

Course Title:	8th Grade Science
Grade(s):	8

Course Description
This engaging, year-long 8th Grade General Science course offers a comprehensive exploration of key scientific concepts across the physical, life, and earth and space sciences, all while integrating the Next Generation Science Standards (NGSS). Students will move beyond rote memorization to actively engage in Science and Engineering Practices, utilizing Crosscutting Concepts to connect knowledge across different domains. The curriculum is structured around significant disciplinary core ideas, fostering critical thinking, problem-solving, and a deep understanding of how science and engineering impact our world.
Approved Curricular Materials/Textbook(s)
Lab Aids: Solar System and Beyond Waves Evolution Reproduction Force and Motion Engineering and Design Process

Unit Title	Unit Description (Include Unit Objectives)	Unit Pacing
Unit 1: Solar System and Beyond	By the end of this unit, students will: • 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. • Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. • Analyze and interpret data to determine scale properties of objects in the solar system.	9 weeks (September-October)

Unit 2: Physics of Waves	By the end of this unit, students will: • 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. • Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. • 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.	8 weeks (November-December)
Unit 3: Evolution	By the end of this unit, students will: • 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. • 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. • 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. • 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. • Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. • Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. • Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in	5 weeks (January-February)

	harmful, beneficial, or neutral effects to the structure and function of the organism.	
Unit 4: Reproduction	By the end of this unit, students will: • 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. • 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 an organism. • 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.	6 weeks (February-March)
Unit 5: Force and Motion	By the end of this unit, students will: • Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. • 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. • 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. • 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.	8 weeks (March- May)

Unit 6: Capstone Project- Bottle Rocket Engineering and Design	By the end of this capstone project, students will: • Define a design problem that can be solved through the development of an object, tool, process, or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. • Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. • 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.	5 weeks (May-June)
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