

Science Grade 5

Strand:

S1 Scientific Inquiry The student demonstrates abilities necessary to do scientific inquiry and an understanding about scientific inquiry; that is, the student:

Standards:

- S1a:** develops questions about objects, organisms and phenomena that can be answered through scientific investigations.
- S1b:** accesses, evaluates and uses information from a variety of sources.
- S1c:** designs and conducts scientific investigations based upon the nature of the questions asked.
- S1d:** employs appropriate tools and techniques to systematically collect, record, analyze, interpret, and present data.
- S1e:** uses evidence from reliable sources to develop logical descriptions, predictions, explanations, and models.
- S1f:** asks questions about scientific knowledge.
- S1g:** communicates findings and conclusions of investigations using scientific language, writing, and mathematics.

Strand:

S2 History and Nature of Science The student demonstrates an understanding and appreciation of science as a human endeavor, to include the nature and history of science; that is, the student:

Standards:

- S2a:** knows that doing science requires varying human abilities, interest and habits of mind (such as: reasoning, insight, skill, creativity, intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas).
- S2b:** describes examples of scientists working in teams and alone to solve problems.
- S2c:** explains the variety of contributions and discoveries about objects, events, and phenomena in nature that were made by men and women who chose careers in science.
- S2d:** describes ways that scientists have used new evidence to make modifications to existing explanations.

Strand:

S3 Science in Personal and Social Perspectives The student demonstrates an understanding of safety, and the risks and benefits associated with natural and personal hazards; that is, the student:

Standards:

- S3a:** demonstrates personal and group safety and resource conservation.
- S3b:** explores the personal and societal challenges caused by both natural hazards and hazards that result from human activities.
- S3c:** utilizes a systematic approach to analyze risks and benefits associated with natural and personal hazards.
- S3d:** compares the positive and negative impacts of technological advances on society.

Strand:

S4 Science and Technology

The student demonstrates an understanding about science and technology and the nature of technological design; that is, the student:

Standards:

- S4a:** demonstrates how tools and technology advance scientific investigations and knowledge.
- S4b:** uses technology to assist in the design of solutions to identified problems.
- S4c:** determines criteria to evaluate the effectiveness of a solution.
- S4d:** evaluates an invention that solves a problem and determines ways to improve the design.

Strand:

S5 Physical Science

The student demonstrates a conceptual understanding of matter, motion and energy; that is, the student:

Standard:

S5a: examines and describes properties of common elements.

Components:

- S5a.1:** All materials are composed of basic ingredients called elements.
- S5a.2:** Elements have unique physical and chemical properties.
- S5a.3:** Materials may undergo physical and chemical changes. When elements are combined, the new material has properties that are different from the original materials.

Standard:

S5b: measures, explains, and predicts the relationship between the strength of a force and its effect on the motion of an object.

Components:

- S5b.1:** Forces work in equal and opposite pairs – action and reaction.
- S5b.2:** The strength of the force is related to the size of change.
- S5b.3:** An equivalent force moves an object with less mass more than it moves an object with more mass.
- S5b.4:** Gravity pulls any object toward it without touching it.

Standard:

S5c: demonstrates that energy occurs in different forms (heat, light, sound, electrical, and magnetic) and can change forms.

Components:

- S5c.1:** Energy exists in multiple forms.
- S5c.2:** Energy can change from one form to another; but under ordinary conditions no energy is lost or created.

Strand:

S6 Life Science

The student demonstrates a conceptual understanding of the structure and function of living systems, and ecosystems; that is, the student:

Standard:

S6a: describes the cell as the basic structure of all organisms, and explains its organization into tissues, organs, and systems, including their structures and functions.

Components:

- S6a.1:** Hand lenses and microscopes make it possible to see that organisms are made of cells.
- S6a.2:** Some organisms consist of a single cell. Like familiar organisms, they need food, water, and air; a way to dispose of waste; and an environment that supports their needs.
- S6a.3:** Some organisms are made of a collection of similar cells that benefit from cooperating. Some organism's cells vary greatly in appearance and perform very different roles in the organism.

