

| Big Idea | Standard | Breakdown |
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| 1. The Practice of Science | <p>SC.5.N.1.1 Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations, experiments requiring the identification of variables, collecting and organizing data, interpreting data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions. (High)</p> | <ul style="list-style-type: none"> • Knows that a <i>hypothesis</i> is a testable question. • Design and do an experiment to test a hypothesis. • Know that a <i>variable</i> is anything that can change in an experiment. • Observe and record any changes that take place during the experiment. • Record the changes as data in tables or charts. • <i>Graph</i> the data to show any trends. • Only make predictions (<i>claims</i>) that can be justified by the data. • Write conclusions based on your claims and evidence. |
| | <p>SC.5.N.1.2 Explain the difference between an experiment and other types of scientific investigation. (Moderate)</p> | <ul style="list-style-type: none"> • Knows that an <i>experiment</i> tests a hypothesis. • Explain how experiments and demonstrations are different. • Explain how experiments and models are different. |
| | <p>SC.5.N.1.3 Recognize and explain the need for repeated experimental trials. (Moderate)</p> | <ul style="list-style-type: none"> • Knows that a <i>trial</i> is a repeat of a test or observation. • Explain why repeating an experiment is important. • Give an example of how to repeat 3 experimental trials. • Knows that a <i>sample</i> is a small quantity intended to show how a whole (<i>larger quantity</i>) would react. • Explain how to repeat an experimental sample 3 times. |
| | <p>SC.5.N.1.4 Identify a control group and explain its importance in an experiment. (Moderate)</p> | <ul style="list-style-type: none"> • Knows that <i>control</i> means keeping all the variables in an experiment the same except the one variable being tested; and a <i>control group</i> is a separate experiment run without any changes in any conditions. • Identify all the <i>variables</i> in an experiment and set-up <i>controls</i> so only one variable is being tested. • Explain why controlling variables is important to experimentation. |
| | <p>SC.5.N.1.5 Recognize and explain that authentic scientific investigation frequently does not parallel the steps of "the scientific method." (Moderate)</p> | <ul style="list-style-type: none"> • Knows the steps involved in the 'traditional' <i>Scientific Method</i> - Research, Hypothesis, Procedure, collect and analysis Data, and write Conclusions used to investigate science problems. • Compare the <i>scientific method</i> to the <i>Engineering Design Process</i> - Ask, Imagine, Plan, Create, and Improve used to develop new technology. |
| | <p>SC.5.N.1.6 Recognize and explain the difference between personal opinion/interpretation and verified observation. (Moderate)</p> | <ul style="list-style-type: none"> • Knows that an <i>observation</i> is something you directly see, hear, smell, taste, or touch. • Knows that an <i>inference</i> is an explanation based on your past experiences similar to an opinion it's what you believe to be true without any verification. • Compare and contrast <i>inferences</i> and <i>observations</i> in an on-going way from one investigation to the next. |

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| 2. The Characteristics of Scientific Knowledge | SC.5.N.2.1 Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence. (Moderate) | <ul style="list-style-type: none"> • Knows that <i>empirical observations</i> are only what you can directly see, hear, smell, taste, touch, measure and verify. • Understands that all science knowledge comes from <i>data</i>, collected from <i>experimental trails</i>, over a long period time, which is verified by many scientist. • Understands that <i>accurate</i> and <i>precise observations</i> gathered over multiple trials and/or samples are more valid. • Understands that a science <i>theory</i> is our best explanation given our present technology and understanding. • Understands that a theory only becomes a <i>law</i> after verification over a long period of time by the entire scientific community. • Only investigates <i>testable</i> questions. • Routinely uses matching strategies that link claims (<i>results</i>) to <i>evidence (data)</i> before writing conclusions. |
| | 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. (Moderate) | <ul style="list-style-type: none"> • Knows that for experimental data to be <i>verified</i> the same outcomes should happen when other scientists repeat the same experiment. • Routinely repeat experimental trials to validate results and discuss/verify similar results collected by all teams. |
| 5. Earth in Space and Time | 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. (Low) | <ul style="list-style-type: none"> • Knows a <i>galaxy</i> is a group of millions of stars, dust, and all the objects orbiting around the stars in the group. • Knows the name of the <i>galaxy</i> the Earth is part of is called the <i>Milky Way</i>. |
| | SC.5.E.5.2 Recognize the major common characteristics of all planets and compare/contrast the properties of inner and outer planets. (Moderate) | <ul style="list-style-type: none"> • Knows the location of all eight planets and Pluto in our solar system in order from the sun. (<i>My Very Eager Mother Just Served Us Nachos on a Plate</i>) • Understands that the <i>inner planets</i> are located between the sun and <i>asteroid belt</i>. • Expand the model to include the locations and order Jupiter, Saturn, Uranus, Neptune and Pluto (<i>not a planet</i>). • Understand that the <i>outer planets</i> are located beyond the <i>asteroid belt</i>. |

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| 5. Earth in Space and Time (continued) | SC.5.E.5.2 Recognize the major common characteristics of all planets and compare/contrast the properties of inner and outer planets. (Moderate) | <ul style="list-style-type: none"> • Understands that Mercury, Venus, Earth and Mars are terrestrial planets with rocky surfaces and cores of iron located between the sun and the <i>asteroid belt</i> and can have a <i>moon(s)</i> (natural satellite) in <i>orbit</i> around them. • Understands that Jupiter, Saturn, Uranus, and Neptune are gas giants, with surfaces that are <u>not</u> solid, and can have many moons and/or <i>rings</i> in orbit around them. • Make a model comparing the size of all the planets with relationship to the sun, moon, and Pluto. • Knows that Pluto is a '<i>dwarf planet</i>' orbiting around the sun - so small it cannot clear other objects from its path (orbit). • Compare and contrast the rotation (day), revolution (year), orbits, surface features and atmospheres of the planets, sun, moon and Pluto. |
| | 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. (High) | <ul style="list-style-type: none"> • Knows that the <i>solar system</i> includes the sun, its planets, and all the other objects in <i>orbit</i> around the sun and/or planets. • Knows that a <i>planet</i> is a large object in space that revolves around the sun • Understands that the <i>Earth</i> is the third planet from the sun in our solar system. • Understands the <i>sun</i> is the closest <i>star</i> to Earth and is located at the center of our <i>solar system</i>. • Name all eight planets in order from the sun. • Explain why the planets revolve around the sun in separate orbits. • Knows that a <i>moon</i> is a natural satellite that orbits around a planet. • Research the number of moons that <i>orbit</i> each planet. • Knows that <i>asteroids</i> are large rocks, most smaller than a moon, and can exist all over the solar system, but most are concentrated in the in a belt orbiting the sun between Mars and Jupiter called the <i>asteroid belt</i>. • Knows that <i>comets</i> are a mixture of frozen gases and tiny particles of dust (<i>dirty snowballs</i>) locked in very large orbits around the sun. • Describe what happens to a comet when it approaches approach the sun. |
| 7. Earth Systems and Patterns | 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. (High) | <ul style="list-style-type: none"> • Knows that a <i>cycle</i> has no beginning or end and repeats itself continually. • Understands that water can <i>evaporate</i> - change form a liquid to a gas and then <i>condense</i> - change from a gas back to a liquid again (<i>or in the case of water into 'ice' (a solid) if the air temperature is below freezing (0 °C or 32 °F)</i>). • Knows the <i>atmosphere</i> is the air that surrounds the Earth • Understands that when <i>water vapor</i> collects on dust particles in the atmosphere it changes back into liquid water droplets in a process called condensation which forms the <i>clouds</i> in the atmosphere. • Model or demonstrate the processes of evaporation, and condensation. |

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| 7. Earth Systems and Patterns (continued) | <p>SC.5.E.7.2 Recognize that the ocean is an integral part of the water cycle and is connected to all of Earth's water reservoirs via evaporation and precipitation processes. (Moderate)</p> | <ul style="list-style-type: none"> • Knows <i>evaporation</i> is the change from a liquid to a gas. • Understands the <i>water cycle</i> is the movement of water between the air and ground; and recycle the water on Earth. • Understands that <i>precipitation</i> is when water or ice that falls back to Earth. • Understand that water <i>evaporates</i> from the surface of Earth moving into the atmosphere as <i>water vapor</i> where it <i>condenses</i> back to a liquid forming clouds and eventually falls back to Earth as <i>precipitation</i>. • Model the <i>water cycle</i> in a plastic baggy. |
| | <p>SC.5.E.7.3 (continued) Recognize how air temperature, barometric pressure, humidity, wind speed and direction, and precipitation determine the weather in a particular place and time. (Moderate)</p> | <ul style="list-style-type: none"> • Knows that <i>climate</i> is a general pattern of weather in a particular place on Earth over a period of time. • Understands that <i>climate</i> is determined by the type of <i>weather</i> conditions in a particular place and time. • On a U.S. weather map, identify where weather conditions are happening by using the 'weather symbols key' for <i>air temperature, barometric pressure, humidity, wind speed, wind direction, and precipitation</i>. |
| | <p>SC.5.E.7.4 Distinguish among the various forms of <i>precipitation</i> (rain, snow, sleet, and hail), making connections to the weather in a particular place and time. (High)</p> | <ul style="list-style-type: none"> • Knows that <i>precipitation</i> can take the form of rain, sleet, hail, or snow. • Explain how weather conditions in a particular place and time will affect the forms of precipitation <i>rain, snow, sleet, hail</i> that will fall. |
| | <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. (Moderate)</p> | <ul style="list-style-type: none"> • Knows that <i>weather</i> describes the outside air in a certain place at a certain time. • Knows that the <i>temperature</i> is how hot or cold the air is at the moment. • Knows that the <i>humidity</i> is how wet or dry the air feels at the moment. • Understands that the <i>weather conditions</i> in an area help determine the climate of its environments. • Compare and contrast <i>temperature</i> and <i>humidity</i> conditions common in some familiar environments (i.e., <i>wetlands, swamps, woodlands, forests, deserts, mountains</i>). |
| | <p>SC.5.E.7.6 Describe characteristics (temperature and precipitation) of different <i>climate zones</i> as they relate to latitude, elevation, and proximity to bodies of water. (High)</p> | <ul style="list-style-type: none"> • Knows the three (3) major climate zones on Earth are the polar, temperate and tropical. • Compare and contrast the <i>temperature</i> and <i>precipitation</i> in each major zone. • Draw and color code the <i>climate zones</i> on a world map. • Understands that the climate in a zone is influenced by its <i>latitude – distance north or south of Earth's equator, and/or elevation – height above, at, or below the nearest body of water</i>. |
| | <p>SC.5.E.7.7 Design a family preparedness plan for natural disasters and identify the reasons for having such a plan. (Moderate)</p> | <ul style="list-style-type: none"> • Knows that a <i>hurricane</i> is a slowly-spinning tropical storm that forms over water with winds at least 74 mph. • Write out the steps your family should follow to prepare for a <i>hurricane</i>. • Explain why your family should take <i>hurricanes</i> seriously. |

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| 8. Properties of Matter | SC.5.P.8.1 Compare and contrast the basic properties of solids, liquids, and gases, such as mass, volume, color, texture, and temperature. (Moderate) | <ul style="list-style-type: none"> • Knows a <i>solid</i> has a definite shape and volume. • Knows a <i>liquid</i> has a definite volume but <u>not</u> a definite shape. • Knows a <i>gas</i> has <u>no</u> definite shape or volume. • Knows the <i>mass</i> is the amount of matter in an object or substance measured in grams (g). • Knows the <i>volume</i> is the amount of space an object or substance takes up measured in liters (L) or cubic centimeters (cc). • Knows a <i>property</i> is a characteristic of a substance. • Observe, measure, and record the size, shape, color, texture, mass, volume, and temperature a variety of solid, liquid, and gas substances. |
| | SC.5.P.8.2 Investigate and identify materials that will dissolve in water and those that will not and identify the conditions that will speed up or slow down the dissolving process. (High) | <ul style="list-style-type: none"> • Knows that <i>dissolve</i> means to form a solution with another substance. • Knows that a <i>solution</i> is a mixture with one substance spread out so evenly in another substance that you cannot tell the two substances apart. • Investigate which substances can <i>dissolve</i> in water. • Record which substances do and do <u>not</u> dissolve in water. • Describe a test (<i>experiment</i>) you did to speed-up or slowed 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. (Moderate) | <ul style="list-style-type: none"> • Knows a <i>mixture</i> is two or more substances (<i>parts</i>) stirred together that <u>do not</u> form a new substance, but which <u>can</u> be separated by using the <i>properties</i> of their original parts (<i>substances</i>). • Understands that once both substances (<i>parts</i>) are mixed they are <u>no</u> longer spread out evenly. • Separate a mixture using the properties of its original substances (<i>parts used to make it</i>). |
