# Science 6th Grade

1st Quarter

**Standard 1:** Students will learn that all of the characteristics of an organism, its color, shape, size, and how it functions, are dictated by a molecule that is a very small part of a very tiny cell—DNA.

**Topic:** Cells, Genetics, and Heredity (Unit A)

| Week | Performance Objectives | Performance Indicators | SA | TA |
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| 1 | • Recognize that all living things are made up of cells<br>• Compare the functions and structures of plant and animal cells<br>• Describe how the nucleus of a cell directs its functions | I can investigate the parts that make up a plant cell | | |
| | | I can learn about the parts of plant and animal cells and how the cell parts work | | |
| | | I can link to math, writing, and technology | | |
| | • Compare the processes of mitosis and meiosis<br>• Recognize that different combinations of parental DNA produce variation in new organisms | I can investigate how exact copies are made of cells | | |
| | | I can learn about two different ways in which cells reproduce | | |
| | | I can link to math, writing, and technology | | |
| 2 | • Recognize that a plant's or animal's traits are inherited from its parents<br>• Identify genes as the inherited factors that determine traits<br>• Describe what traits will appear in an offspring using a punnet square | I can investigate how the traits are inherited | | |
| | | I can learn about how traits are passed from parent to offspring | | |
| | | I can link to math, writing, social studies, and technology | | |

**Standard 2:** Students will learn that organisms are grouped by the things they have in common: shape, size, structure. As scientists discover more about the structures of living things, classification systems change.

**Topic:** Classification

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| 2 | • Recognize that scientists classify animals in order to show ways in which they are related<br>• Identify the characteristics scientists use to classify organisms<br>• Conclude that all living things belong to one of five kingdoms<br>• Recognize that classifications systems change as additional information about organisms becomes available | I can investigate how to classify objects | | |
| | | I can learn about the kingdoms into which scientists classify living things | | |
| | | I can link to math, writing, health, and technology | | |
| 3 | • Recognize that kingdoms are divided into smaller groups<br>• Describe the two-part scientific name of an organism<br>• Demonstrate how to use a dichotomous key to identify living things | I can investigate how to develop a system for identifying beans | | |
| | | I can learn about the seven levels of classification and how to use a dichotomous key | | |
| | | I can link to math, writing, language arts, and technology | | |

**Standard 3:** Students will learn that the specific ways plants respond to light, touch, and gravity allow plants to adjust to changes during their lives.

**Topic:** Plant Growth and Responses

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| 3 | • Describe how plants grow from seeds<br>• List what plants need in order to grow<br>• Compare xylem and phloem<br>• Distinguish between vascular and nonvascular plants | I can investigate seed germination and seedling growth | | |
| | | I can learn about the growth, plant structures, an how plants meet their needs | | |
| | | I can link to math, writing, art, and technology | | |
| 4 | • Describe how plants respond to light, gravity, and touch<br>• Explain how tropisms help plants survive<br>• Compare long-day and short-day plants | I can investigate how roots respond to the environment | | |
| | | I can learn about how plants respond to light, gravity, touch, and length of the day | | |
| | | I can link to math, writing, social studies, and technology | | |
| **Standard 4:** Students will learn that plants are distinguished from one another by the structures and adaptations each plant has. Different plants have different life cycles that reflect the environments in which they grow and reproduce. | | | | |
| Topic: Types of Plants | | | | |
| 4 | • Compare the structures of vascular and nonvascular plant<br>• Describe the life cycle of mosses | I can investigate where mosses grow | | |
| | | I can learn about the structures of mosses and how they reproduce | | |
| | | I can link to math, writing, social studies, and technology | | |
| 5 | • Describe the life cycles of ferns and gymnosperms<br>• Explain adaptations for survival in ferns and gymnosperms | I can investigate how ferns differ from conifers | | |
| | | I can learn about the structures of ferns and gymnosperms and how they reproduce | | |
| | | I can link to math, writing, social studies, and technology | | |
| | • Recognize the features of angiosperms<br>• Describe the structures of flowers and their functions in reproduction<br>• List the ways in which pollination occurs | I can investigate the parts of a flower | | |
| | | I can learn about the functions and the parts of angiosperms | | |
| | | I can link to math, writing, and technology | | |
| 6 | • List the differences between monocots and dicots<br>• Describe the parts of fruits and seeds<br>• Explain how seeds are distributed<br>• Explain how plants reproduce asexually | I can investigate the structures of seeds | | |
| | | I can learn about how angiosperms reproduce | | |
| | | I can link to math, writing, art, and technology | | |
| **Standard 5:** Students will learn that the structures and adaptation of vertebrates and invertebrates reflect the environments in which they live and the ways they live. | | | | |
| Topic: Invertebrates | | | | |
| 6 | • Recognize that all animals have the same basic needs<br>• Conclude that animals meet their basic needs in different ways<br>• Distinguish between vertebrate and invertebrate animals | I can investigate how to design an environment for an animal | | |
| | | I can learn about how animals meet their needs and how animals are classified | | |
| | | I can link to math, writing, physical education, and technology | | |
| 7 | • Describe the important characteristics of sponges, cnidarians, and worms<br>• Compare and Contrast the structures in these three types of invertebrates | I can investigate sponges, planarians, and hydras | | |
| | | I can learn about the body structures and the cycles of sponges, cnidarians, and worms | | |

