A Vision and Plan for Science Teaching and Learning. Instructional models used in this site are used with permission from the authors.

DCI:

- **12 Core Ideas by Cary Sneider:** This article explains how the Core Ideas were chosen

Driving Question Boards: and written by a writer of the NGSS.

- **Video** describing DQB

NGSS Teaching Strategies

Incorporating Scientific Argumentation into Your Classroom

- **Setting up science notebooks**
- **ACCESSE:** The Advancing Coherent and Equitable Systems of Science Education (ACESSE, or "access") project brings together partners from educational research and practice to improve equity by building coherence in science education. The project is based on a deep collaboration between the University of Colorado Boulder, the Council of State Science Supervisors, and the University of Washington.
- Evaluating Instructional Materials with **EQuiP**

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- #SeismogramSaturday
- #assessNGSS
- #NGSSchat
- #DENGSS