



# || 4<sup>th</sup> Grade Science Overview

The performance expectations in fourth grade help students formulate answers to questions such as: What is energy and how is it related to motion? How is energy transferred? What happens to energy when things collide? How can we convert energy from one form to another? How do we describe waves? How do we see objects? How can we use patterns to transmit information? How do internal and external structures support the survival, growth, behavior, and reproduction of plants and animals? How do animals use their senses and respond to information? How does matter move through an ecosystem? How has the land changed over time? How can water, ice, wind, and vegetation change the land? What patterns of Earth's features can be determined with the use of maps? How is energy derived from natural resources and how is the environment impacted? How can people protect themselves from the impacts of natural disasters?

**PHYSICAL SCIENCE:** Energy is present whenever there are moving objects, sound, light, or heat. The faster a given object is moving, the more energy it possesses. When objects collide, energy can be transferred from one object to another causing the objects' motions to change. Energy can also be transferred from place to place by electrical currents, heat, sound, or light. Students will use evidence to construct an explanation of relationships between the speed of an object and the energy of that object. Students will investigate energy transfer from place to place by sound, light, heat, and electrical currents and from object to object through collisions. Devices can be designed to convert energy from one form to another. Students will solve a problem by designing, testing, and refining a device that converts one type of energy to another.

Waves are regular patterns of motion that we see in water when the surface of water is touched. Waves can move objects. Light and sound travel as waves. Waves can differ in amplitude and wavelength. Students will model waves and describe wave patterns in terms of amplitude and wavelength and how waves can move objects. Students will develop a model of how the eye uses light to see. Different waves make different patterns. Students will create and compare methods of transferring information through patterns using criteria and constraints.

**LIFE SCIENCE:** Plants and animals have both internal and external structures that serve various functions for growth, survival, behavior, and reproduction. Students will make a claim about how animals use their internal and external structures as part of a system to support the functions of life and defend it with evidence through reasoning. Animals use different sense receptors specialized for particular kinds of information to understand and respond to their environment. Students will use a model to describe the relationships between information that animals sense and animal behaviors. Matter cycles between the air and soil and among plants, animals, and microbes. Organisms



obtain materials required for life from their environments and release waste. Students will develop a model to describe how matter cycles through multiple levels of organisms in an ecosystem.

**EARTH SCIENCE:** Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed. Students will identify and use evidence from rock formations to support an explanation of changes in the landscape over time. Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. Weathering and erosion are examples of interactions between Earth's systems. Students will make observations to provide evidence of weathering and erosion.

The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water areas of Earth. Students will analyze maps to describe patterns in the Earth's features. A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions) that frequently occur in specific areas. Humans cannot eliminate the hazards but can take steps to reduce their impacts. Students will create and compare solutions to reduce the impact of these processes on humans.

Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. Students will investigate energy and fuels and their effects, both positive and negative, on the environment.

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### For Questions Contact

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