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| | | I can link to math, writing, social studies, and technology | | |
| | • Describe the distinguishing characteristics of mollusks, arthropods, and echinoderms<br>• Identify examples of each of these three types of invertebrates | I can investigate the structure of some mollusks, arthropods, and echinoderms | | |
| | | I can learn about the adaptations of mollusks, arthropods, and echinoderms | | |
| | | I can link to math, writing, art, and technology | | |

# *** END OF FIRST QUARTER ***

## 2nd Quarter

**Standard 1:** Students will learn that vertebrates have adaptations and life cycles that reflect their modes of life.

**Topic:** Vertebrates

| Week | Performance Objectives | Performance Indicators | SA | TA |
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| 1 | • Distinguish between fish and amphibians<br>• Describe the structure of fish and amphibians and how they meet their needs | I can investigate similarities and differences between fish and amphibians | | |
| | | I can learn about the structures and life processes of fish and amphibians | | |
| | | I can link to math, writing, language arts, and technology | | |
| | • Explain where reptiles, birds, and mammals live<br>• List the characteristics of reptiles, birds, and mammals<br>• Describe three different kinds of mammals | I can investigate the skeletons of reptiles, birds, and mammals | | |
| | | I can learn about how reptiles, birds, and mammals carry out life functions | | |
| | | I can link to math, writing, art, and technology | | |
| **Standard 2:** Students will learn that all the factors—biotic and abiotic—in an ecosystem interact both to define the system and to change it. | | | | |
| **Topic:** Ecosystems—Characteristics and Cycles | | | | |
| 2 | • Categorize living elements of an ecosystem as members of a population, a community, and an ecosystem<br>• Describe the interdependent relationships of biotic and abiotic factors in an ecosystem | I can investigate how climates affect ecosystems | | |
| | | I can learn about the ways living and non-living things interact in an ecosystem | | |
| | | I can link to math, writing, art, and technology | | |
| | • Identify the three types of land biomes<br>• Describe how plants and animals are adapted for living in these biomes | I can investigate the locations of biomes worldwide | | |
| | | I can learn about Earth's land ecosystem | | |
| | | I can link to math, writing, social studies, and technology | | |
| 3 | • Recognize that abiotic elements flow through an ecosystem in cycles<br>• Describe the cycles of water, carbon dioxide, oxygen, and nitrogen | I can investigate the formation of groundwater | | |
| | | I can learn about three natural cycles and why they are important to ecosystems | | |
| | | I can link to math, writing, social studies, and technology | | |

