



The Nature of Matter

Standard 1:

The student understands that all matter has observable, measurable properties. (SC.A.1.2)

1. determines that the properties of materials (e.g., density and volume) can be compared and measured (e.g., using rulers, balances, and thermometers).
2. knows that common materials (e.g., water) can be changed from one state to another by heating and cooling.
3. knows that the weight of an object always equals the sum of its parts.
4. knows that different materials are made by physically combining substances and that different objects can be made by combining different materials.
5. knows that materials made by chemically combining two or more substances may have properties that differ from the original materials.

Standard 2:

The student understands the basic principles of atomic theory. (SC.A.2.2)

1. knows that materials may be made of parts too small to be seen without magnification.

Energy

Standard 1:

The student recognizes that energy may be changed in form with varying efficiency. (SC.B.1.2)

1. knows how to trace the flow of energy in a system (e.g., as in an ecosystem).
2. recognizes various forms of energy (e.g., heat, light, and electricity).
3. knows that most things that emit light also emit heat.

4. knows the many ways in which energy can be transformed from one type to another.
5. knows that various forms of energy (e.g., mechanical, chemical, electrical, magnetic, nuclear, and radiant) can be measured in ways that make it possible to determine the amount of energy that is transformed.
6. knows ways that heat can move from one object to another.

Standard 2:

The student understands the interaction of matter and energy. (SC.B.2.2)

1. knows that some source of energy is needed for organisms to stay alive and grow.
2. recognizes the costs and risks to society and the environment posed by the use of nonrenewable energy.
3. knows that the limited supply of usable energy sources (e.g., fuels such as coal or oil) places great significance on the development of renewable energy sources.

Force and Motion

Standard 1:

The student understands that types of motion may be described, measured, and predicted. (SC.C.1.2)

1. understands that the motion of an object can be described and measured.
2. knows that waves travel at different speeds through different materials.

Standard 2:

The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted. (SC.C.2.2)

1. recognizes that forces of gravity, magnetism, and electricity operate simple machines.
2. knows that an object may move in a straight line at a constant speed, speed up, slow down, or change direction dependent on net force acting on the object.
3. knows that the more massive an object is, the less effect a given force has.
4. knows that the motion of an object is determined by the overall effect of all of the forces acting on the object.

Processes that Shape the Earth

Standard 1:

The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth. (SC.D.1.2)

1. knows that larger rocks can be broken down into smaller rocks, which in turn can be broken down to combine with organic material to form soil.
2. knows that 75 percent of the surface of the Earth is covered by water.
3. knows that the water cycle is influenced by temperature, pressure, and the topography of the land.
4. knows that the surface of the Earth is in a continuous state of change as waves, weather, and shifts of the land constantly change and produce many new features.
5. knows that some changes in the Earth's surface are due to slow processes and some changes are due to rapid processes.

Standard 2:

The student understands the need for protection of the natural systems on Earth. (SC.D.2.2)

1. knows that using, recycling, and reducing the use of natural resources improve and protect the quality of life.

Earth and Space

Standard 1:

The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth. (SC.E.1.2)

1. knows that the tilt of the Earth on its own axis as it rotates and revolves around the sun causes changes in season, length of day, and energy available.
2. knows that the combination of the Earth's movement and the moon's own orbit around the Earth results in the appearance of cyclical phases of the moon.
3. knows that the sun is a star and that its energy can be captured or concentrated to generate heat and light for work on Earth.
4. knows that the planets differ in size, characteristics, and composition and that they orbit the sun in our Solar System.
5. understands the arrangement of planets in our Solar System.

Standard 2:

The student recognizes the vastness of the universe and the Earth's place in it. (SC.E.2.2)

1. knows that, in addition to the sun, there are many other stars that are far away.

Processes of Life

Standard 1:

The student describes patterns of structure and function in living things. (SC.F.1.2)

1. knows that the human body is made of systems with structures and functions that are related.
2. knows how all animals depend on plants.
3. knows that living things are different but share similar structures.
4. knows that similar cells form different kinds of structures.

Standard 2:

The student understands the process and importance of genetic diversity. (SC.F.2.2)

1. knows that many characteristics of an organism are inherited from the parents of the organism, but that other characteristics are learned from an individual's interactions with the environment.

How Living Things Interact with Their Environment

Standard 1:

The student understands the competitive, interdependent, cyclic nature of living things in the environment. (SC.G.1.2)

1. knows ways that plants, animals, and protists interact.
2. knows that living things compete in a climatic region with other living things and that structural adaptations make them fit for an environment.
3. knows that green plants use carbon dioxide, water, and sunlight energy to turn minerals and nutrients into food for growth, maintenance, and reproduction.
4. knows that some organisms decompose dead plants and animals into simple minerals and nutrients for use by living things and thereby recycle matter.
5. knows that animals eat plants or other animals to acquire the energy they need for survival.
6. knows that organisms are growing, dying, and decaying and that new organisms are being

- produced from the materials of dead organisms.
7. knows that variations in light, water, temperature, and soil content are largely responsible for the existence of different kinds of organisms and population densities in an ecosystem.

Standard 2:

The student understands the consequences of using limited natural resources. (SC.G.2.2)

1. knows that all living things must compete for Earth's limited resources; organisms best adapted to compete for the available resources will be successful and pass their adaptations (traits) to their offspring.
2. knows that the size of a population is dependent upon the available resources within its community.
3. understands that changes in the habitat of an organism may be beneficial or harmful.

The Nature of Science

Standard 1:

The student uses the scientific processes and habits of mind to solve problems. (SC.H.1.2)

1. knows that it is important to keep accurate records and descriptions to provide information and clues on causes of discrepancies in repeated experiments.
2. knows that a successful method to explore the natural world is to observe and record, and then analyze and communicate the results.
3. knows that to work collaboratively, all team members should be free to reach, explain, and justify their own individual conclusions.
4. knows that to compare and contrast observations and results is an essential skill in science.
5. knows that a model of something is different from the real thing, but can be used to learn something about the real thing.

Standard 2:

The student understands that most natural events occur in comprehensible, consistent patterns. (SC.H.2.2)

1. knows that natural events are often predictable and logical.

Standard 3:

The student understands that science, technology, and society are interwoven and interdependent. (SC.H.3.2)

1. understands that people, alone or in groups, invent new tools to solve problems and do work that affects aspects of life outside of science.
2. knows that data are collected and interpreted in order to explain an event or concept.
3. knows that before a group of people build something or try something new, they should determine how it may affect other people.
4. knows that through the use of science processes and knowledge, people can solve problems, make decisions, and form new ideas.