

SEVENTH GRADE STANDARDS

Standard	Conceptual Strand	Guiding Question	Grade Level Expectations	Checks for Understanding	State Performance Indicators
1. Cells	All living things are made of cells that perform functions necessary for life.	How are plant and animal cells organized to carry on the processes of life?	<ol style="list-style-type: none"> 1. Make observations and describe the structure and function of organelles found in plant and animal cells. 2. Summarize how the different levels of organization are integrated within living systems. 3. Describe the function of different organ systems and how collectively they enable complex multicellular organisms to survive. 4. Illustrate how cell division occurs in sequential stages to maintain the chromosome number of a species. 5. Observe and explain how materials move through simple diffusion. 	<ol style="list-style-type: none"> 1. Examine and describe plant and animal cells using compound microscopes. 2. Identify the function of the major plant and animal cellular organelles. 3. Make a Venn diagram to compare the structures and functions of an animal cell with a plant cell. 4. Build a 3-D model of a cell. 5. Construct a poster that illustrates the hierarchy among cells, tissues, organs, organ systems, and organisms. 6. Describe the function of different organ systems. 7. Explain how different organ systems interact to enable complex multicellular organisms to survive. 8. Apply the idea of the division of labor to explain why living things are organized into cells, tissues, organs, and organ systems. 9. Model the movement of chromosomes during plant cell division. 10. Design a demonstration that illustrates how materials move across a semi-permeable membrane by simple diffusion. 	<ol style="list-style-type: none"> 1. Identify and describe the function of the major plant and animal cell organelles. 2. Interpret a chart to explain the integrated relationships that exist among cells, tissues, organs, and organ systems. 3. Explain the basic functions of a major organ system. 4. Sequence a series of diagrams that depict chromosome movement during plant cell division. 5. Explain how materials move through simple diffusion.
3. Flow of Matter & Energy	Matter and energy flow through the biosphere.	What scientific information explains how matter and energy flow through the biosphere?	<ol style="list-style-type: none"> 1. Distinguish between the basic features of photosynthesis and respiration. 2. Investigate the exchange of oxygen and carbon dioxide between living things and the environment. 	<ol style="list-style-type: none"> 1. Associate the fundamental processes of photosynthesis and respiration with appropriate cell structures. 2. Examine and identify the chloroplasts in a leaf cell. 3. Identify the materials used by plants to make food. 4. Create a chart that compares the reactants and products of photosynthesis and respiration. 5. Model the pathways of water, oxygen, and carbon dioxide through a plant. 6. Describe the movement of oxygen and carbon dioxide between living things and the environment. 7. Describe structures that animals use to obtain oxygen. 	<ol style="list-style-type: none"> 1. Compare the chemical compounds that make up the reactants and products of photosynthesis and respiration. 2. Interpret a diagram to explain how oxygen and carbon dioxide are exchanged between living things and the environment.
4. Heredity	Plants and animals reproduce and transmit hereditary information between generations.	What are the principal mechanisms by which living things reproduce and transmit information between parents and offspring?	<ol style="list-style-type: none"> 1. Compare and contrast the fundamental features of sexual and asexual reproduction. 2. Demonstrate an understanding of sexual reproduction in flowering plants. 3. Explain the relationship among genes, chromosomes, and inherited traits. 4. Predict the probable appearance of offspring based on the genetic characteristics of the parents. 	<ol style="list-style-type: none"> 1. Classify organisms according to whether they reproduce sexually or asexually. 2. Label and explain the function of the reproductive parts of a flower. 3. Describe various methods of plant pollination. 4. Investigate the relationship among DNA, genes, and chromosomes. 5. Explain the differences between dominant and recessive traits. 6. Use a Punnett square to predict the genotypes of offspring resulting from a monohybrid cross. 7. Draw a phenotypically accurate picture of an individual whose traits are modeled by the role of a die. 	<ol style="list-style-type: none"> 1. Classify methods of reproduction as sexual or asexual. 2. Match flower parts with their reproductive functions. 3. Describe the relationship among genes, chromosomes, and inherited traits. 4. Interpret a Punnett square to predict possible genetic combinations passed from parents to offspring during sexual reproduction.