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| | • Identify natural resources as reusable, renewable, and non-renewable<br>• Conclude that humans can conserve, reuse, and recycle to slow down the loss of human resources | I can investigate the recycling of paper | | |
| | | I can learn about natural resources and how they are used | | |
| | | I can link to math, writing, social studies, and technology | | |
| **Standard 3:** Students will learn that living things interact in ways in order to obtain energy for growth and reproduction. | | | | |
| **Topic:** Interactions in Ecosystems | | | | |
| 4 | • Recognize the roles of producers, consumers, and decomposers in an ecosystem<br>• Describe the movement of energy in an ecosystem in food chains and food webs<br>• Analyze how energy is transferred and lost at each level of the food chain | I can investigate what owls eat | | |
| | | I can learn about feeding relationships in ecosystems | | |
| | | I can link to math, writing, social studies, and technology | | |
| | • Distinguish between the three types of symbiosis<br>• Identify how different organisms are helped or harmed by their symbiotic relationships with other organisms | I can investigate hydras | | |
| | | I can link to math, writing, health, and technology | | |
| | | I can learn about three kinds of relationships between living things of different species | | |
| Standard 4: Students will learn that the oceans contain important landforms and ecosystems that often affect life on land. | | | | |
| **Topic:** Earth's Oceans | | | | |
| 5 | • Identify three regions of the ocean floor<br>• Recognize the different features of the ocean floor<br>• Describe how islands are formed | I can investigate methods of mapping the ocean floor | | |
| | | I can learn about the features of the ocean floor | | |
| | | I can link to math, writing, social studies, and technology | | |
| | • Conclude that oceans contain a wide variety of ecosystems<br>• Recognize that ocean environments may be classified according to their depth<br>• Analyze the three ocean ecosystems | I can investigate the ocean ecosystems | | |
| | | I can learn about the variety of life in the ocean's biological communities | | |
| | | I can link to math, writing, social studies, and technology | | |
| Standard 5: Students will learn that factors in the atmosphere interact to make and change weather. In many cases, the changes are predictable, but often they can result in dramatic, unpredictable changes. | | | | |
| **Topic:** Weather Changes | | | | |
| 6 | • Describe the composition of the atmosphere<br>• Compare the characteristics of the four layers of the atmosphere | I can investigate the layers of the atmosphere | | |
| | | I can learn about what the atmosphere is made of and how it is layered | | |
| | | I can link to math, writing, social studies, and technology | | |
| | • Describe how air masses affect weather<br>• Recognize that global winds move air masses<br>• Compare warm fronts, cold fronts, stationary fronts, and occluded fronts | I can investigate the effects of air pressure | | |
| | | I can learn about how air masses with different properties cause our weather | | |
| | | I can link to math, writing, social studies, and technology | | |

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| | • Describe how meteorologists collect data from weather stations and organize it on surface maps<br>• Identify instruments meteorologists use to predict the weather | I can investigate how to make a station model | | |
| | | I can learn about methods and tools for predicting weather | | |
| | | I can link to math, writing, social studies, and technology | | |
| 7 | • Identify the causes and the effects of the three types of severe storms<br>• Compare the characteristics of the three types of severe storms | I can investigate how meteorologists track the paths of hurricanes | | |
| | | I can learn about how storms develop and what you can do to protect yourself from them | | |
| | | I can link to math, writing, social studies, and technology | | |

*** END OF SECOND QUARTER ***

## 3rd Quarter

**Standard 1:** Students will learn that movements of Earth's plates can result in earthquakes, volcanoes, and different configurations and locations of continents with respect to one another. While the individual changes are not predictable, the overall patterns of change are.

**Topic:** Movement of Earth's Crust

| Week | Performance Objectives | Performance indicators | SA | TA |
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| 1 | • Identify Earth's layers as inner core, outer core, mantle, and crust<br>• Recognize the importance of the nature of asthenosphere in the movement of plates<br>• Conclude that the movement of plates, as well as the movement of air, water, and ice, causes major changes to Earth's surface | I can investigate Earth's layers | | |
| | | I can learn about the structure of Earth | | |
| | | I can link to math, writing, drama, and technology | | |
| | • Explain how Earth's plates move<br>• Describe the different types of boundaries between plates | I can investigate how the movement of Earth's plates affects the continents | | |
| | | I can learn about how Earth's plates move | | |
| | | I can link to math, writing, literature, and technology | | |
| 1 | • Explain how the movement of Earth's plates causes earthquakes and volcanoes<br>• Compare the three types of volcanoes | I can investigate how to find the location of an earthquake | | |
| | | I can learn about the causes of earthquakes and volcanoes | | |
| | | I can link to math, writing, art, and technology | | |

**Standard 2:** Students will learn that rocks are changed from one kind of rock into another through ordinary processes at Earth's surface and just below it.

**Topic:** Rocks and the Rock Cycle

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| 2 | • Describe how igneous rocks form | I can investigate minerals that make up rocks | | |
| | | I can learn about igneous rocks | | |

