

5th Grade Science State Science Core Scope and Sequence and “I can” Statements (2002)

- The scope is the standards with their objectives and indicators.
- The sequence is any order you want to teach the standards, however, teach each standard in the order they are shown.
- The ”I can “ statements are the indicators under each objective.

Science Benchmark

The weight of an object is always equal to the sum of its parts, regardless of how it is assembled. In a chemical reaction or physical change matter is neither created nor destroyed. When two or more materials are combined, either a chemical reaction or physical change may occur. Chemical reactions are often indicated when materials give off heat or cool as they take in heat, give off light, give off gas, or change colors. In a chemical reaction, materials are changed into new substances. In a physical change a new substance is not formed.

STANDARD I: Students will understand that chemical and physical changes occur in matter.

Objective 1: Describe that matter is neither created nor destroyed even though it may undergo change.

- I can compare the total weight of an object to the weight of its individual parts after being disassembled.
- I can compare the weight of a specified quantity of matter before and after it undergoes melting or freezing.
- I can investigate the results of the combined weights of a liquid and a solid after the solid has been dissolved and then recovered from the liquid (e.g., salt dissolved in water then water evaporated).
- I can investigate chemical reactions in which the total weight of the materials before and after reaction is the same (e.g., cream and vinegar before and after mixing, borax and glue mixed to make a new substance).

Objective 2: Evaluate evidence that indicates a physical change has occurred.

- I can identify the physical properties of matter (e.g., hard, soft, solid, liquid, gas).
- I can compare changes in substances that indicate a physical change has occurred.
- I can describe the appearance of a substance before and after a physical change.

Objective 3: Investigate evidence for changes in matter that occur during a chemical reaction.

- I can identify observable evidence of a chemical reaction (e.g., color change, heat or light given off, heat absorbed, gas given off).
- I can explain why the measured weight of a remaining product is less than its reactants when a gas is produced.
- I can cite examples of chemical reactions in daily life.
- I can compare a physical change to a chemical change.
- I can hypothesize how changing one of the materials in a chemical reaction will change the results.

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| Science language students should use: | heat, substance, chemical change, dissolve, physical change, matter, product, reactants, solid, liquid, weight |
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Science Benchmark

The Earth's surface is constantly changing. Some changes happen very slowly over long periods of time, such as weathering, erosion, and uplift. Other changes happen abruptly, such as landslides, volcanic eruptions, and earthquakes. All around us, we see the visible effects of the building up and breaking down of the Earth's surface.

STANDARD II: Students will understand that volcanoes, earthquakes, uplift, weathering, and erosion reshape Earth's surface.

Objective 1: Describe how weathering and erosion change Earth's surface.

- a. I can identify the objects, processes, or forces that weather and erode Earth's surface (e.g., ice, plants, animals, abrasion, gravity, water, wind).
- b. I can describe how geological features (e.g., valleys, canyons, buttes, arches) are changed through erosion (e.g., waves, wind, glaciers, gravity, running water).
- c. I can explain the relationship between time and specific geological changes.

Objective 2: Explain how volcanoes, earthquakes, and uplift affect Earth's surface.

- a. I can identify specific geological features created by volcanoes, earthquakes, and uplift.
- b. Give examples of different landforms that are formed by volcanoes, earthquakes, and uplift (e.g., mountains, valleys, new lakes, canyons).
- c. I can describe how volcanoes, earthquakes, and uplift change landforms.
- d. I can cite examples of how technology is used to predict volcanoes and earthquakes.

Objective 3: Relate the building up and breaking down of Earth's surface over time to the various physical land features.

- a. I can explain how layers of exposed rock, such as those observed in the Grand Canyon, are the result of natural processes acting over long periods of time.
- b. I can describe the role of deposition in the processes that change Earth's surface.
- c. I can use a time line to identify the sequence and time required for building and breaking down of geologic features on Earth.
- d. I can describe and justify how the surface of Earth would appear if there were no mountain uplift, weathering, or erosion.

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| Science language students should use: | earthquakes, erode, erosion, faults, uplift, volcanoes, weathering, buttes, arches, glaciers, geological, deposition |
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Science Benchmark

Earth and some earth materials have magnetic properties. Without touching them, a magnet attracts things made of iron and either pushes or pulls on other magnets. Electricity is a form of energy. Current electricity can be generated and transmitted through pathways. Some materials are capable of carrying electricity more effectively than other materials. Static electricity is a result of objects being electrically charged. Without touching them, materials that are electrically charged may either push or pull other charged materials.

STANDARD III: Students will understand that magnetism can be observed when there is an interaction between the magnetic fields of magnets or between a magnet and materials made of iron.

Objective 1: Investigate and compare the behavior of magnetism using magnets.

- a. I can compare various types of magnets (e.g., permanent, temporary, and natural magnets) and their abilities to push or pull iron objects they are not touching.
- b. I can investigate how magnets will both attract and repel other magnets.
- c. I can compare permanent magnets and electromagnets.
- d. I can research and report the use of magnets that is supported by sound scientific principles.

