

6th Grade Science Curriculum

	Bundle Focus Guiding Questions	Skills
September- November	<p>Bundle 1: Systems and Subsystems in Earth and Life Science</p> <p>Guiding Questions:</p> <ul style="list-style-type: none"> • What is a system? • What is the relationship between cells and organisms within a living system? • What is the relationship between the hydrologic cycle and climate within an Earth system? • What is the value of creating a systems model? • How are living systems similar to Earth systems? • How are living systems different from Earth systems? 	<ul style="list-style-type: none"> • Students develop a model that compares the Earth's climate system and the human body system. • Conduct an investigation to provide evidence that living things are made of cells—either one cell or many different numbers and types of cells. • Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. • Use arguments supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
November- January	<p>Bundle 2: Earth System Interactions Cause Weather</p> <p>Guiding Questions:</p> <ul style="list-style-type: none"> • What is a system? • What is the relationship between cells and organisms within a living system? • What is the relationship between the hydrologic cycle and climate within an Earth system? • What is the value of creating a systems model? • How are living systems similar to Earth systems? • How are living systems different from Earth systems? 	<ul style="list-style-type: none"> • Design a portable structure that will keep athletes cool in hot climates and warm in cool climates. The structure must be easy to move between venues, and it cannot depend on electric or battery power. • 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. • Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. • Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. • 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. • Develop a model to generate data for interactive testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. • Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. • Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. • Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. • Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. • 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.

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February - April	<p>Bundle 3: Causes and Effects of Regional Climates Guiding Questions:</p> <ul style="list-style-type: none"> • Why is the climate so different in different regions of the planet? • How do people predict the weather? • Why are organisms so different in different regions of the planet? • What makes organisms so similar to but also different from their parents? • What makes animals behave the way they do, and how does their behavior affect their survival and reproduction? 	<ul style="list-style-type: none"> • Students plan a new dogsled race similar to the Iditarod but that takes place in the sand dunes of the Arabian Desert. • Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. • Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. • Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. • Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. • Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.
April- June	<p>Bundle 4: Effects of Global Warming on Living Systems Guiding Questions:</p> <ul style="list-style-type: none"> • How do human activities affect the water supply? • How are organisms impacted by changes in the water supply? • What are indicators of global climate change? • How does global climate change affect Earth's supply of available drinking water? 	<ul style="list-style-type: none"> • Address the effects of global warming on living systems by preparing an argument explaining why different groups should not have their water supply reduced and by participating in a debate with other groups to present their arguments. • Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. • Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. • 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. • 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. • Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.