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| | • Identify various uses of igneous rocks | I can link to math, writing, social studies, and technology | | |
| | • Identify types of sedimentary rocks<br>• Describe how sedimentary rocks form<br>• Identify uses of sedimentary rocks | I can investigate how flowing water erodes sediment | | |
| | | I can learn about sedimentary rocks | | |
| | | I can link to math, writing, social studies, and technology | | |
| 3 | • Describe how metamorphic rocks form<br>• Identify types of metamorphic rocks<br>• Describe how metamorphic rocks are used | I can investigate the formation of metamorphic rocks | | |
| | | I can learn about metamorphic rocks | | |
| | | I can link to math, writing, art, and technology | | |
| | • Describe the rock cycle<br>• Identify where the rock cycle occurs | I can investigate the relationships of the three types of rock | | |
| | | I can learn about how rocks change | | |
| | | I can link to math, writing, language arts, and technology | | |
| **Standard 3:** Students will learn that years, seasons, day and night, and phases of moons and planets are all predictable results of the movements of objects in the solar system | | | | |
| Topic: Cycles in the Solar System | | | | |
| 4 | • Identify the parts of the solar system<br>• Recognize how far stars are from Earth | I can investigate the size of planets | | |
| | | I can learn about the parts of the solar system | | |
| | | I can link to math, writing, art, and technology | | |
| | • Describe how the planets move on their axes<br>• Describe how the planets move around the sun | I can investigate the orbits of the planets in the solar system | | |
| | | I can learn about the way the planets move | | |
| | | I can link to math, writing, social studies, and technology | | |
| 5 | • Describe why there are seasons on Earth<br>• Describe seasons on other planets | I can investigate why temperatures change during the year | | |
| | | I can learn about the seasons | | |
| | | I can link to math, writing, music, and technology | | |
| 5 | • Describe why the moon has phases<br>• Recognize that planets also can have phases | I can investigate the phases of the moon | | |
| | | I can link to math, writing, art, and technology | | |
| | | I can learn about the phases of moons and planets | | |
| **Standard 4:** Students will learn that stars and galaxies change over periods of time too wide-ranging to observe directly. So, scientists study space to try to infer how and why some of these changes occur. | | | | |
| Topic: Exploring the Universe | | | | |
| 6 | • Recognize that distance affects the brightness of stars<br>• Describe how main-sequence stars produce heat and light<br>• Describe a supernova and explain why our sun will not end its life cycle as a supernova | I can investigate what affects the brightness of stars | | |
| | | I can learn about the life cycle of stars | | |
| | | I can link to math, writing, art, and technology | | |
| | • Explain what a galaxy is<br>• Classify galaxies by shape | I can investigate the shapes of galaxies | | |
| | | I can learn about what galaxies are | | |
| | | I can link to math, writing, social studies, and technology | | |

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| | • Describe early technology used to find out about space<br>• Give examples of ways people explore space | I can investigate how rockets work | | |
| | | I can learn about the way people study space | | |
| | | I can link to math, writing, social studies, and technology | | |
| **Standard 5:** Students will learn that atoms are the building blocks of all matter. The observable properties of matter are dependent upon the atoms of which the matter is composed. | | | | |
| **Topic:** Atoms, Elements, and Compounds | | | | |
| 7 | • Describe the composition of matter<br>• Compare and contrast the parts of an atom | I can investigate how to infer the characteristics of an object without observing the object directly | | |
| | | I can learn about the structure of atoms | | |
| | | I can link to math, writing, language arts, and technology | | |
| | • Explain what an element is<br>• Identify elements in the periodic table<br>• Recognize that elements in the same family have similar properties | I can investigate the properties of elements | | |
| | | I can learn about the periodic table of elements | | |
| | | I can link to math, writing, health, and technology | | |
| 7 | • Define a molecule<br>• Identify and compare the states of matter<br>• Explain how matter changes state | I can investigate changes of state | | |
| | | I can learn about the states of matter and how substances change states | | |
| | | I can link to math, writing, social studies, and technology | | |
| 7 | • Define and identify compounds<br>• Classify compounds as acids or bases<br>• Describe some common uses of acids and bases | I can investigate how to identify acids and bases | | |
| | | I can learn about chemical compounds | | |
| | | I can link to math, writing, art, and technology | | |

*** END OF THIRD QUARTER ***

## 4th Quarter

**Standard 1:** Students will learn that matter interacts with other matter in ways that can produce new combinations. Sometimes the combinations can be easily separated, and sometimes they cannot.

Topic: Matter—Properties and Changes

| Week | Performance Objectives | Performance Indicators | SA | TA |
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| 1 | • Recognize the physical properties of matter<br>• Identify which physical properties can be observed and which can be measured<br>• Describe the physical changes matter undergoes | I can investigate how to observe and measure physical properties | | |
| | | I can learn about the physical properties of matter | | |
| | | I can link to math, writing, art, and technology | | |
| | • Compare a chemical change to a physical change | I can investigate physical and chemical changes | | |

