

**Science Standards: 7th Grade**

**Any standard highlighted in yellow has been determined by our WUSD teachers, district and state content experts as essential for students to master.**

**Forces are push or pull interactions between two objects. Changes in motion, balance and stability, and transfers of energy are all facilitated by forces on matter. Forces, including electric, magnetic, and gravitational forces, can act on objects that are not in contact with each other. Scientists use data from many sources to examine the cause and effect relationships determined by different forces.**

Learning Targets	Academic Vocabulary	Questions Stems	Possible Assessments
<p>Carry out an investigation which provides evidence that a <u>change</u> in an object's motion is dependent on the mass of the object and the sum of the forces acting on it.</p> <p>Apply Newton's Third Law to design a solution to a <i>problem involving the motion of two colliding objects in a <u>system</u></i>.</p> <p>Construct a model using observational evidence to describe the nature of fields that exist between objects that exert forces on each other even though the objects are not in contact.</p> <p>Collect and analyze data to determine the factors that <u>affect</u> the strength of electric and magnetic forces. Examples could include electromagnets, electric motors, or generators.</p> <p>Engage in argument from evidence to support the claim that gravitational interactions within a <u>system</u> are attractive and dependent upon the masses of interacting objects.</p>	<p>Mass Motion Newton's First Law Newton's Second Law Newton's Third Law Force System</p>	<p>How does a magnet work?</p> <p>Can electricity affect a magnet's strength?</p> <p>Do objects' masses matter in a gravitational system?</p> <p>Can two objects affect each other if they are not in contact with each other?</p>	<p>Students will construct an electromagnet and demonstrate how it works.</p> <p>Students can construct and share an argument about how mass affects their interaction.</p>

<p>Earth's processes are dynamic and interactive, and are the result of energy flowing and matter cycling within and among Earth's systems. Energy from the sun and Earth's internal heat are the main sources driving these processes. Plate tectonics is a unifying theory that explains crustal movements of Earth's surface, how and where different rocks form, the occurrence of earthquakes and volcanoes, and the distribution of fossil plants and animals.</p>			
<p><b>Learning Targets</b></p> <p><b>Develop a model</b> of the rock cycle to describe the relationship between <u>energy</u> flow and <u>matter</u> cycling that create igneous, sedimentary, and metamorphic rocks. Emphasize the processes of melting, crystallization, weathering, deposition, sedimentation, and deformation, which act together to form minerals and rocks.</p> <p><b>Construct an explanation</b> based on evidence for how processes have changed Earth's surface at varying time and spatial <u>scales</u>.</p> <p><b>Ask questions</b> to <i>identify constraints</i> of specific geologic hazards and <i>evaluate competing design solutions</i> for maintaining the <u>stability</u> of human-engineered structures such as homes, roads and bridges.</p> <p><b>Develop and use a scale model</b> of the matter in Earth's interior to demonstrate how differences in density and chemical</p>	<p><b>Academic Vocabulary</b></p> <p>Igneous rock Sedimentary rock Metamorphic rock melting crystallization deformation geologic earthquake landslide flood chemical composition plate tectonics fossil fault volcano strata uniformitarianism superposition deposition sedimentation mineral</p>	<p><b>Questions Stems</b></p> <p>Why do you see different types of rocks in the world?</p> <p>How does the Earth sometimes affect human made structures?</p> <p>Why do earthquakes happen?</p> <p>What made the mountains?</p>	<p><b>Possible Assessments</b></p> <p>Students will construct a model showing plate tectonics and its effects.</p> <p>Students will identify different types of rocks and explain how they were formed.</p> <p>Students can make a model and explain how the Earth's strata helps determine the age of fossils.</p>

<p>composition (silicon, oxygen, iron, and magnesium) <u>cause</u> the formation of the crust, mantle, and core.</p> <p><b>Ask questions and analyze and interpret data</b> about the <u>patterns</u> between plate tectonics and: 1) The occurrence of earthquakes and volcanoes. 2) Continental and ocean floor features. 3) The distribution of rocks and fossils.</p> <p><b>Make an argument from evidence</b> for how the geologic time <u>scale</u> shows the age and history of Earth.</p>			
<p>Living things are made of smaller structures, which function to meet the needs of survival. The basic structural unit of all living things is the cell. Parts of a cell work together to function as a system. Cells work together and form tissues, organs, and organ systems. Organ systems interact to meet the needs of the organism.</p>			
<p><b>Learning Targets</b></p> <p>Plan and carry out an investigation that provides evidence that the basic <u>structures</u> of living things are cells. Emphasize that cells can form single-celled or multicellular organisms and that multicellular organisms are made of different types of cells.</p> <p>Develop and use a model to describe the <u>function</u> of a cell in living systems and the way parts of cells contribute to cell function. Emphasize the cell as a system, including the interrelating roles of the nucleus, chloroplasts, mitochondria, cell</p>	<p><b>Academic Vocabulary</b></p> <p>Cell Theory Cell Single-celled Multicellular Organelle Nucleus Chloroplast Mitochondria Cell membrane Cell wall Levels of organization Tissue</p>	<p><b>Questions Stems</b></p> <p>What allows large organisms to be so complex?</p> <p>What benefits do multicellular organisms have over single-celled organisms?</p> <p>What would happen to a cell if an organelle stopped working?</p>	<p><b>Possible Assessments</b></p> <p>Students will make a model of the levels of organization.</p> <p>Students will produce arguments for each part of the Cell Theory</p>

