

Boone County 6th Grade Science Curriculum Map

Unit 1: Forces and Interactions	Duration:
<i>Key Essential Questions:</i>	
<ul style="list-style-type: none"> ● How does the force on an object change the motion of the object? ● What are the relationships between force, mass, and motion? 	
<i>Transfer Goals:</i>	
<i>Students will be able to use their learning to</i>	
<ul style="list-style-type: none"> ● Design a solution to a problem [that uses the principles of Newton’s 3rd law.] ● Create a model that represents [a system of moving objects] ● Plan a complex investigation of [the relationships between force, mass and motion] 	
Performance Expectation	
06-PS2-1. Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.*	
06-PS2-2. Plan an investigation to provide evidence that the change in an object’s motion depends on the sum of the forces on the object and the mass of the object.	
MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	
Notes:	

Unit 2: Structure and Properties of Matter	Duration:
<i>Key Essential Questions:</i>	
<ul style="list-style-type: none"> ● How are pure substances made, and what makes them unique? ● How do motion and spatial relationships vary between solids, liquids and gases? ● How are new substances created in a chemical reaction? 	

- How does changing thermal energy effect particle motion, temperature and state?

Transfer Goals:

Students will be able to use their learning to

- Model [the atomic composition of simple molecules and extended structures.]
- Develop an explanation of how [synthetic materials are created from natural resources and the impact they have on society.]
- Develop a model that describes [the impact of thermal energy on matter.]

Performance Expectation

06-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.

06-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

06-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

Notes:

Unit 3: Earth Systems

Duration:

Key Essential Questions:

- What are the patterns and relationships within the earth-sun-moon system that create phenomena such as, phases, eclipses, seasons, etc.?
- What is the impact of gravity on individual bodies, our solar system and the galaxies?
- How has the data provided by technology, impacted understanding of the scale of, and relationships between, objects in the solar system?
- How can we generate data to test things we design?

Transfer Goals:

Students will be able to use their learning to

- Develop and use a model [of the Earth-sun-moon system] that uses patterns to reveal cause and effect relationships [which create phases, eclipses and seasons.]

<ul style="list-style-type: none"> • Develop and use a model [to describe the impact of gravity on solar systems and galaxies.] • Analyze and interpret data [from earth and space based instruments] to evaluate [scale relationships of objects in solar system and their features.]
Performance Expectation
06-ESS1-1. Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
06-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
06-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.
MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
Notes:

Unit 4: Weather and Climate	Duration:
<i>Key Essential Questions:</i>	
<ul style="list-style-type: none"> • How does water move through the earth, and what makes it move? • How does the movement of water and air effect local weather patterns? • How do the sun and the earth interact to create regional climates? 	
<i>Transfer Goals:</i>	
<i>Students will be able to use their learning to</i>	
<ul style="list-style-type: none"> • Develop a model demonstrating [the force of gravity and solar energy in the cycling of water.] • Use data to show [how air mass movement and interactions cause changes in weather conditions.] • Develop and use a model to describe [how earth’s rotation and unequal heating ultimately creates regional climates.] • Students will be able to evaluate competing design solutions using agreed upon design criteria [to evaluate models of weather phenomena.] 	

Performance Expectation
06-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
06-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
06-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
Notes:

Unit 5: Geological Processes and History of Earth	Duration:
<i>Key Essential Questions:</i>	
<ul style="list-style-type: none"> ● How do matter and energy cycle through the earth, what drives this cycling, and how does it affect living organisms and nonorganic material? ● What are the forces causing water to cycle through earth's surface and how do these forces affect water's physical state and movement? 	
<i>Transfer Goals:</i>	
<i>Students will be able to use their learning to</i>	
<ul style="list-style-type: none"> ● Describe [how Earth's materials are part of a cycle driven by the flow of energy.] ● Use evidence to explain [how geoscience processes have changed Earth's surface.] ● Provide evidence [of past plate motions] by analyzing and interpreting data [on fossils, rocks, continental shapes and seafloor structures.] ● Use data obtained from testing design solutions, to evaluate the best characteristics of each design, and combine them to construct the best solution. 	
Performance Expectation	
06-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	
06-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	

06-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

Notes:

Unit 6: Matter and Energy in Organisms and Ecosystems

Duration:

Key Essential Questions:

- How are populations and organisms impacted by their environment?
- How does competition for food, water, oxygen and other resources affect the growth and reproduction of organisms and populations?
- How does access to resources impact the growth of organisms and populations?
- How are matter and energy cycled through an ecosystem?

Transfer Goals:

Students will be able to use their learning to

- Use data as evidence [to determine the impact of resource availability on organisms and populations in ecosystems]
- Explain and predict the patterns of interactions [among organisms across multiple ecosystems]
- Develop a model to describe [the cycling of matter and energy within an ecosystem]

Performance Expectation

0.6-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem

06-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

06-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

Notes: