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Recognizing and Selecting Instructional Materials for the NGSS Era

How can you recognize quality instructional materials?

Research on instructional materials has identified a number of features associated with quality support for teacher implementation and student learning. Quality materials:

- **Are designed to meet the needs of diverse students in order to provide access and equity for all.** Today's classrooms include diverse student populations that vary in ability, preparation, motivation, native language, culture, and home environment. Instructional activities in the materials should build on students' backgrounds, as well as support students with rigorous goals and inclusive instructional strategies and approaches.
- **Use interesting phenomena and problems or issues to drive instruction and spark students' interest.** Phenomena are central to science and engineering, and they help to engage and motivate students. Phenomena and problems drive instruction by anchoring learning as students build scientific and engineering knowledge to explain phenomena, design solutions, or solve problems.
- **Present a coherent storyline.** The storyline should describe the context and rationale for the sequence of learning experiences and how they build student learning toward specific Performance Expectations.
- **Provide a variety of engaging and challenging activities.** These activities should reflect the variety of concepts, ideas, and processes in science. They should support diverse students to build their ability to engage in three-dimensional learning.
- **Seamlessly integrate the three dimensions of the NGSS.** Each activity should integrate appropriate SEP, CCC, and DCI to support students in making sense of scientific phenomena or solving engineering problems.
- **Include educative elements that support teacher implementation and professional learning.** Educative elements promote teachers' growth over time in their ability to engage students with scientific and engineering concepts and processes. These elements go beyond day-to-day instruction by supporting teachers to respond to students' needs and adapt their instruction to take full advantage of learning opportunities in the materials.

- **Are based on a clearly articulated instructional model or learning cycle.** The model should be grounded in research on how students learn and should incorporate formative assessment opportunities while guiding students to deeper knowledge and mastery of scientific and engineering practices. The use of an effective instructional model helps to create consistency in the delivery of curriculum, and therefore is an important part of addressing equity issues in the classroom.
- **Include formative assessment opportunities.** Formative assessments support teachers and students as they monitor students' progress. They should also help teachers to adjust and modify their instruction to address gaps in student understanding.
- **Integrate the Common Core State Standards identified in the NGSS.** Scientific literacy requires the ability to read scientific literature, communicate ideas, engage in argument, and apply mathematical and computational reasoning. The NGSS identify salient connections to the Common Core State Standards.

How do we recommend that schools select science instructional materials?

There is more than one right way to go about selecting science instructional materials, but following is a suggested approach.

- Establish a vision for science education in your district.** The vision might include the types of learning experiences you want for all your students, the role of science in preparing your students for college and careers, the relationship of science to other subjects, and your expectation for how many hours of science will be taught each week.
- Conduct initial vetting of materials.** If you are in a state where there is not an adoption process or a recommended list of instructional materials to choose from, you will need to conduct a technical review of the materials to make sure that they address your science standards or rely on a reputable third-party agency to do this.
- Select candidate programs to review that you think will meet your vision.** Approach publishers of materials for review copies.
- Select a subset of those materials to actually try out (or “test drive”) in classrooms.** Ideally, teachers would have an opportunity to present at least one complete unit. Establish a method for capturing teacher and student reactions to the experiences. Have teachers share those reactions and examples of student work that result with each other and with district administrators.
- Select one program to purchase and implement.** Work with the publisher and/or developer of the materials to create an implementation plan.