

Elementary - 4th Grade Science

North Boone CUSD 200

UNITS (4/4 SELECTED)

SUGGESTED DURATION

<input checked="" type="checkbox"/> Unit 1: Structures and Functions of Living Things	<i>15 lessons</i>
<input checked="" type="checkbox"/> Unit 2: Patterns of Earth's Changing Features	<i>20 lessons</i>
<input checked="" type="checkbox"/> Unit 3: Energy and Motion	<i>17 lessons</i>
<input checked="" type="checkbox"/> Unit 4: Wave Patterns and Information	<i>17 lessons</i>

Unit 1: Structures and Functions of Living Things

Elementary - 4th Grade Science - Last Updated on June 4, 2019

STANDARDS

4-LS1-1.: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

4-PS4-2.: Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.

PRIORITY STANDARDS

4-LS1-1.	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
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Unit 1: Structures and Functions of Living Things

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DESIRED RESULTS

Enduring Understandings	Essential Question(s)
Living things have internal and external structures that help them survive, grow, react to stimuli, and reproduce.	How do plant structures help them survive and reproduce? How do animal structures help them survive?

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none">• Key concepts and vocabulary associated with structures and functions of living things, including: adaptation, photosynthesis, stomata, transpiration, respiration, cone, stimulus, response, tropism, structural adaptation, internal structure, respiratory system, external structure• That roots, stems, leaves, and flowers are plant structures with specific functions that allow a plant to survive and reproduce• How a plant produces seeds• How animals use their structures to get the resources they need to survive• How structural adaptations that help animals survive in their environments• How animals use their internal and external structures to survive in their habitats	<ul style="list-style-type: none">• Use key concepts and vocabulary associated with structures and functions of living things in discussions, inquiry activities, and performance tasks• Generate and record observations about plants, and animals• Formulate questions about plants and different animal structures• Explore how water moves through a plant• Design an experiment to test how a plant would react to a water source• Investigate the plant behavior of phototropism• Investigate how different foot structures help animals to survive in their environment• Explore interesting structures of several animals and describe their functions• Observe the structures of a snail and how the snail uses these structures to respond to changes in its environment• Design a model foot structure that will help an animal survive in its environment

Unit 2: Patterns of Earth's Changing Features

Elementary - 4th Grade Science - Last Updated on June 4, 2019

STANDARDS

4-ESS1-1: Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

4-ESS2-1: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth's features.

PRIORITY STANDARDS

4-ESS1-1	Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
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4-ESS2-2	Analyze and interpret data from maps to describe patterns of Earth's features.
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Unit 2: Patterns of Earth's Changing Features

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DESIRED RESULTS

Enduring Understandings	Essential Question(s)
<p>Patterns of rock formations show the changes over time from earth forces, such as earthquakes.</p> <p>The presence and location of certain fossil types show the order in which rock layers were formed.</p> <p>Major features that shape the earth such as mountain ranges, ocean floor structures and trenches, earthquakes, and volcanoes occur in patterns.</p> <p>Most earthquakes and volcanoes occur along boundaries between continents and oceans.</p> <p>Major mountain chains form inside continents or near their edges.</p> <p>Maps help to locate different land and water feature areas of Earth</p>	<p>What are Earth's features?</p> <p>How do living and nonliving things change Earth's surface?</p> <p>What can rock formations tell us about Earth's history?</p>

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none"> • Key concepts and vocabulary associated with patterns of Earth's changing features, including: landform, continent, plate tectonics, volcano, earthquake, fault, topographical map, weathering, acid rain, vegetation, erosion, deposition, landslide, avalanche, sedimentary rock, sediment, fossil, index fossil • Types of landforms that cover Earth's surface • Features that can be found on the ocean floor • How Earth's surface is constantly changing • Different ways scientists use maps to share and interpret data 	<ul style="list-style-type: none"> • Use key concepts and vocabulary associated with patterns of Earth's changing features in discussions, inquiry activities, and performance tasks • Generate and record ideas about Earth's landforms, patterns, landform change, and the history of Earth's surface • Formulate questions about Earth's land and water features, landslides, and fossils in rock layers • Model the movement of the ground during an earthquake • Examine erosional and depositional features on Earth's surface, including: stream-eroded valleys,

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Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none">• Locations of Earth's various features, including: volcanoes, earthquakes, mountains, trenches, and ridges• How three-dimensional features are shown on a two-dimensional map• How to determine the elevation of various features based on contour lines that appear on topographic maps• The different types of physical weathering, erosion, and deposition• How paleontologists find and recover fossils• How scientists examine rocks to understand what the climate and environmental conditions were like on Earth in the past• How earthquakes and weathering can change Earth's surface	<ul style="list-style-type: none">glacial moraines, sand dunes, barrier islands, and deltas• Describe patterns of rock formations to reveal changes over time due to earth forces like earthquakes• Investigate the relationship between plate boundaries, volcanoes, and earthquakes• Create a topographical map of a section of a distant planet that has been discovered• Model weathering using rocks and moving water• Investigate and look for evidence about how plants weather landforms• Predict how much a mountain erodes over time• Observe erosion in action via simulation• Model what happens in a landslide• Model how imprint fossils are formed• Describe the presence and location of certain fossil types indicate the order in which rock layers were formed• Create model fossils and rock layers to explore how scientists learn about the relative ages of fossils• Research four different types of fossils (mold fossils, trace fossils, cast fossils, and true form fossils) drawing an example of each and explaining how the drawing illustrates that type of fossil

