

Standard Course of Study Alignment

Science (2010)



Legend

•	The standard is clearly addressed by program activities.
-	This standard potentially could be addressed as part of FIRST® LEGO® League Discover either by actions that the coach or teacher takes when working with the students or by conditions established by the program.

Grade 2

Essential Standard and Clarifying Objectives	Addressed
Forces and Motion	
2.P.1 Understand the relationship between sound and vibrating objects. 2. P.1.1 Illustrate how sound is produced by vibrating objects and columns of air. 2. P.1.2 Summarize the relationship between sound and objects of the body that vibrate – eardrum and vocal cords.	-
Matter: Properties and Change	
2.P.2 Understand properties of solids and liquids and the changes they undergo. 2.P.2.1 Give examples of matter that change from a solid to a liquid and from a liquid to a solid by heating and cooling. 2.P.2.2 Compare the amount (volume and weight) of water in a container before and after freezing. 2.P.2.3 Compare what happens to water left in an open container over time as to water left in a closed container.	
Earth Systems, Structures and Processes	
2.E.1 Understand patterns of weather and factors that affect weather. 2.E.1.1 Summarize how energy from the sun serves as a source of light that warms the land, air and water. 2.E.1.2 Summarize weather conditions using qualitative and quantitative measures to describe: • Temperature • Wind direction • Wind speed • Precipitation 2.E.1.3 Compare weather patterns that occur over time and relate observable patterns to time of day and time of year. 2.E.1.4 Recognize the tools that scientists use for observing, recording, and predicting weather changes from day to day and during the seasons.	
Structures and Functions of Living Organisms	
2.L.1 Understand animal life cycles. 2.L.1.1 Summarize the life cycle of animals including: • Birth • Developing into an adult • Reproducing • Aging and death 2.L.1.2 Compare life cycles of different animals such as, but not limited to, mealworms, ladybugs, crickets, guppies or frogs.	
Evolution and Genetics	
2.L.2 Remember that organisms differ from or are similar to their parents based on the characteristics of the organism. 2.L.2.1 Identify ways in which plants and animals closely resemble their parents in observed appearance and ways they are different. 2.L.2.2 Recognize that there is variation among individuals that are related.	

Grade 3

Essential Standard and Clarifying Objectives	Addressed
Forces and Motion	
3.P.1 Understand motion and factors that affect motion. 3.P.1.1 Infer changes in speed or direction resulting from forces acting on an object. 3.P.1.2 Compare the relative speeds (faster or slower) of objects that travel the same distance in different amounts of time. 3.P.1.3 Explain the effect of earth's gravity on the motion of any object on or near the earth.	●
Matter: Properties and Change	
3.P.2 Understand the structure and properties of matter before and after they undergo a change. 3.P.2.1 Recognize that air is a substance that surrounds us, takes up space and has mass. 3.P.2.2 Compare solids, liquids, and gases based on their basic properties. 3.P.2.3 Summarize changes that occur to the observable properties of materials when different degrees of heat are applied to them, such as melting ice or ice cream, boiling water or an egg, or freezing water.	
Energy: Conservation and Transfer	
3.P.3 Recognize how energy can be transferred from one object to another. 3.P.3.1 Recognize that energy can be transferred from one object to another by rubbing them against each other. 3.P.3.2 Recognize that energy can be transferred from a warmer object to a cooler one by contact or at a distance and the cooler object gets warmer.	-
Earth in the Universe	
3.E.1 Recognize the major components and patterns observed in the earth/moon/sun system. 3.E.1.1 Recognize that the earth is part of a system called the solar system that includes the sun (a star), planets, and many moons and the earth is the third planet from the sun in our solar system. 3.E.1.2 Recognize that changes in the length and direction of an object's shadow indicate the apparent changing position of the Sun during the day although the patterns of the stars in the sky, to include the Sun, stay the same.	
Earth Systems, Structures and Processes	
3.E.2 Compare the structures of the Earth's surface using models or three-dimensional diagrams. 3.E.2.1 Compare Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers). 3.E.2.2 Compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by using models, pictures, diagrams, and maps.	
Structures and Functions of Living Organisms	
3.L.1 Understand human body systems and how they are essential for life: protection, movement and support. 3.L.1.1 Compare the different functions of the skeletal and muscular system. 3.L.1.2 Explain why skin is necessary for protection and for the body to remain healthy.	
Ecosystems	
3.L.2 Understand how plants survive in their environments. 3.L.2.1 Remember the function of the following plant structures as it relates to the survival of plants in their environments: <ul style="list-style-type: none"> • Roots – absorb nutrients • Stems – provide support • Leaves – synthesize food • Flowers – attract pollinators and produce seeds for reproduction. 3.L.2.2 Explain how environmental conditions determine how well plants survive and grow. 3.L.2.3 Summarize the distinct stages of the life cycle of seed plants. 3.L.2.4 Explain how the basic properties (texture and capacity to hold water) and components (sand, clay and humus) of soil determine the ability of soil to support the growth and survival of many plants.	

