



## **Grade 4 Science Curriculum**

*Last Updated May, 2021 by Alyssa Raifsnider*

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<b>Unit #/Title</b>	1/Water and Weather	<b>Time Frame</b>	9 weeks
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## Stage 1 - Identify Desired Results

### Standards

- 3.3.1.A5** Become familiar with weather instruments. Collect, describe, and record basic information about weather over time.
- 3.3.4.A4** Recognize Earth's different water resources, including both fresh and saltwater. Describe phase changes in the forms of water on Earth.
- 3.3.4.A5** Describe basic weather elements. Identify weather patterns over time.
- 3.3.4.A6** Models/Scale: Identify basic landforms using models and simple maps. Constancy/Change: Identify simple changes in the earth system as air, water, soil and rock interact. Scale: Explain how basic weather elements are measured.
- 3.4.4.A1** Understand that tools, materials, and skills are used to make things and carry out tasks.
- 3.4.4.A2** Understand that systems have parts and components that work together.
- 4.2.K.A** Identify components of a water cycle.
- 4.2.K.B** Differentiate between terrestrial, aquatic, and wetland ecosystems in PA.
- 4.2.K.C** Identify that there are living and nonliving components in an aquatic habitat.
- 4.2.4.A** Describe the physical characteristics of a watershed. Identify and explain what determines the boundaries of a watershed. Identify water systems and their components as either lotic or lentic.
- 4.2.4.B** Describe the characteristics of different types of wetlands.
- 4.2.4.C** Explain how freshwater organisms are adapted to their environment. Explain the life cycles of organisms in a freshwater environment.
- 4.2.5.B** Identify important wetlands in the United States.

### Big Ideas

- Water is the most important resource for supporting life on Earth.

### Essential Questions

- What causes the great variation of Earth's weather?
- What is the evidence that the Earth's weather changes?

### Content

- Measurement devices: barometers, anemometers, thermometers, and rain gauges
- Water cycle
- Lentic and lotic systems
- Watersheds and wetlands
- Cloud types: cirrus, cumulus, stratus, and cumulonimbus
- Use of weather maps
- Terrestrial ecosystems in PA
- Aquatic ecosystems in PA
- Chesapeake Bay Wetlands System

### Skills

- Identify the 4 parts of the water cycle
- Explain the process of how water moves through a cycle
- Differentiate between lentic and lotic systems
- Explain how water enters and exits a watershed
- Explain how freshwater organisms are adapted to their environment
- Identify various cloud types
- Use clouds to predict temperature and precipitation
- Identify weather instruments
- Use weather instruments to measure temperature, precipitation, wind direction, wind speed, and air pressure
- Use a weather map to identify precipitation, fronts, and temperature

<b>Unit #/Title</b>	2/Matter and Energy	<b>Time Frame</b>	9 Weeks
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## Stage 1 - Identify Desired Results

### Standards

- 3.2.1.B1** Demonstrate various types of motion. Observe and describe how pushes and pulls change the motion of objects.
- 3.2.3.B3** Explore temperature changes that result from the addition or removal of heat.
- 3.2.4.A1.** Identify and classify objects based on their observable and measurable physical properties. Compare and contrast solids, liquids, and gases based on their properties.
- 3.2.4.A2.** Demonstrate that materials are composed of parts that are too small to be seen without magnification.
- 3.2.4.A3.** Demonstrate the conservation of mass during physical changes such as melting or freezing.
- 3.2.4.A4.** Recognize that combining two or more substances may make new materials with different properties.
- 3.2.4.A5.** Models Use models to demonstrate the physical change as water goes from liquid to ice and from liquid to vapor.
- 3.2.4.B1.** Explain how an object's change in motion can be observed and measured.
- 3.2.4.B2.** Identify types of energy and their ability to be stored and changed from one form to another.
- 3.2.4.B6.** Energy Give examples of how energy can be transformed from one form to another.
- 3.4.3.B4** Illustrate how people have made tools to provide food, clothing, and shelter.
- 3.4.4.A1.** Understand that tools, materials, and skills are used to make things and carry out tasks.
- 3.4.4.A2.** Understand that systems have parts and components that work together.
- 3.4.4.C3.** Explain how asking questions and making observations help a person understand how things work and can be repaired.
- 3.4.4.D2.** Recognize and use everyday symbols (e.g. icons, simple electrical symbols measurement) to communicate key ideas. Identify and use simple hand tools (e.g., hammer, scale) correctly and safely.
- 3.4.4.E3.** Identify types of energy and the importance of energy conservation.
- 4.1.3.C** Identify sources of energy

### Big Ideas

- Matter has observable and measurable physical properties.
- A force is required to change an object's speed or direction.
- Energy exists in many forms and can be changed from one form to another as it moves through a system.

### Essential Questions

- How can physical properties be used to describe matter?
- How does energy change from one form to another as it moves through a system?

### Content

- Physical properties of matter, matter as a mixture or solution, changes in matter
- Meter, gram, liter
- Types of motion
- Changes in motion
- Forms of energy: electrical, mechanical, and chemical

### Skills

- Recognize that all objects and materials in the world are made of matter
- Differentiate between the three states of matter
- Use physical properties to describe matter
- Observe and record change by using time and measurement
- Observe and describe the change to objects caused by temperature change or light
- Describe relative size, distance, or motion
- Describe changes in motion caused by forces
- Compare the relative movement of objects or describe types of motion that are evident

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|  | <ul style="list-style-type: none"><li>• Identify energy forms, energy transfer, and examples</li><li>• Describe the flow of energy through an object or system</li></ul> |
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<b>Unit #/Title</b>	3/Electricity and Magnetism	<b>Time Frame</b>	6 Weeks
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## Stage 1 - Identify Desired Results

### Standards

- 3.2.4.B2.** Identify types of energy and their ability to be stored and changed from one form to another.
- 3.2.4.B3.** Understand that objects that emit light often emit heat.
- 3.2.4.B4.** Apply knowledge of basic electrical circuits to the design and construction of simple direct current circuits. Compare and contrast series and parallel circuits. Demonstrate that magnets have poles that repel and attract each other.
- 3.4.4.A1.** Understand that tools, materials, and skills are used to make things and carry out tasks.
- 3.4.4.A2.** Understand that systems have parts and components that work together.
- 3.4.4.C3.** Explain how asking questions and making observations help a person understand how things work and can be repaired.
- 3.4.4.D1.** Investigate how things are made and how they can be improved.
- 3.4.4.E3.** Identify types of energy and the importance of energy conservation.

### Big Ideas

- Magnets and electricity are related.

### Essential Questions

- How can one explain and predict interactions between objects within systems?
- How is energy transferred and conserved?

### Content

- Magnetism and conductivity
- A battery enables the flow of energy
- 2 types of simple circuits: series and parallel
- Magnets have poles that repel and attract each other
- Electromagnets

### Skills

- Create light by designing series and parallel circuits using a battery as an energy source
- Compare and contrast series and parallel circuits
- Demonstrate that magnets have poles that repel and attract each other
- Demonstrate how electromagnets can be made and used

<b>Unit #/Title</b>	4/Light and Sound	<b>Time Frame</b>	8 Weeks
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## Stage 1 - Identify Desired Results

### Standards

- 3.2.4.B3.** Understand that objects that emit light often emit heat.
- 3.2.4.B5.** Demonstrate how vibrating objects make sound and sound can make things vibrate. Demonstrate how light can be reflected, refracted, or absorbed by an object.
- 3.4.4.A1.** Understand that tools, materials, and skills are used to make things and carry out tasks.
- 3.4.4.A2.** Understand that systems have parts and components that work together.
- 3.4.4.C3.** Explain how asking questions and making observations help a person understand how things work and can be repaired.
- 3.4.4.D1.** Investigate how things are made and how they can be improved.
- 3.4.4.E4.** Explain how information and communication systems allow information to be transferred from human to human.

<b>Big Ideas</b>	<b>Essential Questions</b>
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| <ul style="list-style-type: none"> <li>• Sound and light are forms of energy.</li> </ul> | <ul style="list-style-type: none"> <li>• How is energy transferred and conserved?</li> <li>• How are waves used to transfer energy and information?</li> </ul> |
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<b>Content</b>	<b>Skills</b>
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| <ul style="list-style-type: none"> <li>• Light waves</li> <li>• Light energy</li> <li>• How light travels</li> <li>• White objects reflect light and black objects absorb light</li> <li>• How sounds are made, where they originate, and how they travel</li> <li>• When matter vibrates quickly, a high-pitched sound occurs and when matter vibrates slowly, a low-pitched sound occurs</li> <li>• Volume</li> </ul> | <ul style="list-style-type: none"> <li>• Compare and contrast how light travels through different materials</li> <li>• Explore how mirrors and prisms can be used to redirect a light beam</li> <li>• Demonstrate how light can be reflected, refracted, or absorbed by an object</li> <li>• Understand that objects that emit light often emit heat</li> <li>• Compare the characteristics of sound as it is transmitted through different materials</li> <li>• Demonstrate how vibrating objects make sound and sound can make things vibrate</li> <li>• Relate the rate of vibration to the pitch of sound</li> </ul> |
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