<p>membrane, and cell wall.</p> <p>Construct an explanation using evidence to explain how body systems have various levels of organization. Emphasize understanding that cells form tissues, tissues form organs, and organs form systems specialized for particular body <u>functions</u>.</p>	<p>Organ Organ System Organism</p>		
<p>The great diversity of species on Earth is a result of genetic variation. Genetic traits are passed from parent to offspring. These traits affect the structure and behavior of organisms, which affect the organism's ability to survive and reproduce. Mutations can cause changes in traits that may affect an organism. As technology has developed, humans have been able to change the inherited traits in organisms which may impact society.</p>			
<p><b>Learning Targets</b></p> <p>Develop and use a model to explain the <u>effect</u> that different types of reproduction have on genetic variation, including asexual and sexual reproduction.</p> <p>Obtain, evaluate, and communicate information about specific animal and plant adaptations and <u>structures</u> that affect the probability of successful reproduction.</p> <p>Develop and use a model to describe why genetic mutations may result in harmful, beneficial, or neutral effects to the <u>structure</u></p>	<p><b>Academic Vocabulary</b></p> <p>Asexual Sexual Adaptations Mutation Diversity Selective Breeding</p>	<p><b>Questions Stems</b></p> <p>How can you differentiate asexual and sexual reproduction?</p> <p>What benefits are there with having genetic variation?</p> <p>How do adaptations help organisms be able to reproduce?</p>	<p><b>Possible Assessments</b></p> <p>T chart with organisms and their reproduction type.</p> <p>Effects of an organism in a specific environment.</p> <p>Write an argumentative essay of how mutations affect life.</p> <p>Applying how farmers and ranchers can utilize genetic knowledge to benefit them.</p>

<p><u>and function</u> of the organism.</p> <p>Obtain, evaluate, and communicate information about the technologies that have changed the way humans <u>affect</u> the inheritance of desired traits in organisms.</p>			
<p>Genetic variation and the proportion of traits within a population can change over time. These changes can result in evolution through natural selection. Additional evidence of change over time can be found in the fossil record, anatomical similarities and differences between modern and ancient organisms, and embryological development.</p>			
<p><b>Learning Targets</b></p> <p>Construct an explanation that describes how the genetic variation of traits in a population can <u>affect</u> some individuals' probability of surviving and reproducing in a specific environment. Over time, specific traits may increase or decrease in populations. Emphasize the use of proportional reasoning to support explanations of trends in changes to populations over time. Examples could include camouflage, variation of body shape, speed and agility, or drought tolerance.</p> <p>Analyze and interpret data for <u>patterns</u> in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth, under the</p>	<p><b>Academic Vocabulary</b></p> <p>Traits Variation Population Community Camouflage Diversity Extinction Fossil Record Embryologic</p>	<p><b>Questions Stems</b></p> <p>Which organisms in a population are going to survive the best?</p> <p>How do the Peppered Moths show trait frequency changes over time?</p> <p>What are some things that we can learn from the Fossil Records?</p> <p>What can we learn from the embryonic development of different organisms?</p>	<p><b>Possible Assessments</b></p> <p>Students will be given an organism with stated traits and design an environment to fit their traits. (or vise versa)</p> <p>Students will make a model showing Fossil Records and what we learn from them.</p> <p>Discover solutions to an ecological situation where a non native species has been introduced.</p>

<p>assumption that natural laws operate today as in the past.</p> <p>Construct explanations that describe the <u>patterns</u> of body structure similarities and differences between modern organisms, and between ancient and modern organisms, to infer possible evolutionary relationships.</p> <p>Analyze data to compare <u>patterns</u> in the embryological development across multiple species to identify similarities and differences not evident in the fully formed anatomy.</p>			
--	--	--	--