| | SC.5.P.8.4 Explore the scientific theory of atoms (also called atomic theory) by recognizing that all matter is composed of parts that are too small to be seen without magnification. (Low) | <ul style="list-style-type: none"> • Knows that matter is made up of much smaller particles called <i>atoms</i>. • Observe different substances (<i>solids, liquids</i>) with a hand-lens, micro-viewer, or microscope to see what the parts too small to be seen (<i>with your eye only</i>) look like. Draw what you see using the magnifier. • Model what the particles (<i>atoms</i>) in a solid, liquid, and gas would look like using marshmallows. Draw what you think they might look like based on their definition (see SC.5.P.8.1 for definitions). |
| 9. Changes in Matter | SC.5.P.9.1 Investigate and describe that many physical and chemical changes are affected by temperature. (High) | <ul style="list-style-type: none"> • Knows a physical change is a change from one form to another without turning into a new substance • Knows a chemical change is a change that produces a new substance. • Understands that chemical reactions are changes that happen to substances during a chemical change. • Understands that chemical symbols are one or two-letter abbreviations for a substance. • Understands that temperature motion of the particles in a substance |

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| 9. Changes in Matter (continued) | SC.5.P.9.1 (continued) Investigate and describe that many physical and chemical changes are affected by temperature. (High) | <ul style="list-style-type: none"> • Knows that a <i>thermometer</i> is a tool used to measure temperature in Fahrenheit (°F) and/or Celsius (°C) degrees. • Design an experiment to test the effects of adding or removing heat to certain types of matter (<i>i.e., ice, chocolate, candle wax, marshmallows, etc.</i>). Write a testable question (<i>hypothesis</i>), test it, observe and record the results, make claims about what was affected by changing the temperature, justify each claim with the evidence (<i>data</i>) you collected, then write your conclusions. |
| 10. Forms of energy | SC.5.P.10.1 Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical. (Moderate) | <ul style="list-style-type: none"> • Knows that <i>energy</i> is the ability to cause motion or create change. • Understands <i>light</i> is energy you can see; including the colors, Red, orange, yellow, Green, Blue, indigo, and violet (Roy G Biv) of a rainbow (<i>the spectrum of visible light</i>). • Understands that <i>heat</i> is the energy of moving particles; and is measured with a thermometer. • Understands that <i>sound</i> is energy you can hear; when matter <i>vibrates</i>. • Understands <i>electrical energy</i> is the energy of charged particles (+, - or N, S poles). • Understands <i>chemical energy</i> is the energy stored in food, fuel, and batteries. • Understands that <i>mechanical energy</i> is the energy an object has because of its motion or position. • Investigate by making a survey of which “forms of energy” are responsible for providing powering the modern conveniences in your life, (<i>i.e., cell phones, hair dryer, ipods, microwave, Xbox, dishwasher, car, speed boat, etc.</i>). • Make a list of these devices in your home and match them to the ‘form of energy’; runs (<i>powers</i>) them. |
| | SC.5.P.10.2 Investigate and explain that energy has the ability to cause motion or create change. (High) | <ul style="list-style-type: none"> • Knows that <i>energy</i> is the ability to cause motion or create change. • Investigate by building models ways energy can be transformed from one form to another, such as a sailboat – wind energy transformed into the energy of motion (<i>sailing</i>) or a wind turbine – wind energy transformed into electricity. |
| | 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. (High) | <ul style="list-style-type: none"> • Knows that static energy is the build-up of electrically charged particles on an object. • Knows that a magnet is a tool that attracts charged particles in iron and a few other magnetic materials. • Knows attract means to pull toward and repel means to push apart, and are opposites. • Understands that being magnetic, any material attracted by a magnet, is a property of matter. |

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| 10. Forms of energy (continued) | SC.5.P.10.3 (continued) 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. (High) | <ul style="list-style-type: none"> • Knows that <i>magnetism</i> is a force that pulls magnetic materials across a distance. • Knows an <i>electromagnet</i> is a temporary <i>magnet</i> created by the flow of <i>electric current</i> around an iron bar. • Investigate ways to build-up electrically charged particles (static electricity) a plastic comb so it will attract small pieces of paper or Styrofoam. • Investigate which materials are attracted by a <i>magnet</i> (i.e., <i>iron metals</i>) and which objects are <u>not</u> attracted. • Investigate what happens when two magnets come close to each other. Describe the alignment when two magnets attract and/or repel each other. • Build an electromagnet with a dry cell battery (D or 12 volt), insulated wire, and an iron bar (nail) that will attract other small iron materials. |