Objective 2: Describe how the magnetic field of Earth and a magnet are similar.

- a. I can compare the magnetic fields of various types of magnets (e.g., bar magnet, disk magnet, horseshoe magnet).
- b. I can compare Earth's magnetic field to the magnetic field of a magnet.
- c. I can construct a compass and explain how it works.
- d. I can investigate the effects of magnets on the needle of a compass and compare this to the effects of Earth's magnetic field on the needle of a compass (e.g., magnets effect the needle only at close distances, Earth's magnetic field affects the needle at great distances, magnets close to a compass overrides the Earth's effect on the needle).

STANDARD IV: Students will understand features of static and current electricity.

Objective 1: Describe the behavior of static electricity as observed in nature and everyday occurrences.

- a. I can list several occurrences of static electricity that happen in everyday life.
- b. I can describe the relationship between static electricity and lightning.
- c. I can describe the behavior of objects charged with static electricity in attracting or repelling without touching.
- d. I can compare the amount of static charge produced by rubbing various materials together (e.g., rubbing fur on a glass rod produces a greater charge than rubbing the fur with a metal rod, the static charge produced when a balloon is rubbed on hair is greater than when a plastic bag is rubbed on hair).
- e. I can investigate how various materials react differently to statically charged objects.

Objective 2: Analyze the behavior of current electricity.

- a. I can draw and label the components of a complete electrical circuit that includes switches and loads (e.g., light bulb, bell, speaker, motor).
- b. I can predict the effect of changing one or more of the components (e.g., battery, load, wires) in an electric circuit.
- c. I can generalize the properties of materials that carry the flow of electricity using data by testing different materials.
- d. I can investigate materials that prevent the flow of electricity.
- e. I can make a working model of a complete circuit using a power source, switch, bell or light, and a conductor for a pathway.

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| Science language students should use: | battery, complete circuit, incomplete circuit, current, conductor, insulator, pathway, power source, attract, compass, electromagnetism, magnetic force, magnetic field, natural magnet, permanent magnet, properties, repel, static electricity, temporary magnet, switch, load |
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Science Benchmark

All living things inherit a set of characteristics or traits from their parents. Members of any given species transfer traits from one generation to the next. The passing of traits from parent to offspring is called heredity and causes the offspring to resemble the parent. Some traits differ among members of a population, and these variations may help a particular species to survive better in a given environment in getting food, finding shelter, protecting itself, and reproducing. These variations give the individual a survival advantage over other individuals of the same species.

STANDARD V: Students will understand that traits are passed from the parent organisms to their offspring, and that sometimes the offspring may possess variations of these traits that may help or hinder survival in a given environment.

Objective 1: Using supporting evidence, show that traits are transferred from a parent organism to its offspring.

- a. I can make a chart and collect data identifying various traits among a given population (e.g., the hand span of students in the classroom, the color and texture of different apples, the number of petals of a given flower).
- b. I can identify similar physical traits of a parent organism and its offspring (e.g., trees and saplings, leopards and cubs, chickens and chicks).
- c. I can compare various examples of offspring that do not initially resemble the parent organism but mature to become similar to the parent organism (e.g., mealworms and darkling beetles, tadpoles and frogs, seedlings and vegetables, caterpillars and butterflies).
- d. I can contrast inherited traits with traits and behaviors that are not inherited but may be learned or induced by environmental factors (e.g., cat purring to cat meowing to be let out of the house; the round shape of a willow is inherited, while leaning away from the prevailing wind is induced).
- e. I can investigate variations and similarities in plants grown from seeds of a parent plant (e.g., how seeds from the same plant species can produce different colored flowers or identical flowers).

Objective 2: Describe how some characteristics could give a species a survival advantage in a particular environment.

- a. I can compare the traits of similar species for physical abilities, instinctual behaviors, and specialized body structures that increase the survival of one species in a specific environment over another species (e.g., difference between the feet of snowshoe hare and cottontail rabbit, differences in leaves of plants growing at different altitudes, differences between the feathers of an owl and a hummingbird, differences in parental behavior among various fish).
- b. I can identify that some environments give one species a survival advantage over another (e.g., warm water favors fish such as carp, cold water favors fish such as trout, environments that burn regularly favor grasses, environments that do not often burn favor trees).
- c. I can describe how a particular physical attribute may provide an advantage for survival in one environment but not in another (e.g., heavy fur in arctic climates keep animals warm whereas in hot desert climates it would cause overheating; flippers on such animals as sea lions and seals provide excellent swimming structures in the water but become clumsy and awkward on land; cacti retain the right amount of water in arid regions but would develop root rot in a more temperate region; fish gills have the ability to absorb oxygen in water but not on land).
- d. I can research a specific plant or animal and report how specific physical attributes provide an advantage for survival in a specific environment.

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| Science language students should use: | inherited, environment, species, offspring, traits, variations, survival, instincts, population, specialized structure, organism, life cycle, parent organism, learned behavior |
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