

GRADE 4 SCIENCE

The purpose of the fourth grade science curriculum is to actively engage students in scientific learning through inquiry-based activities, hands-on experiments, and multi-media lessons to increase students understanding of scientific concepts.

Life Sciences

Kingdoms of Life

Students will:

- Summarize five functions of living things.
- Compare plant and animal cells.
- Define and compare the kingdoms of living things.
- Describe different types of organisms.
- Describe the functions of roots, stems, and leaves.
- Explain the processes of photosynthesis and respiration.
- Describe pollination in flowering plants.
- Explain the life cycle of a flowering plant.

The Animal Kingdom

The students will:

- Define animal and list the basic needs and characteristics of animals.
- Summarize the characteristics of groups of invertebrates.
- Define vertebrates and describe their characteristics.
- Define the seven groups of vertebrates.
- Identify seven organ systems of animals.
- Summarize the structures and functions of the seven organ systems.
- Compare incomplete metamorphosis to complete metamorphosis.
- Summarize how traits are passed from parent to offspring.

Exploring Ecosystems

Students will:

- Identify abiotic and biotic factors in an ecosystem.
- Describe ecosystems, communities, and populations.
- Define a biome.
- Describe Earth's six main biomes.
- Explain how energy is cycled through an ecosystem.
- Describe food webs and give examples of predator-and-prey relationships.

Surviving in Ecosystems

Students will:

- Define adaptation and give examples of how adaptations help animals to survive in their habitats.
- Define and describe the types of symbiotic relationships.
- Describe ways in which plants respond to their environments.

- Describe plant adaptations.
- Describe how living and non living things cause ecosystems to change.
- Understand that changes to ecosystems affect living organisms.

Earth Science

Shaping Earth

Students will:

- Identify Earth's landforms and the features of the ocean floor.
- Describe the layers of Earth.
- Describe how the movement of plates builds mountains and causes earthquakes and volcanoes.
- Explain how scientists use seismic waves to study earthquakes.
- Define and give examples of physical and chemical weathering.
- Explain how erosion helps to break down and build up Earth's land.
- Describe the effects of floods, fires, tornadoes, and hurricanes.
- Explain the cause and effects of landslides and avalanches.

Saving Earth's Resources

Students will:

- Describe the properties used to identify and classify minerals.
- Compare the three types of rocks.
- Describe the different layers of soil and how they form.
- Define the texture, porosity, and permeability of soil.
- Describe the different kinds of fossils, the ways they form, and how they provide evidence of Earth's past.
- Explain why fossil fuels are a valuable and nonrenewable resource.
- Explain how the water cycle renews Earth's fresh water.
- Describe ways people use and obtain fresh water.
- Identify the effects of pollution to land, water, and air.
- Describe ways to reduce pollution and conserve resources.

Weather and Climate

Students will:

- Define the atmosphere as a mixture of different gases.
- Describe four properties of weather that can be measured and the tools used to measure them.
- Sequence the steps of the water cycle.
- Identify and describe types of clouds and precipitation.
- Explain how air masses form and identify the types of weather they cause.
- Forecast the weather by interpreting data on a weather map.
- Define and give examples of climate.
- Explain the main factors that determine climate.

The Solar System and Beyond

Students will:

- Explain how Earth's rotation causes the cycle of day and night.
- Explain why the Sun's apparent motion in the sky differs from season to season.
- Explain why the Moon is covered with craters.
- Identify the causes of the Moon's phases, solar eclipses, and lunar eclipses.
- Define and describe the solar system.
- Discuss the properties of the inner and outer planets.
- Explore stars, including their composition, appearance, and distance from Earth.
- Identify the characteristics of the Sun and its importance to life on Earth.

Matter

Properties of Matter

Students will:

- Define and describe the three states of matter.
- Compare and contrast properties of matter.
- Describe some properties of matter that can be measured.
- Measure properties of matter using correct units.
- Explore how matter is classified.
- Explain how elements are organized in the periodic table.

Matter and Its Changes

Students will:

- Comprehend that a change of state is a physical change.
- Differentiate between physical change and chemical change.
- Explain that mixtures are combinations of matter.
- Describe ways of separating mixtures.
- Describe how compounds form and their physical properties.
- Compare and contrast acid and bases.

Forces and Energy

Forces

Students will:

- Explain how motion, speed, velocity, and acceleration are related.
- Summarize the forces that act on a moving object, including friction and gravity.
- Demonstrate a basic understanding of how forces affect motion.
- Explain how friction affects motion.

- Define work and energy.
- Compare and contrast potential and kinetic energy.
- Identify the different kinds of simple machines.
- Explain how simple machines work together to make compound machines.

Energy

Students will:

- Explain that heat flows from warmer materials to cooler materials.
- Describe and define conduction, convection, and radiation.
- Explain how sound is produced and how it travels through a medium.
- Identify the characteristics of sound, including frequency, pitch, volume, and echoes.
- Demonstrate that light travels in a straight line.
- Describe ways light can be absorbed, reflected, or refracted by objects.
- Describe the characteristics of electrically charged objects.
- Explain the difference between static and current electricity.
- Describe a magnetic field and the effect of distance on magnetic force.
- Understand how an electromagnet, an electric motor, and a generator work.

Health Science

Students will:

- Explain the four chambers of the heart and understand how the heart pumps blood throughout the body.
- Explain the importance of the respiratory system, and what organs are involved.
- Understand how the two systems work together.
- Describe the effects that cigarette smoking has on the respiratory system.

Text

Science A Closer Look, Macmillan/McGraw Hill, 2008 edition.

Additional Resources

- **Materials Kits** – used to support Science activities
- **Activity Flipcharts**
- **Reading Resources**
- **Key Resources** – used to support instruction, build skills, and promote comprehension

Instruction:

Teacher-directed whole class instruction
Cooperative heterogeneous grouping

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