

# 4th Grade Science



## Prioritized Standards and Instructional Units 2022-2023

## 4th Grade Science

<b>UNIT 1: Energy 40 Days</b>	<b>UNIT 2: Waves 15 Days</b>
<p style="text-align: center;"><b><u>PRIORITY</u></b></p> <p style="text-align: center;"><b><u>Science and Engineering Practices</u></b></p> <p><b>Asking Questions and Defining Problems</b></p> <ul style="list-style-type: none"><li>• Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. (4-PS3-3)</li></ul> <p><b>Planning and Carrying Out Investigations</b></p> <ul style="list-style-type: none"><li>• Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (4-PS3-2)</li></ul> <p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"><li>• Use evidence (e.g., measurements, observations, patterns) to construct an explanation. (4-PS3-1)</li><li>• Apply scientific ideas to solve design problems. (4-PS3-4)</li></ul> <p><b>Obtaining, Evaluating, and Communicating Information</b></p> <ul style="list-style-type: none"><li>• Obtain and combine information from books and other reliable media to explain phenomena. (4-ESS3-1)</li></ul> <p style="text-align: center;"><b><u>SUPPORTING</u></b></p> <p style="text-align: center;"><b><u>Performance Expectations</u></b></p> <p><b>4-PS3-1.</b> Use evidence to construct an explanation relating the speed of an object to the energy of that object.</p> <p><b>4-PS3-2.</b> Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.</p> <p><b>4-PS3-3.</b> Ask questions and predict outcomes about the changes in energy that occur when objects collide.</p> <p><b>4-PS3-4.</b> Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.</p> <p><b>4-ESS3-1.</b> Obtain and combine information to describe that energy and fuels are derived from natural resources and that their uses affect the environment.</p>	<p style="text-align: center;"><b><u>PRIORITY</u></b></p> <p style="text-align: center;"><b><u>Science and Engineering Practices</u></b></p> <p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"><li>• Develop a model using an analogy, example, or abstract representation to describe a scientific principle. (4-PS4-1)</li></ul> <p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"><li>• Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. (4-PS4-3)</li></ul> <p style="text-align: center;"><b><u>SUPPORTING</u></b></p> <p style="text-align: center;"><b><u>Performance Expectations</u></b></p> <p><b>4-PS4-1.</b> Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.</p> <p><b>4-PS4-2.</b> Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.</p> <p><b>4-PS4-3.</b> Generate and compare multiple solutions that use patterns to transfer information.</p>

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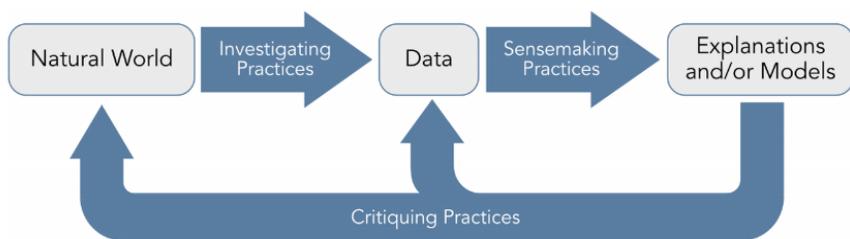
<b>UNIT 3:</b> <b>Earth's Systems: Processes that Shape the Earth</b> 30 Days	<b>UNIT 4:</b> <b>Structure, Function, and Information Processing</b> 30 Days
<p style="text-align: center;"><b><u>PRIORITY</u></b></p> <p style="text-align: center;"><b><u>Science and Engineering Practices</u></b></p> <p><b>Planning and Carrying Out Investigations</b></p> <ul style="list-style-type: none"><li>• Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (4-ESS2-1)</li></ul> <p><b>Analyzing and Interpreting Data</b></p> <ul style="list-style-type: none"><li>• Analyze and interpret data to make sense of phenomena using logical reasoning. (4-ESS2-2)</li></ul> <p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"><li>• Identify the evidence that supports particular points in an explanation. (4-ESS1-1)</li><li>• Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. (4-ESS3-2)</li></ul> <p style="text-align: center;"><b><u>SUPPORTING</u></b></p> <p style="text-align: center;"><b><u>Performance Expectations</u></b></p> <p><b>4-ESS1-1.</b> Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.</p> <p><b>4-ESS2-1.</b> Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.</p> <p><b>4-ESS2-2.</b> Analyze and interpret data from maps to describe patterns of Earth's features.</p> <p><b>4-ESS3-2.</b> Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.</p>	<p style="text-align: center;"><b><u>PRIORITY</u></b></p> <p style="text-align: center;"><b><u>Science and Engineering Practices</u></b></p> <p><b>Developing and Using Models .</b></p> <ul style="list-style-type: none"><li>• Develop a model to describe phenomena. (4- PS4-2)</li><li>• Use a model to test interactions concerning the functioning of a natural system. (4-LS1-2)</li></ul> <p><b>Engaging in Argument from Evidence</b></p> <ul style="list-style-type: none"><li>• Construct an argument with evidence, data, and/or a model. (4-LS1-1)</li></ul> <p style="text-align: center;"><b><u>SUPPORTING</u></b></p> <p style="text-align: center;"><b><u>Performance Expectations</u></b></p> <p><b>4-LS1-1.</b> Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</p> <p><b>4-LS1-2.</b> Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.</p> <p><b>4-PS4-2.</b> Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.</p>

Unit/Core Idea: Waves

Essential Question: How are waves used to transfer energy and information?

Supporting Questions:

- What are the characteristic properties and behaviors of waves?
- How are instruments that transmit and detect waves used to extend human senses?
- What is light?
- How can one explain the varied effects that involve light?



	Investigating Practices	Sensemaking Practices	Critiquing Practices
	1. Asking questions	2. Developing and using models	7. Engaging in argument from evidence
Science Practices	3. Planning and carrying out investigations	4. Analyzing and interpreting data	8. Obtaining, evaluating, and communication information
	5. Using mathematical and computational thinking	6. Constructing explanations	

Scientific Practices (Priority)

**Developing and Using Models**

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

- Develop a model using an analogy, example, or abstract representation to describe a scientific principle. (4-PS4-1)

**Constructing Explanations and Designing Solutions**

Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

- Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. (4-PS4-3)

Performance Expectations (Supporting)

**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.**

[Clarification Statement: Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves.] [Assessment Boundary: Assessment does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.]

**4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.** [Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.]

**4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.\*** [Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.]

**Kentucky Academic  
Standards Connections**

**ELA/Literacy –**

RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. (4-PS4- 3)

RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. (4-PS4-3)

SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. (4-PS4- 1)

**Mathematics –**

MP.4 Model with mathematics. (4-PS4-1)

4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two dimensional figures. (4-PS4-1)