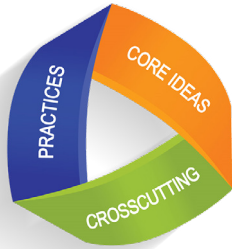


THE THREE DIMENSIONS OF THE CA NGSS



Dimension 1: Science and Engineering Practices (SEPs)

What scientists and engineers **do**. SEPs are skills and behaviors they use to answer a question or solve a problem.

Dimension 2: Disciplinary Core Ideas

What scientists and engineers **know**. These fundamental ideas are organized into four disciplines: life science; physical science; Earth and space science; and engineering, technology, and applications of science.

Dimension 3: Crosscutting Concepts

How scientists and engineers **think**. Understanding these common threads that tie together the four disciplines of science helps students deepen their understanding of core ideas and allows them to implement the practices more effectively.

Combining the Three Dimensions

The CA NGSS define performance expectations (PEs) about what students should know and be able to demonstrate by the end of the school year. These PEs require students to use all three of the dimensions together.

To help your student learn science:

- ▶ Talk with your student about the science you use and encounter every day.
- ▶ Observe plants and animals near your home, and ask how they are alike.
- ▶ Visit museums and hands-on science centers, plant a garden, and observe phenomena in your community. Participate in a creek, trail, or beach cleanup. Recycle at home and support your local electronic waste recycling.
- ▶ Talk with the teacher about the different phenomena your child will explore, and ask how you can support your student in engaging in the science and engineering practices at home.

For more information on the CA NGSS and ideas for helping your student succeed, check out these resources:

- ▶ The California Next Generation Science Standards Web page is online at <https://www.cde.ca.gov/pd/ca/sc/ngssstandards.asp>.
- ▶ The 2016 Science Framework for California Public Schools is available online at <https://www.cde.ca.gov/ci/sc/cf/>.
- ▶ The Exploratorium is a hands-on museum in San Francisco. Its Web site at <http://www.exploratorium.edu/explore> includes engaging activities, videos, and links to topics such as Astronomy and Space Exploration, Food and Cooking, and Engineering and Tinkering.

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What Your Student Will Learn: California Next Generation Science Standards

The goal of the California Next Generation Science Standards (CA NGSS) is to prepare California students to be informed citizens and future scientists. Students build science mastery through repeated learning experiences centered around everyday events in nature and their lives (“phenomena”). Focusing instruction around these observable phenomena allows students to understand how their world works and gives them the tools to solve problems they identify in it. Students shift from learning facts about science to actually engaging in the practices of science. *They learn how to be scientists!*

The CA NGSS divide science into four disciplines: life science, Earth and space science, physical science, and engineering. Students investigate phenomena from all four disciplines every year in elementary school.

Engineering, Technology, and Applications to Society

This brochure highlights these embedded engineering connections with an asterisk (*) in the grade level highlights below.

KINDERGARTEN

Life Science

What do plants and animals need to survive? Students discover patterns in their observations about living things and where they live. They collect evidence that living things depend upon and can change their environment. Students communicate ideas about how they can reduce their impact on the planet.*

Earth and Space Science

How does the weather change? Students share observations of their local weather. They learn how weather forecasting helps people prepare for and respond to severe weather.*

Physical Science

What causes objects to move? Students investigate the difference between pushing and pulling an object. They also design a solution to change the motion of an object with a push or pull.*

GRADE 1

Life Science

Why do plants and animals look the way they do? Students make observations of how an organism is similar to its parent but not an exact copy. They design solutions to schoolyard problems by using structures that mimic plant or animal parts.*

Earth and Space Science

What patterns can we observe by watching the Sun, Moon, and stars? Students observe these objects' predictable patterns and analyze the length of daylight at different times of year.

Physical Science

How do sound and light enable us to see and hear? Students plan and conduct experiments to examine vibration, sound, light, and the interaction between light and objects. They determine the effect when they place materials in the path of a beam of light. They also build a device that uses light or sound to communicate over a long distance.*



GRADE 2

Life Science

How do plants survive and thrive? Students conduct investigations to determine what plants need in order to grow, examine seed dispersal and pollination of plants, and make observations of the diversity of life in different habitats.

Earth and Space Science

What shapes can we observe in Earth's natural landscapes? Students obtain information about where water exists on Earth and develop ways to represent the shapes and types of landforms and water features. They design solutions to prevent wind or water from changing the shape of the land.*

Physical Science

Which materials should we use to build different objects? Students test different materials and classify them by their observable properties. They make observations and describe how an object can be broken apart into smaller pieces and reassembled to create a new object.* They examine how materials change when heated or cooled, determining that some changes can be reversed and some cannot.