4th Grade Science

Prioritized Standards and Instructional Units 2022-2023

4th Grade Science

UNIT 1: **Energy** 40 Days	UNIT 2: **Waves** 15 Days
PRIORITY **Science and Engineering Practices** **Asking Questions and Defining Problems** ● Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. (4-PS3-3) **Planning and Carrying Out Investigations** ● 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) **Constructing Explanations and Designing Solutions** ● Use evidence (e.g., measurements, observations, patterns) to construct an explanation. (4-PS3-1) ● Apply scientific ideas to solve design problems. (4- PS3-4) **Obtaining, Evaluating, and Communicating Information** ● Obtain and combine information from books and other reliable media to explain phenomena. (4-ESS3-1) **SUPPORTING** **Performance Expectations** **4-PS3-1.** Use evidence to construct an explanation relating the speed of an object to the energy of that object. **4-PS3-2.** Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. **4-PS3-3.** Ask questions and predict outcomes about the changes in energy that occur when objects collide. **4-PS3-4.** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. **4-ESS3-1.** Obtain and combine information to describe that energy and fuels are derived from natural resources and that their uses affect the environment.	**PRIORITY** **Science and Engineering Practices** **Developing and Using Models** ● Develop a model using an analogy, example, or abstract representation to describe a scientific principle. (4-PS4-1) **Constructing Explanations and Designing Solutions** ● 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) **SUPPORTING** **Performance Expectations** **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-PS4-2.** Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. **4-PS4-3.** Generate and compare multiple solutions that use patterns to transfer information.

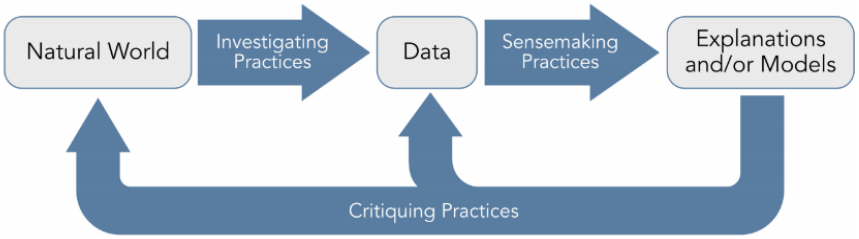
4th Grade Science

UNIT 3: Earth's Systems: Processes that Shape the Earth 30 Days	UNIT 4: Structure, Function, and Information Processing 30 Days
PRIORITY **Science and Engineering Practices** **Planning and Carrying Out Investigations** ● Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (4-ESS2-1) **Analyzing and Interpreting Data** ● Analyze and interpret data to make sense of phenomena using logical reasoning. (4-ESS2-2) **Constructing Explanations and Designing Solutions** ● Identify the evidence that supports particular points in an explanation. (4-ESS1-1) ● 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) **SUPPORTING** **Performance Expectations** **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. **4-ESS3-2.** Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	**PRIORITY** **Science and Engineering Practices** **Developing and Using Models** . ● Develop a model to describe phenomena. (4- PS4-2) ● Use a model to test interactions concerning the functioning of a natural system. (4-LS1-2) **Engaging in Argument from Evidence** ● Construct an argument with evidence, data, and/or a model. (4-LS1-1) **SUPPORTING** **Performance Expectations** **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-LS1-2.** 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. **4-PS4-2.** Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.

Unit/Core Idea: Structure, Function, and Information Processing — Pacing: 30 days

Unit/Core Idea: Structure, Function, and Information Processing
Essential Question: How do internal and external structures support the survival, growth, behavior, and reproduction of plants and animals?

Supporting Questions:
-How do the structures of organisms enable life's functions?
-How do organisms detect, process, and use information about the environment?



	Investigating Practices	Sensemaking Practices	Critiquing Practices
Science Practices	1. Asking questions	2. Developing and using models	7. Engaging in argument from evidence
	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 and Engineering Practices (Priority)	Performance Expectations (Supporting)
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 to describe phenomena. (4- PS4-2) ● Use a model to test interactions concerning the functioning of a natural system. (4-LS1-2) **Engaging in Argument from Evidence** Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ● Construct an argument with evidence, data, and/or a model. (4-LS1-1)	**4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.** [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.] **4-LS1-2. 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.** [Clarification Statement: Emphasis is on systems of information transfer.] [Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.] **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.]

Kentucky Academic Standards Connections	**ELA/Literacy –** W.4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (4-LS1-1) SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. (4-PS4-2),(4-LS1-2) **Mathematics –** MP.4 Model with mathematics. (4-PS4-2) 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-PS4-2) 4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded across the line into matching parts. Identify line symmetric figures and draw lines of symmetry. (4-LS1-1)