

4 “Look-Fors” That Signal Quality Science Instruction

A principal’s guide to NGSS in the middle school classroom

By Sheri Prendergast

With the introduction of the Next Generation Science Standards (NGSS) in science classrooms across the country, many administrators are asking, *What does quality NGSS-aligned science instruction look like?*

One of the first steps in the development of the NGSS was the creation of a Framework for K–12 Science Education. This framework, developed in 2012 by the National Research Council (NRC) of the National Academy of Sciences, serves as a foundation for NGSS. It is based on current research about how students best learn science.

The NGSS standards are intended to help students develop problem-solving skills and an in-depth understanding of science content that will serve students in their educational and professional lives by making them scientifically literate. But how does NGSS accomplish this? Educators use storylines.

The Role of Storylines in NGSS

A storyline is a sequence of related lessons in which each step is driven by students’ questions that arise from their interactions with phenomena; the storyline is introduced in a first lesson. At each step, students should ask questions, develop explanations, make models, and design solutions that align to the anchoring phenomena that they are exploring. A storyline helps students build their knowledge of a disciplinary core idea (DCI) and make connections with crosscutting concepts (CCCs) while using science and engineering practices (SEPs) to help them understand the reason



for a phenomenon in the world around them.

The 4 “Look-Fors” That Signal Quality NGSS Instruction

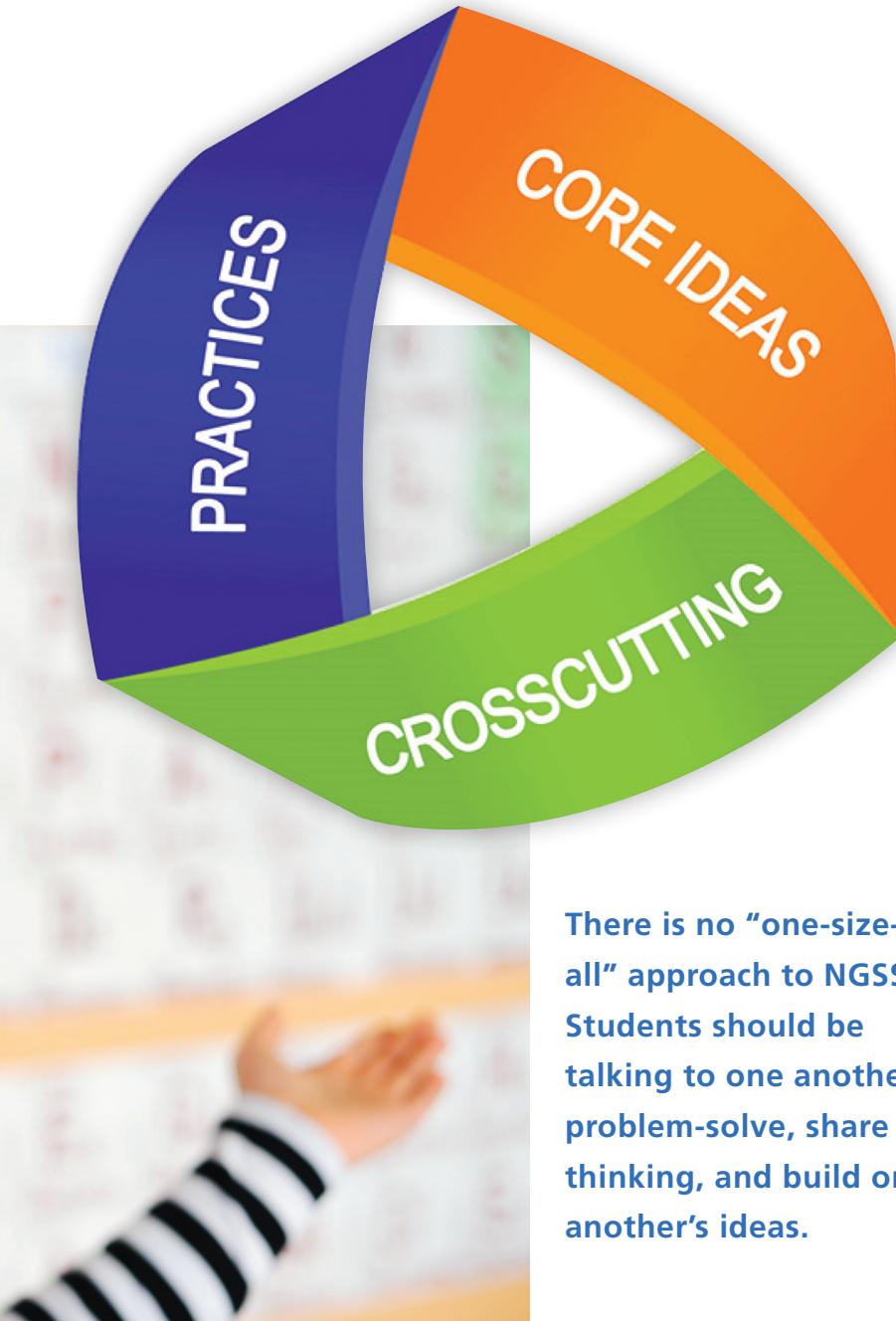
There is no “one-size-fits-all” approach to NGSS. Daily, students should be questioning, talking, and exploring scientific phenomena.

What does that look like in a middle school science classroom? These

four “look-fors” are evidence of robust science education in action:

1. Students are engaged in investigating an overarching phenomenon that is constantly referenced throughout the unit.

In an NGSS classroom, students will often be asked to complete an *I notice, I wonder* chart when they begin their exploration or partake



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in a learning activity in which they need to question what they observe. This activity allows students to explore their current knowledge and develop critical questioning skills about the world around them.

As students progress throughout a unit, students may be asked to complete a summary table, which tracks their learning throughout the unit. Students

look to the table to identify how their thinking has changed throughout their experiences.

2. Students are talking to one another ... constantly.

Students should be talking to one another to problem-solve, share their thinking, and build on one another’s ideas. For this to occur, students need to be taught how to

have these discussions. Some sample questions that may be posed or sentence stems that are provided could include, *How did you reach your conclusion? I agree with you, but could you clarify ...?*

3. Students are drafting models of their thinking.

A model in an NGSS-aligned class is a picture or diagram that represents what students are thinking. Students should be challenged to create a first-draft model prior to their learning, continually revisit it, and revise the model based on the learning activities they experience.

4. Students are using evidence from their learning to support their ideas.

NGSS requires students to understand scientific concepts and explain them in words that make sense to them. Gone are the days of memorizing 25 words for a multiple-choice exam. Students need to be able to explain their understanding in writing by creating solutions to problems that they experience, using the evidence that they’ve learned throughout the unit.

The Next Generation Science Standards aim to help students develop a big-picture understanding of science concepts. Gone are the days of the “sage on the stage.” Today, teachers should act as facilitators who encourage students to think and discuss. □

Sheri Prendergast is an assistant principal at Broadview Middle School in the Danbury Public Schools (Connecticut).