| | 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. (High) | <ul style="list-style-type: none"> • Observe pictures, videos, or demonstrations of examples of energy <i>transformations</i> from electricity to <i>heat, light, sound, and motion</i>. Identify and record what the electricity changes into in each example. |
| 11. Energy Transfer and Transformations | SC.5.P.11.1 Investigate and illustrate the fact that the flow of electricity requires a closed circuit (a complete loop). (Moderate) | <ul style="list-style-type: none"> • Knows that a <i>circuit</i> is a path electric current flows through, a <i>closed circuit</i> has <u>no</u> breaks, and an <i>open circuit</i> has a break and the current <u>cannot</u> flow through it. • Construct simple, series, and parallel electrical circuits using miniature lamp sockets, wire, and batteries. • Diagram the way the electric current flows through each circuit. |
| | SC.5.P.11.2 Identify and classify materials that conduct electricity and materials that do not. (Moderate) | <ul style="list-style-type: none"> • Knows that a <i>conductor</i> of electricity is a substance that allows electric current to pass through it, and an <i>insulator</i> is a material that <u>does not</u> allow electricity to flow through it. • Design an experiment to test a variety of different substances to determine if they are conductors or insulators, write your predictions, record your observations, and write your conclusions (<i>remember to justify any claims with evidence from your data</i>). |
| 13. Forces and Changes in Motion | SC.5.P.13.1 Identify familiar forces that cause objects to move, such as pushes or pulls, including gravity acting on falling objects. (Low) | <ul style="list-style-type: none"> • Knows a force is a push or pull. • Demonstrate ways to apply different forces to a variety of 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. (Moderate) | <ul style="list-style-type: none"> • Investigate the effects two different forces, larger and smaller, will have on the motion of the same mass/weight. • Understands the larger the force, the greater the motion. |
| | 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. (Moderate) | <ul style="list-style-type: none"> • Investigate the effects the same force will have on the motion of two different masses, larger and smaller. • Understands that larger the mass, the less the motion. |

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| 13. Forces and Changes in Motion (continued.) | 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. (High) | <ul style="list-style-type: none"> • Knows <i>friction (rubbing against another object)</i> is a force that resists motion. • Knows that <i>drag</i> is air resistance (<i>the friction caused by moving air</i>) • Investigate what happens when different forces are applied to different masses/weights. • Understands that for every force that applied to an object, there is an equal and opposite reaction force that will resist the objects motion. |
| 14. Organization and Development of Living Things | 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. (Moderate) | <ul style="list-style-type: none"> • Identify the organs listed to the left by their location, structure and function. |
| | 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. (Moderate) | <ul style="list-style-type: none"> • Compare and contrast the structural supports of a plants to the different skeletons of animals. |
| 15. Diversity and Evolution of Living Things | 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. (High) | <ul style="list-style-type: none"> • Knows that to survive, plants or animals must live to produce offspring. • Knows adapt means to physically change to the environment. • Understands the 'basic things' plants and animals need to survive (<i>food, shelter, water, space to live</i>). • Explain ways plants and animals <i>adapt</i> physically to changes in their environment. • Give non-examples/ways plants or animals could/have become endangered, threatened, or extinct in the past |
| 17. Interdependence | 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. (Moderate) | <ul style="list-style-type: none"> • Knows that an adaptation is a structure or behavior that helps an organism survive in its surroundings. • Identify and describe ways plants and animals adapt to their environments/habitats. • Describe and explain how a plant or animals life cycles helps them survive. • Describe and explain behaviors that can help animals survive. |