Unit 3: Energy and Motion

Elementary - 4th Grade Science - Last Updated on June 4, 2019

STANDARDS

4-PS3-1.: Use evidence to construct an explanation relating the speed of an object to the energy of that object.

4-PS3-3.: Ask questions and predict outcomes about the changes in energy that occur when objects collide.

PRIORITY STANDARDS

4-PS3-1.	Use evidence to construct an explanation relating the speed of an object to the energy of that object.
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Unit 3: Energy and Motion

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DESIRED RESULTS

Enduring Understandings	Essential Question(s)
<p>The faster an object is moving, the more energy it possesses.</p> <p>When objects collide, energy can be transferred from one object to another, thereby changing their motion. Some energy is typically also transferred to the surrounding air producing heat and sound.</p>	<p>How are energy and speed related?</p> <p>What happens when objects collide?</p>

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none">• Key concepts and vocabulary associated with energy and motion, including: speed, velocity, acceleration, energy, potential energy, kinetic energy, contact force, noncontact force, gravity, energy, transfer, inertia• How the words <i>speed</i>, <i>velocity</i>, and <i>acceleration</i> describe motion• The relationship between speed and kinetic energy• How forces are related to energy and speed and how mass affects these forces• Energy can be transferred in various ways and can be transferred between objects• The difference between contact forces and noncontact forces and how both can affect motion• How different types of forces affect motion and energy transfer• The Law of Conservation of Energy and how it applies to a collision• How inertia and momentum affect objects during a collision• How force and energy are related and affect energy transfer in a collision	<ul style="list-style-type: none">• Use key concepts and vocabulary associated with energy and motion in discussions, inquiry activities, and performance tasks• Generate and record ideas about energy and how it is transferred between moving objects following a collision• Formulate questions about moving objects and what happens when objects collide• Explore and explain how the height of a ramp affects the speed of a marble• Observe and explain how mass affects the kinetic energy of an object• Draw conclusions from data about what happens when the amount of energy applied to an object changes• Explore how different materials affect collisions• Observe how energy is transferred in a collision via simulation• Construct a device to withstand the force of a collision to protect an egg from cracking• Design, test, and manipulate a roller coaster model so that when two marbles collide one moves and the other stops

Unit 4: Wave Patterns and Information

Elementary - 4th Grade Science - Last Updated on June 4, 2019

STANDARDS

4-PS4-1.: Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

4-PS4-3.: Generate and compare multiple solutions that use patterns to transfer information.

PRIORITY STANDARDS

4-PS4-1.	Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
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Unit 4: Wave Patterns and Information

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DESIRED RESULTS

Enduring Understandings	Essential Question(s)
<p>Waves can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).</p> <p>Digitized information can be transmitted over long distances.</p> <p>High-tech devices, such as computers or cell phones, can receive and decode information-convert it from digitized form to voice- and vice versa.</p>	<p>How do waves travel?</p> <p>How do we use patterns and waves to transmit information?</p>

Students will know (Knowledge):	Students will be able to (Skills):
<ul style="list-style-type: none">• Key concepts and vocabulary associated with wave patterns and information, including: amplitude, frequency, medium, pitch, sound, wave, volume, wavelength, echo, echolocation, binary code, coding• That sound and seismic waves transfer energy through matter and travel outward from their source• How frequency and pitch are related• How amplitude and volume are related• Ways information is sent and received• What causes an echo• How echolocation and sonar are similar• How different animals use sound to find food and to navigate• Ways throughout history that humans have developed to communicate information, including: telegraphs, radio, telephones, computers, cell phones, satellites	<ul style="list-style-type: none">• Use key concepts and vocabulary associated with wave patterns and information in discussions, inquiry activities, and performance tasks• Generate and record ideas about how waves move and how information travels• Formulate questions about waves and computer code• Discover what is needed to make sound• Explore how the produced sound can be changed• Investigate how sound travels through each of the three states of matter• Use a model to show patterns of amplitude and wavelength• Describe how the waves cause objects to move• Explore how sound can be used to transmit information about location• Construct a simple circuit to send Morse code messages• Research binary code to investigate how to decode a message• Calculate the distance an echo has traveled in order to understand how sonar and echolocation work• Design a solution to an information transfer problem

Unit 4: Wave Patterns and Information

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Students will know (Knowledge):	Students will be able to (Skills):
	<ul style="list-style-type: none">• Using various materials, build and test a string telephone that can send a message up to 10 meters