

To make the shifts that today’s science standards demand, educators and students need access to **high-quality instructional materials**.



Updating old curricular materials to ensure they align to framework-based standards is challenging. The most effective and tightly aligned materials are built from the ground up, and materials developers are making progress.

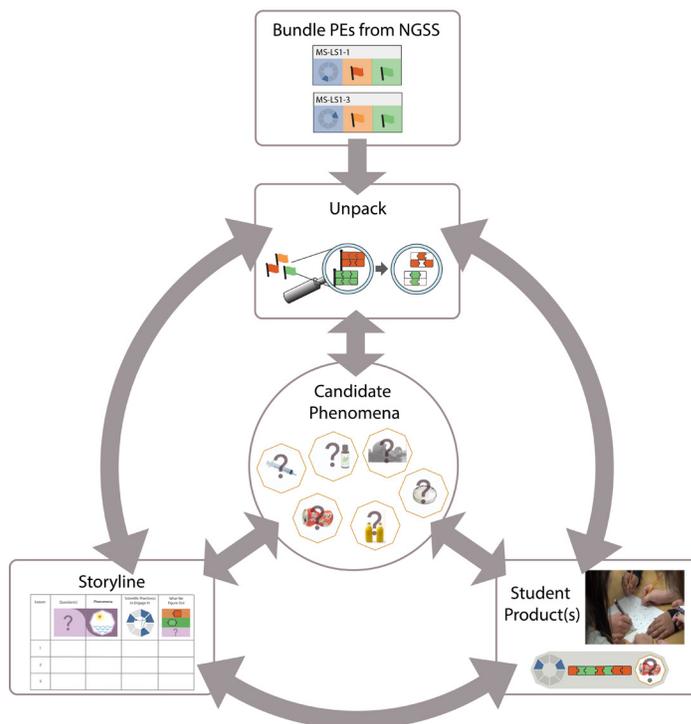
“WE ALREADY HAVE A UNIT ON THIS TOPIC. CAN’T WE JUST REPURPOSE THOSE MATERIALS FOR THE NGSS?”

As educators work to transition to the NGSS, they will need curriculum materials to support the new vision of science education. Some educators will create new materials designed for the NGSS while others will try to adapt existing materials to align them more closely to the NGSS. Tara McGill, a member of the leadership team at NextGen Science Storylines in Illinois, has tried both approaches and found that one was more successful than the other.

Soon after the NGSS were released, McGill began providing educators with guidance and professional learning about how to adapt materials to ensure they align with the new science standards. She and her team conducted workshops to evaluate materials and determine which steps could be added to existing lessons and activities to support students in reaching the NGSS vision.

School districts had expected that the process to develop instructional materials would be easy and fast, that materials would simply need to be adjusted for grade level and include additional instructional components. However, building coherent instructional materials that met the vision of the NGSS proved to be extremely difficult and very time-consuming.

Overview of the Storyline Process



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Reiser, B. J. (2014). *Designing coherent storylines aligned with NGSS for the K-12 classroom*. National Science Education Leadership Association, Boston, MA.
Reiser, B. J., Novak, M., & Fumagalli, M. (2015). *NGSS storylines: How to construct coherent instruction sequences driven by phenomena and motivated by student questions*. Illinois Science Education Conference 2015, Tinley Park, IL.

Curriculum writers following the NextGen Science Storylines process begin with clear goals in mind and an instructional framework that prioritizes student sense-making and problem solving.



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For example, even after McGill and her team added components such as opportunities for students to ask questions, student questions weren’t driving the sequence of lessons. A driving phenomenon could be added in Lesson 1, but very often the materials would still prompt the teacher to explain the phenomenon in Lesson 2. Students were given more opportunities to plan investigations, but the investigations themselves were still used to confirm science ideas rather than gather data that would help students build science ideas themselves.

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McGill’s guidance on adapting materials for the NGSS doesn’t preclude reusing previous materials. There are ways to repurpose the great work that has engaged students over the years, such as an authentic context or laboratory investigation, or great teacher facilitation notes for class discussions.

However, typically, adding missing pieces is not sufficient to ensure materials are designed for the NGSS. McGill views this as similar to working with Legos — building blocks from one structure can be deconstructed and made into something completely different.

McGill offers the following advice for people redesigning their materials for the NGSS: “Start with carefully unpacking the target disciplinary core ideas and crosscutting concepts and practices and thinking about the final place you want kids to go. Look through the existing materials and find any resources that will help you get to that final place.” The key is to keep a clear vision of the end result at the forefront of the development process, such as what authentically engaging phenomenon students should be able to explain or what problem students should be able to solve.

McGill and her team of expert curriculum developers at **NextGen Science Storylines** now have produced several units that have earned **NGSS Design badges**. “Having an anchoring phenomenon or problem is a game changer, as is allowing students to try to make sense of the phenomena right away before any instruction,” McGill said. “Before, we wanted all students to be on the same page and to get the right answer. It is scary if there are a lot of different ideas in the classroom. Now, we value a diversity of ideas and use evidence to work together over time to build ideas.”

Learn more about the NextGen Science Storylines project here: <https://www.nextgenstorylines.org/>

About NextGenScience

NextGenScience, a project at WestEd, works alongside educators to transform science teaching, learning, and leadership through equitable and evidence-based approaches to reviewing classroom instructional materials, fostering meaningful partnerships, and developing system strategies for coherent science programs. Learn more about our work: ngs.wested.org.