

Standard Name	Description	Advanced	Proficient	Developing	Emerging
SC.01.ET.01	Organizes a food web showing the cycling of energy and matter and classifies organisms within the food web as producers, consumers or decomposers.	<ul style="list-style-type: none"> <li>*Describes the role producers, consumers, and decomposers play in their communities</li> <li>*Describes the interactions between producers, consumers, and decomposers in an ecosystem</li> <li>*Discusses the limitations of a food web as a model of an ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>*Explains the role producers, consumers, and decomposers play in their communities</li> <li>*Graphically displays a food web to show producers, consumers, and decomposers in an ecosystem</li> <li>*Describes a food web accurately depicting the flow of energy in an ecosystem using arrows to indicate energy flow and matter cycles</li> </ul>	<ul style="list-style-type: none"> <li>*Defines producers, consumers, <b>AND</b> decomposers.</li> <li>*Identifies producers, consumers, <b>AND</b> decomposers in an ecosystem.</li> <li>*Describes a food web that depicts the flow of energy in an ecosystem.</li> <li>*Describes energy flow.</li> </ul>	<ul style="list-style-type: none"> <li>*Defines producers, consumers, <b>OR</b> decomposers.</li> <li>*Identifies producers, consumers, <b>OR</b> decomposers in an ecosystem.</li> <li>*List steps of energy flow within an ecosystem.</li> </ul>
SC.01.ET.02	Compares and contrasts reasons for uneven warming of the Earth's surface (i.e. seasons and Earth's relative tilt, day/night cycle and Earth's orbit, and Earthen material).	<ul style="list-style-type: none"> <li>*Illustrates and labels the Earth's axis compared with its seasons, labeling distance from the sun during each season <b>AND</b> compares their research to what is commonly presented in reference material</li> <li>*Describes the need for leap years, and the historical use of calendars</li> </ul>	<ul style="list-style-type: none"> <li>*Illustrates and labels the Earth's axis as compared with seasons</li> <li>*Compares the climate zones of the northern &amp; southern hemispheres through one year</li> <li>*Compares the day lengths at different latitudes and infers the affect on climate</li> <li>*Describes impact of Earthen materials on climate and weather (e.g. Land/Sea breeze, altitude, ocean currents, continentality, urban heat islands, north/south exposure)</li> </ul>	<ul style="list-style-type: none"> <li>*Explains the impact of Earth's axial tilt (i.e. reason for the seasons)</li> <li>*Describes leap years</li> <li>*Compares the day lengths in different seasons</li> <li>*Investigates heat capacity of materials</li> </ul>	<ul style="list-style-type: none"> <li>*Identifies the counter-clockwise rotation of the Earth on its axis, the 23.5° axis tilt, counter-clockwise revolution of the Earth around the sun with significant help or the use of a reference.</li> </ul>
SC.01.ET.03	Using a graphic organizer, diagram the relationship between phase changes (sublimation, condensation, evaporation and energy transfer (convection, conduction and radiation) and infer the affect (e.g. on weather and climate).	<ul style="list-style-type: none"> <li>*Observes and describes sublimation, condensation and evaporation</li> <li>*Observes and describes energy transfer</li> <li>*Relates properties of matter and energy transfer to global systems such as weather and/or climate</li> </ul>	<ul style="list-style-type: none"> <li>*Observes and illustrates sublimation, condensation and evaporation</li> <li>*Observes and illustrates energy transfer</li> <li>*Relates properties of matter and energy transfer to weather patterns</li> </ul>	<ul style="list-style-type: none"> <li>*Describes sublimation, condensation and evaporation</li> <li>*Defines energy transfer</li> <li>*Lists properties of matter and energy transfer</li> </ul>	<ul style="list-style-type: none"> <li>*Defines sublimation, condensation and evaporation.</li> <li>*Observes and illustrates energy transfer.</li> <li>*Lists matter and energy transfer types.</li> </ul>

