

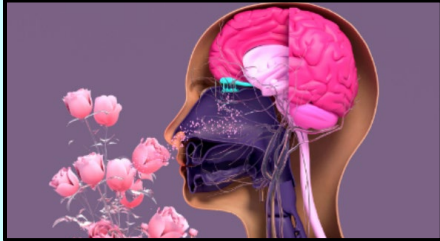




Harford County Public Schools - GRADE 4 Science Curriculum

Next Generation Science Standards (NGSS)

Access Grade Level Standards by clicking on Unit Titles below:

	Quarters 1-2 Earth Space Science	Quarters 2-3 Physical Science	Quarters 3-4 Life Science
Unit Title & Standards	 <p><u>Earth: Features and Processes</u> <i>(Earth Systems: Processes that Shape the Earth)</i></p>	 <p><u>Energy & Waves and Information</u> <i>(Energy, Wave Properties & Information)</i></p>	 <p><u>Life: Structures and Senses</u> <i>(Structure & Processes: Structure, Function & Information Processing)</i></p>
Unit Overview & Essential Question	<p>The Grade 4 Earth Space Science Unit focuses on how the processes of the Earth have changed over time and the layers of the Earth have preserved the history of the Earth for us to learn from and understand. Students will develop an understanding of the effects of weathering and the rate of erosion by water, ice, wind, and/or vegetation. They will apply their knowledge of natural Earth processes to generate and compare multiple solutions to reduce the impacts of such processes on humans. Students will also analyze and interpret data from maps to describe patterns of Earth's features.</p> <p><i>Unit Essential Question:</i> <i>How does Earth's changing landscape help us infer the history of the Earth? How can we reduce the impact of natural Earth processes?</i></p>	<p>The Grade 4 Physical Science Unit focuses on how energy can be transferred from place to place by sound, light, heat, and electric currents or from object to object through collisions. The relationship between the speed of an object and the energy of that object will be explained scientifically and applied to the understanding of energy to design, test, and refine a device that converts energy from one form to another. Waves will be described in models, as patterns of waves in terms of amplitude and wavelength, and waves can cause objects to move.</p> <p><i>Unit Essential Questions:</i> <i>How is energy related to motion and change? What are waves?</i></p>	<p>The Grade 4 Life Science Unit focuses on how organisms (plants and animals) use their external and internal structures to survive, grow, behave, and reproduce. Humans can design models and technologies that mimic how an object can be seen when light reflected from its surface enters the eye.</p> <p><i>Unit Essential Question:</i> <i>How are structure and function related to enable plant and animal survival?</i></p>

Lesson Experience Topics

Experience 1: Earth History & Earth Processes

– The Earth’s landscape has changed over time. Plate tectonics, the rock cycle, and the location of fossils in layers of rock teach us about the history of the earth.

Experience 2: Erosion and Weathering

– Water, ice, and wind change Earth’s landscape either quickly or slowly through weathering and erosion.

Experience 3: Analyzing & Interpreting Data

– **Volcanoes and Earthquakes** – Natural forces like earthquakes and volcanoes change the Earth’s landscape. Engineers solve problems using their science knowledge of earthquakes and volcanoes with their expertise in the engineering design process to design solutions to reduce the impact of natural hazards to protect humans and the environment.

Experience 1: Energy – Energy can be transferred from place to place by sound, light, heat, and electrical current.

Experience 2: Waves – Waves are regular patterns of motion in which information is transmitted. Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).

Experience 3: Energy Transfer and Collisions

– Energy is present whenever there are moving objects, sound, light, or heat; the faster a given object is moving, the more energy it possesses. When objects collide, energy can be transferred from one object to another, thereby changing their motion. When objects collide, the contact forces transfer energy to change the objects’ motions.

Experience 4: Engineering Design Challenge

– **Wind Turbines** – Engineers solve problems using their science knowledge of energy and waves with their expertise in the engineering design process to design a wind turbine.

Experience 1: Internal External Structures of Organisms

– Plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Experience 2: Animal Senses – Eyes/Sight

– Animals use their senses to process information in their brain and respond to the information in different ways. Some responses are instinctive, and animals can use their perceptions and memories to guide their actions.

Experience 3: Engineering Design Challenge – Model of the Eye

– An object can be seen when light reflected from its surface enters the eyes. Light traveling from the object to the eye determines what is seen. Engineers can design models to show how the human eye works similarly to a periscope.