

Science 8 Course Overview

Unit	Major Concepts	Skills	Summative Assessments
<p>Chemical Interactions</p>	<p>All common matter on Earth is made of elements.</p> <p>Each element is represented by a unique, defining particle called an atom.</p> <p>Atoms are arranged in the periodic table by both mass and chemical characteristics.</p> <p>A kinetic particulate model can be used to explain observations of the macroscopic properties and behaviors of solids, liquids, and gasses.</p> <p>All matter consists of individual particles in constant motion.</p> <p>Energy transfers to, from, and through matter when particles collide (conduction), and always from higher-energy particles to lower-energy particles.</p> <p>Phase of matter is determined by the relationship between the particles of a mass.</p> <p>Substances react chemically in characteristic ways with other substances to form new substances with different characteristic properties.</p> <p>In chemical reactions, mass and energy are conserved.</p> <p>Products of a chemical reaction are limited by the quantities of the reactants present.</p>	<p>Choose appropriate measurement instruments and units for specific tasks.</p> <p>Measure mass, volume, and temperature of substances accurately.</p> <p>Apply a kinetic particulate model to explain the behavior of solids, liquids, and gasses at the macroscopic and particle levels, including expansion, compression, contraction, and phase change.</p> <p>Calculate energy transfer in calories.</p> <p>Calculate heat of fusion from data.</p> <p>Use atom models and chemical formulas to demonstrate how reactants rearrange during chemical reactions to form new substances.</p> <p>Work collaboratively with peers to analyze science investigations.</p> <p>Apply scientific thinking processes to conduct investigations and build explanations.</p> <p>Apply the engineering design process to evaluate and optimize design options applying knowledge of conduction, convection and radiation.</p>	<p>Lab reports and/or presentations summarizing controlled experiments</p> <p>Presenting results of independent research</p> <p>Mid-summative and Final Assessments</p> <p>Thermal Design Engineering Challenge</p>

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<p>Force and Motion</p>	<p>The motion of an object can be described by its position, direction of motion, and speed.</p> <p>Motion can be measured, calculated, and represented on a graph.</p> <p>An object that is not being subjected to a (net) force will continue to move at a constant speed.</p> <p>If more than one force acts on an object then the forces will reinforce or cancel one another, depending on their direction and magnitude.</p> <p>Unbalanced forces will change the speed or direction of an object's motion.</p> <p>Acceleration is the change in velocity of an object over time.</p>	<p>Describe an object's motion in terms of change of position.</p> <p>Apply equations to calculate linear motion and various aspects of change of position - distance, displacement, speed, velocity, and acceleration.</p> <p>Transform narrative accounts of motion events into graphic representations.</p> <p>Analyze illustrations of forces in motion. Gather, graph, and analyze data.</p> <p>Apply math skills in the context of science.</p> <p>Work collaboratively with peers to succeed and optimize design choices in NASA engineering challenges.</p>	<p>Lab reports and/or presentations summarizing controlled experiments</p> <p>Presenting results of independent research</p> <p>Quizzes</p> <p>Mid-summative and Final Exams</p> <p>Engineering Design Challenges</p>
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<p>Planetary Science</p>	<p>All perceptions of motion are relative to the observer's frame of reference.</p> <p>Scale is the size relationship between a representation of an object and the object.</p> <p>The Moon shines as a result of reflected light from the Sun. Half of the Moon is always illuminated (except during a lunar eclipse).</p> <p>Craters can be categorized by size and physical characteristics.</p> <p>The solar system formed during a sequence of events that started with a nebula.</p> <p>The distance between solar system objects is enormous.</p> <p>Liquid water is essential to life as we know it.</p> <p>Scientific missions provide data about the composition and environmental conditions on the planets, moons, and other bodies in the solar system.</p> <p>Planetary-system objects move in measurable and predictable patterns.</p>	<p>Compare and contrast apparent and real motion using examples and explain the role of the observer's frame of reference.</p> <p>Construct scale models of the Earth/Moon system and the solar system.</p> <p>Identify and classify major moon surface features.</p> <p>Use models of the Sun, Moon and Earth to explain the mechanics of Moon phases.</p> <p>Describe the conditions required to produce solar and lunar eclipses, and explain why they do not occur every month.</p> <p>Determine the effect of meteoroid size and speed on crater characteristics.</p> <p>Use a spectroscope to analyze light coming from different light sources.</p> <p>Work collaboratively with peers to analyze science investigations.</p> <p>Apply scientific thinking processes to conduct investigations and build explanations.</p>	<p>Lab reports and/or presentations summarizing controlled experiments</p> <p>Presenting results of independent research</p> <p>Mid-summative and Final Assessments</p> <p>Engineering Design Challenges</p>
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