

Preparing Students for a Lifetime of Success

Understanding New
Science Standards
for Grades K-2

How will we prepare students for academic success?

Many states have adopted new standards based on the Next Generation Science Standards (NGSS) because they understand that a robust science education in elementary school will pave the way for increased opportunities in middle school, high school, and college.

The NGSS enable teachers to offer all students interactive science instruction that promotes analysis and interpretation of data, critical thinking, problem solving, and connections across science disciplines—with a high set of expectations for achievement in grades K-2.

A quality science education can help expand opportunities for all students.

The science standards complement English/Language Arts and mathematics standards, enabling classroom instruction to reflect a clearer picture of the real world, where solving problems often requires skills and knowledge from multiple disciplines. Further, these standards are designed to provide an equitable, high-quality science education to all students.



What is our vision for science education?

The NGSS reflect the latest research and advances in modern science. In order to equip students to think critically, analyze information, and solve complex problems, the standards are arranged such that—from elementary through high school—students have multiple opportunities to build on the knowledge and skills gained during each grade, by revisiting important concepts and expanding their understanding of connections across scientific domains. Parents should understand that while some content might be similar to the past, it may look different from how they were taught.

As the science standards are implemented in schools and districts, they will enable students to:

- Develop a deeper understanding of science beyond memorizing facts, and
- Experience similar scientific and engineering practices as those used by professionals in the field.

How will students learn science in the classroom?

Each year, students should be able to demonstrate greater capacity for connecting knowledge across, and between, the physical sciences, life sciences, earth and space sciences, and engineering design.

During grades K-2, your child will begin to form connections between concepts and skills such as understanding relationships between objects, planning and carrying out investigations, and constructing explanations.

Upon completion of grades K-2, your child should have a deeper understanding of:

- Motion and properties of matter;
- Relationship between sound and vibrating materials;
- Factors that impact what plants and animals need to survive; and
- How objects can be changed or improved through engineering.

Physical Sciences

Physical sciences during grades K-2 may explore questions including:

- How does pushing or pulling an object change the speed or direction of its motion?
- How do objects change motion when they touch or collide?
- What are some effects of sunlight on earth's surface?

Life Sciences

Life Sciences during grades K-2 may explore questions including:

- What do plants and animals need to live and grow?
- How does the insect survive the winter if the plant is dead?
- How are parents and their children similar and different?

Earth and Space Sciences

Earth and space sciences during grades K-2 may explore questions including:

- What are the different kinds of lands and bodies of water?
- Why is it usually cooler in the mornings than in the afternoons?
- What objects are in the sky and how do they seem to move?

Engineering Design

Engineering design during grades K-2 may explore questions including:

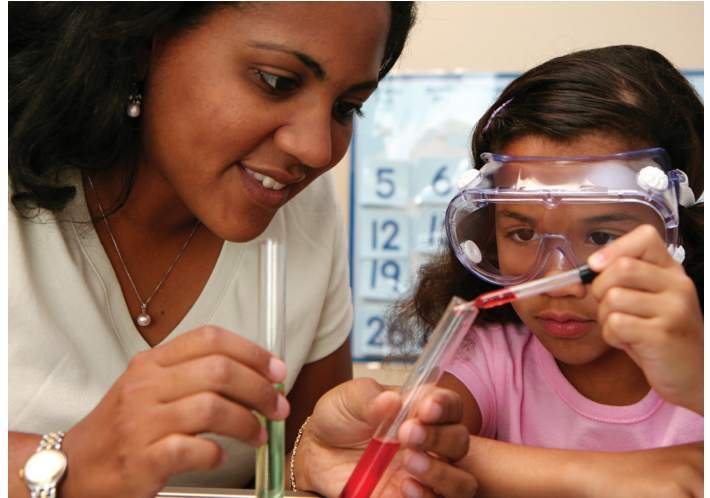
- What is a local example of engineering design?
- What materials were used to construct the project?
- What kinds of problems can be solved through engineering?

Classroom activities in Elementary School will look less like this:	And look more like this:
Students have infrequent exposure to science instruction or related activities.	Students engage with science concepts as a core part of instruction and are encouraged to connect lessons to their own personal experiences.
Students memorize the general structure and properties of matter.	Students use water and butter to investigate how some changes caused by heating or cooling can be reversed while others cannot.
Students examine insects or bugs on the playground or during special events such as science fairs.	Students observe the life cycles of beetles, butterflies, and pea plants to identify patterns that are common to all living things.
Students draw static pictures of the sun to demonstrate where it is at different times of the day.	Students support claims about the movement of the sun by identifying an outdoor object that receives direct sunlight, then tracing an outline of its shadow at three different times during the day.
Students have infrequent exposure to discussions or activities related to engineering design.	Students consider or apply engineering design principles throughout each grade level.
Student discussions and activities are disconnected from mathematics or English/Language Arts instruction.	Student discussions and activities are thoughtfully integrated with mathematics and English/Language Arts instruction.

About NGSS: Reshaping Science Education for All Students

To better prepare American students for college and careers, schools need to ensure that quality science education is accessible to all students—regardless of ethnicity or zip code.

In an effort to bolster America’s competitive edge in an increasingly global economy, 26 states led the development of the Next Generation Science Standards (NGSS) by working with teachers, higher education, business, and practicing scientists. This collaborative process produced a set of high quality, college- and career-ready K-12 academic standards that set meaningful expectations for student performance and achievement in science. The NGSS are rich in both content and practice and arranged in a coherent manner across all disciplines and grades.



Fact: “Standards” are not “curriculum”. “Standards” provide clarity about *what students should know and be able to do by the end of each grade level*. “Curriculum” refers to *how students meet those expectations*. Please contact your child’s teacher or school if you have questions about their curriculum.

Three Dimensions of Science Learning

The NGSS emphasizes three distinct, yet equally important dimensions that help students learn science. Each dimension is integrated into the NGSS and—combined—the three dimensions build a powerful foundation to help students build a cohesive understanding of science over time.