Grade 4

Essential Standard and Clarifying Objectives	Addressed
Forces and Motion	
<p>4.P.1 Explain how various forces affect the motion of an object.</p> <p>4.P.1.1 Explain how magnets interact with all things made of iron and with other magnets to produce motion without touching them.</p> <p>4.P.1.2 Explain how electrically charged objects push or pull on other electrically charged objects and produce motion.</p>	-
Matter: Properties and Change	
<p>4.P.2 Understand the composition and properties of matter before and after they undergo a change or interaction.</p> <p>4.P.2.1 Compare the physical properties of samples of matter (strength, hardness, flexibility, ability to conduct heat, ability to conduct electricity, ability to be attracted by magnets, reactions to water and fire).</p> <p>4.P.2.2 Explain how minerals are identified using tests for the physical properties of hardness, color, luster, cleavage, and streak.</p> <p>4.P.2.3 Classify rocks as metamorphic, sedimentary, or igneous based on their composition, how they are formed and the processes that create them.</p>	
Energy: Conservation and Transfer	
<p>4.P.3 Recognize that energy takes various forms that may be grouped based on their interaction with matter.</p> <p>4.P.3.1 Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.</p> <p>4.P.3.2 Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, and absorbed.</p>	-
Earth in the Universe	
<p>4.E.1 Explain the causes of day and night and phases of the moon.</p> <p>4.E.1.1 Explain the cause of day and night based on the rotation of Earth on its axis.</p> <p>4.E.1.2 Explain the monthly changes in the appearance of the moon, based on the moon's orbit around the Earth.</p>	
Earth History	
<p>4.E.2 Understand the use of fossils and changes in the surface of the earth as evidence of the history of the Earth and its changing life forms.</p> <p>4.E.2.1 Compare fossils (including molds, casts, and preserved parts of plants and animals) to one another and to living organisms.</p> <p>4.E.2.2 Infer ideas about Earth's early environments from fossils of plants and animals that lived long ago.</p> <p>4.E.2.3 Give examples of how the surface of the earth changes due to slow processes such as erosion and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes.</p>	
Ecosystems	
<p>4.L.1 Understand the effects of environmental changes, adaptations and behaviors that enable animals (including humans) to survive in changing habitats.</p> <p>4.L.1.1 Give examples of changes in an organism's environment that are beneficial to it and some that are harmful.</p> <p>4.L.1.2 Explain how animals meet their needs by using behaviors in response to information received from the environment.</p> <p>4.L.1.3 Explain how humans can adapt their behavior to live in changing habitats (e.g., recycling wastes, establishing rain gardens, planting trees and shrubs to prevent flooding and erosion).</p> <p>4.L.1.4 Explain how differences among animals of the same population sometimes give individuals an advantage in surviving and reproducing in changing habitats.</p>	
Molecular Biology	
<p>4.L.2 Understand food and the benefits of vitamins, minerals and exercise.</p> <p>4.L.2.1 Classify substances as food or non-food items based on their ability to provide energy and materials for survival, growth, and repair of the body.</p> <p>4.L.2.2 Explain the role of vitamins and minerals, and exercise in maintaining a healthy body.</p>	