

# Information About the NGSS for Parents and Guardians of Second Graders

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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 conduct investigations (a science practice) about how plants spread their seeds (a core science idea) while thinking about a habitat as a system of interacting parts (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 Second-Grade Course

The Amplify Science Grade 2 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.

**Plant and Animal Relationships: Investigating Systems in a Bengali Forest.** What is the connection between chalta fruit, elephants, and droppings? Students find out as they investigate an authentic mystery that occurred in a broadleaf forest habitat in northeastern India. They plan and conduct investigations to figure out what plants need to grow and ways that many plants rely on animals to disperse their seeds. Students use mathematical thinking and concepts of proportion and quantity to make sense of their measurements and other data. They construct scientific explanations about how the parts of the Bengali forest work together as a system.

**Properties of Materials: Designing Glue.** Students take on the role of glue engineers and design and test a glue for use at their school. They figure out cause-and-effect relationships related to heating and cooling materials, and find patterns in the properties of substances and mixtures. Students make arguments about effective glue recipes using the evidence they have gathered from investigations and science texts.

**Changing Landforms: The Disappearing Cliff.** Students act as geologists helping a recreation center director understand what is happening to a nearby cliff, which appears to have changed. They ask questions about landforms, water, and wind, and use hands-on models to figure out how small-scale changes to landforms can add up to large-scale changes over long periods of time. As they obtain information about erosion, they figure out how rock that appears stable in the short-term can actually change a lot over time. They create diagrams to communicate their findings.