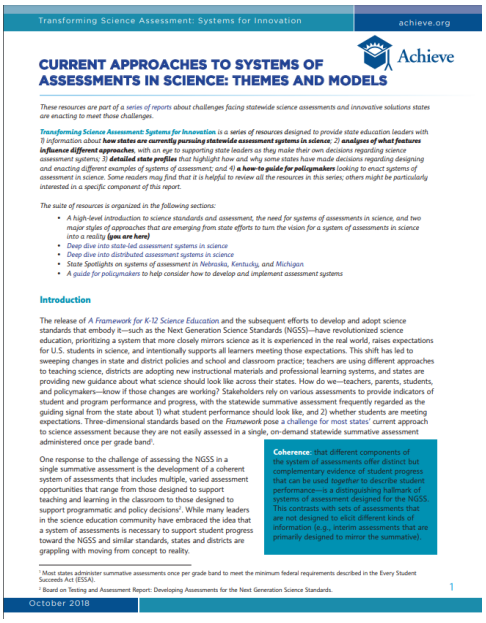
NGSS NOW

5 things to know about quality K-12 science education in **October 2018**

1 New Set of Tools and Resources - *Transforming Science Assessment: Systems for Innovation*

Achieve is excited to launch a new suite of seven resources on transforming science assessment for new three-dimensional standards, such as the NGSS. *Transforming Science Assessment: Systems for Innovation* is designed to provide state education leaders with:

- Information about how states are currently pursuing statewide assessment systems in science;
- Analysis of the features that influence different approaches to science assessment systems;
- Detailed state profiles that highlight how and why some states have made certain decisions about their systems of assessment; and
- A practical guide for policymakers looking to enact systems of assessment in science.


Transforming Science Assessment: Systems for Innovation achieve.org

Achieve

CURRENT APPROACHES TO SYSTEMS OF ASSESSMENTS IN SCIENCE: THEMES AND MODELS

These resources are part of a series of reports about challenges facing statewide science assessments and innovative solutions states are enacting to meet those challenges.

Transforming Science Assessment: Systems for Innovation *is a series of resources designed to provide state education leaders with 1) information about* ***how states are currently pursuing statewide assessment systems in science****; 2)* ***analyses of what features influence different approaches****, with an eye to supporting state leaders as they make their own decisions regarding science assessment systems; 3)* ***detailed state profiles*** *that highlight how and why some states have made decisions regarding designing and enacting different examples of systems of assessment; and 4)* ***a how-to guide for policymakers*** *looking to enact systems of assessment in science. Some readers may find that it is helpful to review all the resources in this series; others might be particularly interested in a specific component of this report.*

The suite of resources is organized in the following sections:

- *A high-level introduction to science standards and assessment, the need for systems of assessments in science, and two major styles of approaches that are emerging from state efforts to turn the vision for a system of assessments in science into a reality* ***(you are here)***
- *Deep dive into state-led assessment systems in science*
- *Deep dive into distributed assessment systems in science*
- *State Spotlights on systems of assessment in Nebraska, Kentucky, and Michigan*
- *A guide for policymakers to help consider how to develop and implement assessment systems*

Introduction

The release of *A Framework for K-12 Science Education* and the subsequent efforts to develop and adopt science standards that embody it—such as the Next Generation Science Standards (NGSS)—have revolutionized science education, prioritizing a system that more closely mirrors science as it is experienced in the real world, raises expectations for U.S. students in science, and intentionally supports all learners meeting those expectations. This shift has led to sweeping changes in state and district policies and school and classroom practice; teachers are using different approaches to teaching science, districts are adopting new instructional materials and professional learning systems, and states are providing new guidance about what science should look like across their states. How do we—teachers, parents, students, and policymakers—know if those changes are working? Stakeholders rely on various assessments to provide indicators of student and program performance and progress, with the statewide summative assessment frequently regarded as the guiding signal from the state about 1) what student performance should look like, and 2) whether students are meeting expectations. Three-dimensional standards based on the *Framework* pose a challenge for most states' current approach to science assessment because they are not easily assessed in a single, on-demand statewide summative assessment administered once per grade band[1].

