



23-24 Grade 8 Science Pacing Guide

4.0 Target	3.0 Target	T1	T2	T3
Genetics: Why are living things different from one another?				
Students have multiple ways to demonstrate extension. For more information or to see a scoring rubric, contact your child's teacher.	LS1-5: ENVIRONMENTAL AND GENETIC GROWTH FACTORS - Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. (Cause and Effect) LS3-1: MUTATIONS: HARMFUL, BENEFICIAL, NEUTRAL - Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. LS3-2: ASEXUAL AND SEXUAL REPRODUCTION - 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. (Cause and Effect) LS4-5: ARTIFICIAL SELECTION - Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. (Cause and Effect)	X		
Natural Selection & Common Ancestry: How could things living today be connected to the things that lived long ago?				
Students have multiple ways to demonstrate extension. For more information or to see a scoring rubric, contact your child's teacher.	LS1-4: ANIMAL BEHAVIORS AND PLANT STRUCTURES REPRODUCTIVE SUCCESS - Use argument 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. (Cause and Effect) LS4-1: FOSSIL EVIDENCE OF COMMON ANCESTRY AND DIVERSITY - Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on earth under the assumption that natural laws operate today as in the past. LS4-2: ANATOMICAL EVIDENCE OF EVOLUTIONARY RELATIONSHIPS - Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. (Patterns) LS4-3: EMBRYOLOGICAL EVIDENCE OF COMMON ANCESTRY - Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. LS4-4: NATURAL SELECTION - Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. (Cause and Effect) LS4-6: ADAPTION OF POPULATIONS OVER TIME - Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. (Cause and Effect)	X		
Contact Forces: Why do things sometimes get damaged when they hit each other?				
Students have multiple ways to demonstrate extension. For more information or to see a scoring rubric, contact your child's teacher.	PS2-1: COLLISION DESIGN SOLUTION - Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. (Systems and System Models) PS2-2: FORCES, MASS AND THE MOTION OF AN OBJECT - 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. (Stability and Change) PS3-1: KINETIC ENERGY OF AN OBJECT - 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. (Scale, Proportion, and Quantity)"		X	
Sound Waves: How can a sound make something move?				

Students have multiple ways to demonstrate extension. For more information or to see a scoring rubric, contact your child's teacher.	<p>*PS4-1: WAVE PROPERTIES - Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. (Patterns)</p> <p>*PS4-2: WAVE REFLECTION, ABSORPTION, AND TRANSMISSION - Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (Structure and Function)</p>		X	
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Forces at a Distance:

How can a magnet move another object without touching it?

Students have multiple ways to demonstrate extension. For more information or to see a scoring rubric, contact your child's teacher.	<p>PS2-3: ELECTRIC AND MAGNETIC FORCES - Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. (Cause and Effect)</p> <p>PS2-5: ELECTRIC, MAGNETIC, AND GRAVITATIONAL FIELDS - Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. (Cause and Effect)</p> <p>PS3-2: POTENTIAL ENERGY OF THE SYSTEM - Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system. (Systems and System Models)</p>			X
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Earth in Space:

How are we connected to the patterns we see in the sky and space?

Students have multiple ways to demonstrate extension. For more information or to see a scoring rubric, contact your child's teacher.	<p>ESS1-1: EARTH-SUN-MOON SYSTEM - 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.</p> <p>ESS1-2: GRAVITY AND MOTIONS IN SPACE - Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. (Systems and System Models)</p> <p>ESS1-3: SCALE PROPERTIES IN THE SOLAR SYSTEM - Analyze and interpret data to determine scale properties of objects in the solar system. (Scale, Proportion, and Quantity)</p> <p>PS2-4: GRAVITATIONAL INTERACTIONS - Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. (Systems and System Models)</p> <p>PS4-2: WAVE REFLECTION, ABSORPTION, AND TRANSMISSION - Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (Structure and Function)</p> <p>PS4-3: DIGITIZED WAVE SIGNALS - Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals. (Structure and Function)</p>			X
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Engineering Design

Does Not Extend	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.	X	X	X
Does Not Extend	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	X	X	X
Does Not Extend	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.	X	X	X
Does Not Extend	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.	X	X	X