7. The Earth	Major geologic events that occur over eons or brief moments in time continually shape and reshape the surface of the Earth, resulting in continuous global change.	How is the earth affected by long-term and short term geological cycles and the influence of man?	<ol style="list-style-type: none"> 1. Describe the physical properties of minerals. 2. Summarize the basic events that occur during the rock cycle. 3. Analyze the characteristics of the earth's layers and the location of the major plates. 4. Explain how earthquakes, mountain building, volcanoes, and sea floor spreading are associated with movements of the earth's major plates. 5. Differentiate between renewable and nonrenewable resources in terms of their use by man. 6. Evaluate how human activities affect the earth's land, oceans, and atmosphere. 	<ol style="list-style-type: none"> 1. Organize and explain information about the properties of minerals and their uses. 2. Label a diagram that depicts the major processes of the rock cycle. 3. Distinguish among sedimentary, igneous, and metamorphic rocks and relate these to a simple diagram of the rock cycle. 4. Recognize that the earth's layers have different thickness, states of matter, densities, and chemical makeup. 5. Analyze the relationship between plate movements and areas of earthquake activity. 6. Analyze the relationship between plate movements and mountain building. 7. Analyze the relationship between plate movements, volcanoes, and sea floor spreading. 8. Determine the impact of man's use of renewable and nonrenewable resources on future supplies. 9. Evaluate how human activities affect the condition of the earth's land, water, and atmosphere. 	<ol style="list-style-type: none"> 1. Use a table of physical properties to classify minerals. 2. Label a diagram that depicts the three different rock types. 3. Identify the major processes that drive the rock cycle. 4. Differentiate among the characteristics of the earth's three layers. 5. Recognize that lithospheric plates on the scale of continents and oceans continually move at rates of centimeters per year. 6. Describe the relationship between plate movements and earthquakes, mountain building, volcanoes, and sea floor spreading. 7. Analyze and evaluate the impact of man's use of earth's land, water, and atmospheric resources.
1.1. Motion	Objects move in ways that can be observed, described, predicted, and measured.	What causes objects to move differently under different circumstances?	<ol style="list-style-type: none"> 1. Identify six types of simple machines. 2. Apply the equation for work in experiments with simple machines to determine the amount of force needed to do work. 3. Distinguish between speed and velocity. 4. Investigate how Newton's laws of motion explain an object's movement. 5. Compare and contrast the basic parts of a wave. 6. Investigate the types and fundamental properties of waves. 	<ol style="list-style-type: none"> 1. Compare the six types of simple machines. 2. Compete an investigation to determine how machines reduce the amount of force needed to do work. 3. Summarize the difference between the speed and velocity based on the distance and amount of time traveled. 4. Recognize how a net force impacts an object's motion. 5. Create a graphic organizer to illustrate and describe the basic parts of a wave. 6. Compare how transverse and longitudinal waves are produced and transmitted. 	<ol style="list-style-type: none"> 1. Differentiate between the six simple machines. 2. Determine the amount of force needed to do work using different simple machines. 3. Apply proper equations to solve basic problems pertaining to distance, time, speed, and velocity. 4. Identify and explain how Newton's laws of motion relate to the movement of objects. 5. Compare and contrast the different parts of a wave. 6. Differentiate between transverse and longitudinal waves in terms of how they are produced and transmitted.
Embedded Inquiry	Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21st century.	What tools, skills, knowledge, and dispositions are needed to conduct scientific inquiry?	<ol style="list-style-type: none"> 1. Design and conduct open-ended scientific investigations. 2. Use appropriate tools and techniques to gather, organize, analyze, and interpret data. 3. Synthesize information to determine cause and effect relationships between evidence and explanations. 4. Recognize possible sources of bias and error, alternative explanations, and questions for further exploration. 5. Communicate scientific understanding using descriptions, explanations, and models 	<ol style="list-style-type: none"> 1. Design and conduct an open-ended scientific investigation to answer a question that includes a control and appropriate variables. 2. Identify tools and techniques needed to gather, organize, analyze, and interpret data collected from a moderately complex scientific investigation. 3. Use evidence from a dataset to determine cause and effect relationships that explain a phenomenon. 4. Review an experimental design to determine possible sources of bias or error, state alternative explanations, and identify questions 	<ol style="list-style-type: none"> 1. Design a simple experimental procedure with an identified control and appropriate variables. 2. Select tools and procedures needed to conduct a moderately complex experiment. 3. Interpret and translate data in a table, graph, or diagram. 4. Draw a conclusion that establishes a cause and effect relationship supported by evidence. 5. Identify a faulty interpretation of data that is due to bias or experimental error.
Embedded Technology and Engineering	Society benefits when engineers apply scientific discoveries to design materials and processes that develop into enabling technologies.	How do science concepts, engineering skills, and applications of technology improve the quality of life?	<ol style="list-style-type: none"> 1. Explore how technology responds to social, political, and economic needs. 2. Know that the engineering design process involves an ongoing series of events that incorporates design constraints, model building, testing, evaluating, modifying, and retesting. 3. Compare the intended benefits with the unintended consequences of a new technology. 4. Describe and explain adaptive and assistive bioengineered products. 	<ol style="list-style-type: none"> 1. Use appropriate tools to test for strength, hardness, and flexibility of materials. 2. Apply the engineering design process to construct a prototype that meets certain specifications. 3. Explore how the unintended consequences of new technologies can impact society. 4. Research bioengineering technologies that advance health and contribute to improvements in our daily lives. 6. Develop an adaptive design and test its effectiveness. 	<ol style="list-style-type: none"> 1. Identify the tools and procedures needed to test the design features of a prototype. 2. Evaluate a protocol to determine if the engineering design process was successfully applied. 3. Distinguish between the intended benefits and the unintended consequences of a new technology. 4. Differentiate between adaptive and assistive engineered products (e.g., food, biofuels, medicines, integrated pest management).