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| | • Describe different kinds of chemical reactions<br>• Describe how some chemical changes can be prevented | I can learn about what happens during a chemical change | | |
| | | I can link to math, writing, social studies, and technology | | |
| 2 | • Describe how mixtures are made<br>• Describe how to separate mixtures<br>• Identify different kinds of mixtures and solutions | I can investigate how to make and separate mixtures | | |
| | | I can learn about the properties of mixtures and solutions | | |
| | | I can link to math, writing, social studies, and technology | | |
| **Standard 2:** Students will learn that energy and the movement of energy from one place to another is often the result of the interactions of matter and waves. | | | | |
| **Topic:** Energy | | | | |
| | • Explain how potential energy and kinetic energy are related<br>• Describe how thermal energy moves between substances | I can investigate the change of potential energy to kinetic energy | | |
| | | I can learn about thermal energy and its transfer | | |
| | | I can link to math, writing, language arts, and technology | | |
| | • Recognize why some substances are magnetic<br>• Describe what electricity is<br>• Explain how electricity and magnetism are related | I can investigate a way to generate electricity | | |
| | | I can learn about how electricity and magnetism result from the movement of electrons | | |
| | | I can link to math, writing, language arts, and technology | | |
| | • Describe how chemical energy is stored in the bonds of molecules<br>• Identify ways that chemical energy is used<br>• Explain how chemical and nuclear reactions can be used to produce electricity | I can investigate how chemical reactions can produce electricity | | |
| | | I can learn about how compounds, molecules, and atoms store energy | | |
| | | I can link to math, writing, social studies, and technology | | |
| **Standard 3:** Students will learn that waves carry energy that can interact with matter in predictable ways. | | | | |
| **Topic:** Sound and Light | | | | |
| 4 | • Recognize how waves carry energy<br>• Identify two different kinds of waves<br>• Recognize how speed, frequency, and wavelength are related | I can investigate how energy can travel in a wave | | |
| | | I can learn about longitudinal and transverse waves | | |
| | | I can link to math, writing, social studies, and technology | | |
| | • Describe the way sound travels through air<br>• Describe what gives sound a different pitch and a different loudness<br>• Describe the speed of sound | I can investigate how to make a simple musical instrument | | |
| | | I can learn about the characteristics of a sound wave | | |
| | | I can link to math, writing, health, and technology | | |
| 5 | • Define light<br>• Describe reflected and refracted life<br>• Define the meanings of transparent, translucent, and opaque | I can investigate the reflection of light | | |
| | | I can learn about how light travels as an electromagnetic wave | | |
| | | I can link to math, writing, art, and technology | | |

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| **Standard 4:** Students will learn that speed, velocity, and changes in velocity are the result of the action of forces on objects. | | | | |
| **Topic:** Forces and Motion | | | | |
| 5 | • Explain what a force is<br>• Relate the force of gravity to mass and distance<br>• Describe how to measure gravity | I can investigate how to build and mark a spring scale | | |
| | | I can learn about gravity | | |
| | | I can link to math, writing, social studies, and technology | | |
| 6 | • Describe motion and explain how to measure it<br>• Describe how force affects motion<br>• List the three laws of motion | I can investigate speed, average speed, and velocity | | |
| | | I can learn about the three laws of motion | | |
| | | I can link to math, writing, physical education, and technology | | |
| | • Explain how the force of friction opposes motion<br>• Predict the results of balanced and unbalanced forces | I can investigate how forces act on objects to cause motion | | |
| | | I can learn about how balanced and unbalanced forces act on an object | | |
| | | I can link to math, writing, physical education, and technology | | |
| **Standard 5:** Students will learn that simple machines help make tasks easier by changing the direction of an applied force, the amount of force that needs to be applied, or both. | | | | |
| **Topic:** Machines and Work | | | | |
| 7 | • Define work<br>• Explain how simple machines make tasks easier<br>• Describe the three types of levers<br>• Compare a lever to a pulley and to a wheel and axle | I can investigate how levers make tasks easier | | |
| | | I can learn about three types of levers and two other simple machines | | |
| | | I can link to math, writing, physical education, and technology | | |
| | • Explain how inclined planes make tasks easier<br>• Describe three simple machines that are related to inclined planes | I can investigate the use of an inclined plane | | |
| | | I can learn about how the different types of inclined planes can make tasks easier | | |
| | | I can link to math, writing, social studies, and technology | | |
| | • Explain how simple machines work together in compound machines<br>• Describe the role of friction in the use of these machines<br>• Explain how to increase a machine's efficiency | I can investigate how simple machines work together | | |
| | | I can learn about how friction reduces the efficiency of a machine | | |
| | | I can link to math, writing, physical education, and technology | | |

*** END OF FOURTH QUARTER ***