Climbing the *NGSS* Mountain

Persistence and a sense of purpose can propel you to the top

Tricia Shelton

My high school students rushed (yes, rushed) into class eager to "figure out" a phenomenon in the news—the death of a vibrant young high school football player in Georgia who died from drinking too much water. That snapshot moment represents what my students and I have become: a *Next Generation Science Standards* classroom. My students engage in three-dimensional learning, using science and engineering practices (SEPs), crosscutting concepts (CCs) and disciplinary core ideas (DCIs) to build an understanding of the world.

Getting here wasn't easy. The magic lies in a phenomenon-based storyline that piques student curiosity so that they will overcome challenges to figure out a phenomenon because they just *have* to know.

The journey

Engaging the vision of the *NGSS* (NGSS Lead States 2013) is like climbing a mountain: daunting yet transformational, resulting in capacity building, changing perspectives, and understanding built from connecting knowledge to experience. As with mountaineering, chances of success increase with a guide and a team. This article traces my path from novice toward expert as I partnered with my students, with help from my professional network, to create an *NGSS* classroom.

To understand the background and the vision of the *NGSS,* I started my path by reading *A Framework for K–12 Science Education* (NRC 2012), reflecting current research about how students best learn science. The *Framework,* on which the *NGSS* were based, changed my perspective about how instruction should be designed in my classroom. From that moment on, the units in the Shelton class would be grounded in these core principles:

1. Students must be working to explain a phenomenon or solve a problem.
2. Students build understanding over time as they are engaged in three-dimensional learning.
3. Students' need to engage in three-dimensional learning to explain phenomena drives classroom instruction and creates coherent storylines.

Eager to translate these principles into practice, I first explored resources and tools for creating *NGSS*-aligned instruction. Resources at the NGSS@NSTA Hub as well as the EQuIP rubric (see "Resources") were a big help. The most important element was an approach toward *NGSS* action research in the classroom. Students and I developed a collaborative culture that combines an intellectual task with an emotional bond; both head and heart engage in a common purpose.

We found joy in the partnership. The learning and the celebration of those lightbulb moments when we knew we made a big discovery fueled our desire to continue our journey up the mountain. We welcomed the challenge because we were experiencing the best way to learn: a focus on figuring out together that was hands-on and minds-on in the context of a storyline. Together, we experienced empowerment from doing something meaningful that required significant effort.

The team

Our classroom successes directly relate to three elements: a guide that gives us direction (the *Framework, NGSS,* and related resources); partners (my students) who are willing to persist; and my professional learning network, who give me perspective. Our focus on the *NGSS* has given us a common language and shared vision as we become part of something bigger than classroom walls can contain.

The *NGSS* lends itself to global conversations and collaborations, while 21st-century technology and connectivity help educators form teams to figure out the *NGSS* together. Through social media and virtual communities, I connected with other teachers and classrooms focused on figuring out the same thing: How to use the latest research to transform the science learning experience—in and out of the classroom—to prepare students for the next step. Learning from each other's practice builds a collective knowledge that moves everyone toward the summit of the mountain.

The path

We are preparing students for a world that shifts at an ever-accelerating pace. The vision of the *NGSS* and the *Framework* supports teachers in empowering students with the knowledge and skills necessary to benefit them as individuals as well as to meet society's needs in a changing world. Even

though we share a common vision—becoming *Next Generation Science Standards* classrooms—the journey up the mountain is personal. There are many ways to reach the peak of the mountain and many transformations that teach us. Even if we are not in an *NGSS* adoption state, the research clearly shows why we should begin the journey. *We should do this. We can do this.* Carve out your classroom's path up the mountain. Find your team of support. Along the way, share your journey to benefit the thinking of others and collectively work toward figuring out the *NGSS*. ■

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References

National Research Council (NRC). 2012. *A framework for K–12 science education: Practices, crosscutting concepts, and core ideas.* Washington, DC: National Academies Press

NGSS Lead States. 2013. *Next Generation Science Standards: For states, by states.* Washington, DC: National Academies Press.

Resources

Learning about and translating the *NGSS* into instruction

A Framework for K–12 Science Education: Practices, Crosscutting concepts, and Core Ideas: http://bit.ly/17ZdLrc

The Next Generation Science Standards: www.nextgenscience.org

NGSS@NSTA Hub: *http://ngss.nsta.org/*

NGSS EQuIP Rubric: *http://bit.ly/1L2t0zw*

NGSS for All Students by L. Okhee Lee, E. Miller, and R. Januszyk. Arlington, VA: NSTA Press. *http://bit.ly/1ha2Qij*

***NGSS* professional learning**

Discover the NGSS e-book: *www.nsta.org/publications/press/ebooks.aspx*

Introducing Teachers and Administrators to the NGSS: A Professional Developer's Facilitation Guide by E. Brunsell, D.M. Kneser, and K.J. Niemi. Arlington, VA: NSTA Press. *http://bit.ly/1FHR5eq*

NGSS Teaching Channel videos: *www.teachingchannel.org/videos/next-generation-science-standards-achieve*

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