Standard: **S6b:** explains why reproduction is essential to the continuation of a species.
Component: **S6a.1:** Reproduction is a characteristic of all living things. Because no living organisms live forever, reproduction is essential for the continuation of a species.

Standard: **S6c:** examines and describes the flow of matter and energy in ecosystems and develops examples of food chains and food webs that show the interdependence of organisms in an environment.

Components: **S6c.1:** Some source of “energy” is needed for all organisms to stay alive and grow.
S6c.2: Over the whole Earth, organisms are growing, dying, and decaying, and new organisms are being produced from the old ones.
S6c.3: Almost all kinds of animals’ food can be traced back to plants.
S6c.4: Insects and various other organisms depend on dead plant and animal material for food.
S6c.5: Organisms interact with one another in various ways besides providing food. Many plants depend on animals for carrying their pollen to other plants or for dispersing their seeds.
S6c.6: Food chains and food webs illustrate the interrelationships among organisms in a particular environment.

Strand:
S7 Earth and Space Sciences

The student demonstrates a conceptual understanding of Earth’s systems, history, and significance in the solar system; that is, the student:

Standard: **S7a:** investigates and describes the composition and structure of the lithosphere and classifies rocks/minerals and their associated fossils.

Components: **S7a.1:** The Earth is mostly rock. Three-fourths of its surface is covered by a relatively thin layer of water (some of it frozen), and the entire planet is surrounded by a relatively thin blanket of air. It is the only body in the solar system that appears able to support life. The other planets have compositions and conditions very different from the Earth’s.
S7a.2: The solid Earth is layered with a lithosphere, the mantle, and a core.
S7a.3: Some changes in the solid Earth can be described as the rock cycle. Old rocks at the Earth’s surface weather, forming sediments that are buried, then compacted, heated, and often recrystallized into new rock.
S7a.4: Fossils are formed through burial, mineral replacement, or encasement.
S7a.5: Soil consists of weathered rock and decomposed organic material from dead plants, animals, and bacteria.
S7a.6: Water, which covers the majority of the Earth’s surface, circulates through the crust, oceans, and atmosphere in what is known as the water cycle.
S7a.7: Water is a solvent. As it passes through the water cycle, it dissolves minerals and gases and carries them to the oceans and into the atmosphere.
S7a.8: The atmosphere is a mixture of nitrogen, oxygen, and trace gases that include water vapor. The atmosphere has different properties at different elevations.

- Standard: **S7b:** discusses how global weather patterns and climate relate to local weather.
- Components: **S7b.1:** Local weather is generally but not always related to global weather patterns. Local topography and/or geographic conditions may create unique weather conditions.
- S7b.2:** Climate is weather over long periods of time.
- S7b.3:** The Earth has large-scale global weather patterns that impact both local weather and climate.
- Standard: **S7c:** describes the relationships among the Earth, sun, and moon (i.e., tilt of axis, revolution, rotation) as it relates to seasons, tides, and eclipses.
- Components: **S7c.1:** The Earth is the third planet from the sun in a system that includes the moon, the sun, eight other planets and their moons, along with other objects as asteroids and comets.
- S7c.2:** Most objects in the solar system are in regular and predictable motion. Those motions explain such phenomena as the day (rotation) and the year (revolution).
- S7c.3:** Gravity is the force that keeps planets in orbit around the sun and governs the rest of the motion in the universe.
- S7c.4:** The Earth is one of several planets that orbit the sun, and the moon orbits around the Earth.
- S7c.5:** Things on or near the Earth are pulled toward it by the Earth's gravity.
- S7c.6:** The patterns of stars in the sky stay the same, although they appear to move across the sky nightly, and different stars can be seen in different seasons.
- S7c.7:** Planetary bodies are tilted on their axes which impact the amount of light received during revolution.