One response to the challenge of assessing the NGSS in a single summative assessment is the development of a coherent system of assessments that includes multiple, varied assessment opportunities that range from those designed to support teaching and learning in the classroom to those designed to support programmatic and policy decisions[2]. While many leaders in the science education community have embraced the idea that a system of assessments is necessary to support student progress toward the NGSS and similar standards, states and districts are grappling with moving from concept to reality.

Coherence: that different components of the system of assessments offer distinct but complementary evidence of student progress that can be used together to describe student performance—is a distinguishing hallmark of systems of assessment designed for the NGSS. This contrasts with sets of assessments that are not designed to elicit different kinds of information (e.g., interim assessments that are primarily designed to mirror the summative).

[1] Most states administer summative assessments once per grade band to meet the minimum federal requirements described in the Every Student Succeeds Act (ESSA).
[2] Board on Testing and Assessment Report: Developing Assessments for the Next Generation Science Standards.

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Check out the full suite of resources - along with other resources about science assessment - here. To learn more about how Achieve can support your state or district's efforts to design and implement high-quality systems of assessment in science, please contact ngss@achieve.org.

2 Tools for Evaluating Classroom Assessment Tasks


Science Task Screener

Knowing whether your classroom assessment tasks are hitting the mark is not easy. To help educators get a better grasp on how to do this well, last month Achieve released two new tools designed to assist educators in evaluating three-dimensional classroom assessment tasks. The Science Task Prescreen can be used to conduct a quick review of assessment tasks to identify any "red flags" and determine whether a task is worth a more rigorous evaluation. The Science Task Screener is used to take a deeper dive into evaluating assessment tasks, and is organized around four key criteria that evaluators should use to rate and improve a task.

3 New High-Quality High School Unit Example: How Does a Small Spark Trigger a Huge Explosion?

The Science Peer Review Panel has rated another unit as high quality and posted it online. This is the second unit in the Interactions curriculum by Michigan State University's CREATE for STEM Institute and the Concord Consortium to be identified as high quality (see the first unit here). In this unit, students further develop their model of electrostatic interactions by incorporating the relationship between electric potential energy and electric forces. In particular, the unit focuses on the electrostatic attractions and energy conversions involved in the formation of molecules (chemical reactions). See the unit here, and the full EQuIP Rubric review here.

4 Selecting Anchoring Phenomena for Equitable Teaching

In September, Advancing Coherent and Equitable Systems of Science Education (ACESSE) published two workshops to support the process of selecting phenomena that can anchor units of instruction or be used in a scenario as part of a three-dimensional assessment. This resource can also be used by individuals wanting to refine their teaching practice around phenomena-based instruction. Specifically, these workshops can help participants:

- Explain to a peer the role of phenomena and design challenges in science teaching, with a particular focus on equity and justice
- Generate working definitions of phenomena, design challenges, and disciplinary core ideas
- Identify phenomena related to a bundle of three-dimensional standards
- Experience how phenomena can be introduced at the start of a unit in order to launch a student-driven series of questions

5 Webinar: Retaining STEM Teachers

AARISE (Advancing Research & Innovation in the STEM Education of Preservice Teachers in High-Need School Districts) and AAAS recently offered a webinar that discussed how teacher preparation programs can influence the factors that cause a high

turnover rate of STEM teachers in high-need school districts. Specifically, the webinar allowed participants to: develop a deeper understanding of the importance of studying STEM teacher retention; increase familiarity with what we know and gaps in our knowledge of STEM teacher retention that need to be further explored; recognize the relevance of research on STEM teacher retention to their role; and identify actions to improve their own practice. The recording will be posted here.

NEXT GENERATION SCIENCE STANDARDS
For States, By States