

Science Unit	Nature of Science
Engineering Unit	Nature of Science & Engineering (NSE)
Timeline	August 10 th - September 30 th
Science/Engineering Standards	<p>SC.5.N.1.1 Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out investigations</p> <p>SC.5.N.1.2 Explain the difference between an experiment and other types of scientific investigation</p> <p>SC.5.N.1.3 Recognize and explain the need for repeated experimental trials</p> <p>SC.5.N.1.4 Identify a control group and explain its importance in an experiment</p> <p>SC.5.N.1.5 Recognize and explain that authentic scientific investigation frequently does not parallel the steps of the scientific method</p> <p>SC.5.N.1.6 Recognize and explain the difference between personal opinion and verified observation</p> <p>SC.5.N.2.1 Recognize and explain that science is grounded in empirical observations that are testable</p> <p>SC.5.N.2.2 Recognize and explain that when scientific investigations are carried out, the evidence produced by those investigations should be replicable by others.</p> <p>Standards for Engineering Design</p> <p>3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p> <p>3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</p> <p>3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</p>
Essential Questions	<ul style="list-style-type: none"> • How do science, engineering, and technological achievements affect our society both positively and negatively? • How are the Jamerson Design Process, scientific processes, and habits of mind used to explain and justify conclusions? • How do the fields of engineering interact with science to benefit society (Enterprise Village Connections)?
Science Vocabulary	<p>volume, observation, investigation, experiment, explanation, exploration, description, conclusion, prediction, evidence, manipulated/independent variable, responding/dependent variable, constant, inference, data, comparison/control, classification, graph, mass, model</p>
Investigation	<p>How can we change the period of a pendulum? (<i>Everyday Science Mysteries</i>)</p> <p>How does projectile mass affect distance on a catapult?</p>
Engineering Design Challenge	<p><i>Design and test a catapult</i></p>

Science Unit	Physical Science	
Engineering Unit	Electromagnetic Force & Resultant Motion (EFRM)	Gravitational Force & Resultant Motion (GFRM)
Timeline	October	November
Science Standards	SC.5.P.8.1 Compare and contrast basic properties of solids, liquids, and gases SC.5.P.8.2 Investigate and identify materials that will dissolve in water and those that will not and identify conditions that speed up or slow down the dissolving process SC.5.P.8.3 Demonstrate and explain that mixtures of solids can be separated based on observable properties of their parts such as particle size, shape, color, and magnetic attraction SC.5.P.8.4 Explore the scientific theory of atoms by recognizing that all matter is composed of parts that are too small to be seen without magnification SC.5.P.9.1 Investigate and describe that many physical and chemical changes are affected by temperature SC.5.P.10.1 Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical SC.5.P.10.2 Investigate and explain that energy has the ability to cause motion or create change SC.5.P.10.3 Investigate and explain that an electrically-charged object can attract an uncharged object and can either attract or repel another charged object without any contact between the objects SC.5.P.10.4 Investigate and explain that electrical energy can be transformed into heat, light, and sound energy, as well as the energy of motion SC.5.P.11.1 Investigate and illustrate the fact that the flow of electricity requires a closed circuit SC.5.P.11.2 Identify and classify materials that conduct electricity and materials that do not SC.5.P.13.1 Identify familiar forces that cause objects to move, such as pushes or pulls, including gravity acting on falling objects SC.5.P.13.2 Investigate and describe that the greater the force applied to it, the greater the change in motion of a given object SC.5.P.13.3 Investigate and describe that the more mass an object has, the less effect a given force will have on the object's motion SC.5.P.13.4 Investigate and explain that when a force is applied to an object but it does not move, it is because another opposing force is being applied by something in the environment so that the forces are balanced	
Essential Questions	<ul style="list-style-type: none"> What are some objects in real life that represent examples of how electricity can be transformed into heat, light, and sound energy? How do we determine whether an object is made of conductive or insulating material? How can the force in the magnetic/electrical field be manipulated to affect the strength of the field and the movement of electrons through the field? How do engineers manipulate the electrical/magnetic fields in order to improve life? 	<ul style="list-style-type: none"> How do different forces or amount of mass affect the motion of objects? How does energy cause motion or create change? How do engineers use force and motion concepts when designing bridges in different environments?
Science Vocabulary	Balanced force, states of matter, chemical change, closed circuit, dissolve, electrical energy, force, friction, inertia, kinetic energy, magnification, mechanical energy, mixtures, motion, observable properties, open circuit, opposing force, physical change, potential energy, properties of matter, temperature, transform, gravity	
Investigation	How does temperature affect dissolving rate? How does the (type of liquid/type of container) affect evaporation rate?	How do suspension cables affect the strength of a bridge? Tension/Torsion/Compression of materials Forces on a Roller Coaster- How is speed calculated?
Design Challenge	<i>Create a model atom (Element #1-13)</i> <i>Electrically wire a four-room model home</i>	<i>Design a Bridge that holds a set mass</i>

Science Unit	Earth Science	
Engineering Unit	Natural Resources (NR)	Space Exploration (SE) / Ecosystems (ECO)
Timeline	December-January	January-February
Science Standards	<p>SC.5.E.5.1 Recognize that a galaxy consists of gas, dust, and many stars, including any objects orbiting the stars. Identify our home galaxy as the Milky Way.</p> <p>SC.5.E.5.2 Recognize the major common characteristics of all planets and compare/contrast the properties of inner and outer planets.</p> <p>SC.5.E.5.3 Distinguish among the following objects of the Solar System – Sun, planets, moons, asteroids, comets –and identify Earth’s position in it.</p> <p>SC.5.E.7.1 Create a model to explain the parts of the water cycle. Water can be a gas, a liquid, or a solid and can go back and forth from one state to another.</p> <p>SC.5.E.7.2 Recognize that the ocean is an integral part of the water cycle and is connected to all Earth’s water reservoirs via evaporation and precipitation processes.</p> <p>SC.5.E.7.3 Recognize how air temperature, barometric pressure, humidity, wind speed and direction, and precipitation determine the weather in a particular place and time.</p> <p>SC.5.E.7.4 Distinguish among the various forms of precipitation (rain, snow, sleet, and hail), making connections to the weather in particular place and time.</p> <p>SC.5.E.7.5 Recognize that some of the weather-related differences, such as temperature and humidity, are found among different environments, such as swamps, deserts, and mountains,</p> <p>SC.5.E.7.6 Describe characteristics (temperature and precipitation) of different climate zones as they relate to latitude, elevation, and proximity to bodies of water.</p> <p>SC.5.E.7.7 Design a family preparedness plan for natural disasters and identify the reasons for having such a plan.</p> <p>SC.L.15.1 Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations,</p>	
Essential Questions	<ul style="list-style-type: none"> How is water perpetually recycled through the water cycle, and how do Earth’s reservoirs play an integral part? How do air pressure, barometric pressure, humidity, wind speed and direction, and precipitation (rain, snow, sleet, hail) determine the weather in a particular place and time? How do characteristics of different climate zones relate to latitude, elevation, and proximity to bodies of water? How can I plan for a natural disaster, and why is this important? 	<ul style="list-style-type: none"> How does the Earth compare to other bodies in our solar system, galaxy and universe? How have NASA’s space exploration programs affected our daily lives? How do the survival needs of humans affect space travel and life in space?
Science Vocabulary	Air pressure, aquifer, asteroid, climate, comet, condensation, earth, elevation, energy, front, humidity, latitude, longitude, Milky Way Galaxy, moon planet, precipitation, reservoir, satellite, solar system, space, Sun, water cycle, wind speed	
Investigations	How do salt and/or temperature affect density (layers of water)?	“We Have Capture” activity (Robotic Arm Design)
Engineering Design Challenge	<i>Create a family preparedness plan Hurricane Houses?</i>	<i>Design a lunar mission/habitat Kennedy Space Center Overnight Adventures & Astronaut Training</i>

Science Unit	Life Science
Engineering Unit	Life Processes (LP)
Timeline	March/April
Science Standards	<p>SC.5.L.14.1 Identify the organs in the human body and describe their functions, including the skin, brain, heart, lungs, stomach, liver, intestines, pancreas, muscles and skeleton, reproductive organs, kidneys, bladder, and sensory organs,</p> <p>SC.5.L.14.2 Compare and contrast the function of organs and other physical structures of plants and animals, including humans, for example: some animals have skeletons for support—some with internal skeletons others with exoskeletons—while some plants have stems for support.</p> <p>SC.5.L.15.1 Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.</p> <p>SC.5.L.17.1 Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.</p>
Essential Questions	<ul style="list-style-type: none"> • How do the body's systems work together in order to maintain optimal health in an open system? • How do the functions of organs compare to the physical structures of plants and animals including humans? • How do animals mutate over time and which adaptations are acquired vs, inherited? • How does engineering design and an understanding of science concepts work together to enhance human and animal life? • How can we use our knowledge of simple machines to understand how the body works and how to improve the output?
Science Vocabulary	Adaptation, behavior, bladder, rain, environment, evaporation, exoskeleton, function, habitat, heart, human, intestines, kidneys, life cycles, liver, lungs, migration, muscles, organ, pancreas, physical characteristics, behavioral characteristics, inherit, reproduce, sensory organs, skeleton stomach, survival-organisms, survive
Investigations	<p>How does nature inspire engineering design?</p> <p>Body Investigations: Testing reaction time, heart rate, etc.</p>
Engineering Design Challenge	<i>Design a "planamal"</i>