

# Information About the NGSS for Parents and Guardians of Kindergartners

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## 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 consider cause-and-effect relationships (a crosscutting concept) as they design and test solutions (an engineering practice) that use forces to change a pinball's motion (core science ideas). 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 Kindergarten Course

The Amplify Science Kindergarten 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.

**Needs of Plants and Animals: Milkweed and Monarchs.** Students help a group of children figure out why there are no more monarch caterpillars in a community garden and how to bring them back. Students conduct hands-on investigations to figure out what plants need in order to live and thrive. They ask questions and learn about the system of plants and animals that live together in a habitat. They figure out patterns in the life cycles of living things by reading and analyzing photographs.

**Pushes and Pulls: Designing a Pinball Machine.** Students take on the role of pinball machine engineers as they explore the effects of forces on the motion of an object. They consider cause and effect and structure and function as they design and build their own pinball machines. They analyze data from their tests using mathematical thinking. Students also gather evidence of forces at work in their school.

**Sunlight and Weather: Solving Playground Problems.** Students work to solve the problem of why students at one fictional school are too cold during morning recess while students at another school are too hot during afternoon recess. They develop and use models to gather evidence about the effect of sunlight (energy) on Earth's surface (matter) and how flooding during wet weather can be avoided. They gather local weather data and use concepts of scale, proportion, and quantity to make sense of it.