What Are the Next Generation Science Standards?

The Next Generation Science Standards (NGSS) are a new set of science standards for kindergarten through high school. The NGSS were designed with the idea that students should have a science education that they can use in their lives. It should empower students to be able to make sense of the world around them. And it should give students the critical thinking, problem solving, and data analysis and interpretation skills they can use in any career, and that will help them make decisions that affect themselves, their families, and their communities. Many states have adopted the NGSS or very similar standards.

In order to accomplish this, the NGSS call for science learning in which students do not just memorize a set of science facts, but rather engage in figuring out how and why things happen. Core ideas in life science, Earth science, physical science, and engineering are intentionally arranged from kindergarten through twelfth grade so that students can build their understanding over time, and see the connections between different ideas and across disciplines. To figure out these core ideas, students engage in the same practices that real scientists and engineers do. For example, students develop and use models, analyze data, and make evidence-based arguments. They also learn to make sense of core ideas using crosscutting concepts, such as systems or cause and effect, which are useful ways of thinking about and making connections across different areas of science and engineering. The NGSS website provides additional information and resources for families.

The NGSS call for these three dimensions—core ideas, practices, and crosscutting concepts—to work together in science classes. For example, students could build models (a science practice) to show what they understand about animal defenses (a core science idea) and the structure and function of the body parts involved (a crosscutting concept). In each Amplify Science unit, students figure out a real-world problem by assuming the role of a scientist or engineer. Students engage in the three dimensions of the NGSS as they build their understanding of concepts and skills, which they can use in their lives.
Three-Dimensional Learning in the Amplify Science First-Grade Course

The Amplify Science Grade 1 Course includes three units that support students in meeting the NGSS. The following unit summaries demonstrate how students engage in three-dimensional learning to solve real-world questions and problems.

Animal and Plant Defenses: Spikes, Shells, and Camouflage. Students advise an aquarium director by helping answer young visitors’ questions about Spruce the Sea Turtle, who will soon be released back into the ocean. They investigate how Spruce and her offspring can survive in the ocean, particularly since sharks live in the area. Students obtain information from videos and science books about how plants and animals survive and about parents and offspring. Students make physical models and write explanations to show what they learn about the structure and function of animal defenses.

Light and Sound: Puppet-Theater Engineers. Students act as light and sound engineers to design and create a scene for a puppet show. Students ask questions and work to define the design problems they are asked to solve. They figure out cause-and-effect patterns related to light, shadows, and sound by conducting hands-on investigations and reading science books. They use both firsthand evidence and evidence from books to support their ideas.

Spinning Earth: Investigating Patterns in the Sky. In the role of sky scientists, students work to understand why the sky looks different to a young boy and to his grandma when they talk on the phone in the evening. Students plan and conduct investigations and find patterns in data to figure out what causes nighttime and daytime, and the changing position of the sun in the sky. Thinking in terms of systems helps students make sense of the Earth/sun system.