SC.01.ET.04	Uses models to explain the relationship between convection currents within the mantle and the large-scale movements of the surface.	<ul style="list-style-type: none"> <li>*Describes properties of convection currents</li> <li>*Illustrates the rock cycle and identifies convection currents</li> <li>*Maps the layers of the Earth's surface (i.e. asthenosphere and lithosphere)</li> <li>*Describes the movement of the mantle (long-term and short-term effects)</li> </ul>	<ul style="list-style-type: none"> <li>*Defines convection currents</li> <li>*Illustrates the rock cycle and identifies convection currents</li> <li>*Maps the layers of the Earth's surface (i.e. asthenosphere and lithosphere)</li> <li>*Describes the movement of the mantle (long-term and short-term effects)</li> </ul>	<ul style="list-style-type: none"> <li>Defines convection currents</li> <li>*Illustrates the rock cycle and identifies convection currents</li> <li>*Maps the layers of the Earth's surface (i.e. asthenosphere and lithosphere)</li> <li>*Describes the movement of the mantle (long-term and short-term effects)</li> </ul>	<ul style="list-style-type: none"> <li>*Defines convection currents</li> <li>*Illustrates the rock cycle and identifies convection currents</li> <li>*Maps the layers of the Earth's surface (i.e. asthenosphere and lithosphere)</li> <li>*Describes the movement of the mantle (long-term and short-term effects)</li> </ul>
SC.01.GC.01	Identifies strategies for minimizing erosion, such as reforestation, dikes, windbreaks, and off road activity.	<ul style="list-style-type: none"> <li>*Describes five strategies to minimize human impact on erosion</li> <li>*Creates a document for the benefit of all to decrease human induced erosion (e.g. brochure, interpretative sign, speech).</li> </ul>	<ul style="list-style-type: none"> <li>*Describes three strategies to minimize human impact on erosion</li> <li>*Creates a document for the benefit of all to decrease human induced erosion (e.g. brochure, interpretative sign, speech)</li> </ul>	<ul style="list-style-type: none"> <li>*Describes a strategy to minimize human impact on erosion</li> <li>*Creates a document for the benefit of all to decrease human induced erosion (e.g. brochure, interpretative sign, speech)</li> </ul>	<ul style="list-style-type: none"> <li>*Lists a strategy to minimize human impact on erosion</li> </ul>
SC.01.GC.02	Uses knowledge of water cycle to explain changes in Earth's surface.	<ul style="list-style-type: none"> <li>*Illustrates and describes the water cycle</li> <li>*Describes seasonal changes of salinity and turbidity of water</li> <li>*Researches and reports on three water issues in the United States due to water cycle abnormalities (both short term and long term)</li> <li>*Researches and reports on a geologically historic event which resulted in water loss or abundance (e.g. glaciation, desertification, ice age, flooding)</li> </ul>	<ul style="list-style-type: none"> <li>*Illustrates the water cycle</li> <li>*Researches and describes two water issues in the United States due to water cycle abnormalities (both short term and long term)</li> <li>*Researches and describes a geologically historic event which resulted in water loss or abundance (e.g. glaciation, desertification, ice age, flooding)</li> </ul>	<ul style="list-style-type: none"> <li>*Illustrates the water cycle</li> <li>*Researches a water issue in the United States due to water cycle abnormalities (both short term and long term)</li> <li>*Researches a geologically historic event which resulted in water loss or abundance (e.g. glaciation, desertification, ice age, flooding)</li> </ul>	<ul style="list-style-type: none"> <li>*Defines the water cycle.</li> <li>*Lists some geologically historical events in which the water cycle changed the surface of the Earth</li> </ul>
SC.01.GC.03	Uses knowledge of rock cycle to explain changes in Earth's surface.	<ul style="list-style-type: none"> <li>*Describes all phases of the rock cycle</li> <li>*Describes mechanisms for physical changes (rock)</li> <li>*Describes igneous, metamorphic and sedimentary rock</li> </ul>	<ul style="list-style-type: none"> <li>*Models all phases of the rock cycle</li> <li>*Identifies mechanisms for physical change</li> <li>*Clearly labels rock at all three phases: igneous, metamorphic and sedimentary</li> </ul>	<ul style="list-style-type: none"> <li>*Models two phases of the rock cycle</li> <li>*Identifies mechanisms for physical change</li> <li>*Defines igneous, metamorphic and sedimentary</li> </ul>	<ul style="list-style-type: none"> <li>*Models a phase of the rock cycle</li> <li>*Defines two of the following terms: igneous, metamorphic, and sedimentary</li> </ul>

SC.01.GC.04	Interprets topographical maps to identify features, such as mountains, lakes, tundra, permafrost, and describes how the movement of tectonic plates result in both slow changes (formations of mountains, ocean floors, and basins) and short-term events (volcanic eruptions, seismic waves, and earthquakes) on Earth's surface	<ul style="list-style-type: none"> <li>* Explains how vertical elevations and horizontal distances can be measured using contour lines, using appropriate units</li> <li>*Uses a topographic map to measure both vertical relief and horizontal distance</li> <li>*Identify ten geologic features on a topographical map and determine formation type (long term vs. short term)</li> </ul>	<ul style="list-style-type: none"> <li>* Describes how vertical elevations and horizontal distances can be measured using contour lines using appropriate units</li> <li>*Uses a topographic map to measure both vertical relief and horizontal distance</li> <li>*Identify eight geologic features on a topographical map and determine formation type (long term vs. short term)</li> </ul>	<ul style="list-style-type: none"> <li>* Uses contour lines to measure horizontal distances and vertical elevations, using appropriate units</li> <li>*Identify five geologic features on a topographical map and determine formation type (long term vs. short term)</li> </ul>	<ul style="list-style-type: none"> <li>* With significant help, Uses contour lines to measure horizontal distances and vertical elevations, using appropriate units</li> <li>*With significant help identify ten geologic features on topographical maps and determine formation type (long term vs. short term)</li> </ul>
SC.01.ME.01	Describes the weather using accepted meteorological terms (i.e. pressure systems, fronts, precipitation), comparing their sources and effects	<ul style="list-style-type: none"> <li>* Explains and illustrates how the following instruments work and what they measure: barometer, hygrometer, thermometer, and anemometer</li> <li>* Predicts the weather and uses measurements to defend the prediction</li> </ul>	<ul style="list-style-type: none"> <li>* Uses the following instruments to take meteorological data: barometer, hygrometer, thermometer, and anemometer</li> <li>* Uses data collected or researches data to predict local weather</li> </ul>	<ul style="list-style-type: none"> <li>* Explains how the following instruments work and what they measure: barometer, hygrometer, thermometer, and anemometer</li> <li>* Describes how to predict the weather with or without instruments</li> </ul>	<ul style="list-style-type: none"> <li>* Defines the following instruments and what they measure: barometer, hygrometer, thermometer, and anemometer</li> <li>* Briefly describes how others predict the weather</li> </ul>
SC.01.ME.02	Compares and contrasts physical features that assist or restrict the flow of atmospheric moisture into an area	*Teaches others the 6 major features that influence weather on a given area	<ul style="list-style-type: none"> <li>*Explains and illustrates how the 6 major that features influence weather on a given area</li> <li>*Identifies which features have the greatest impact on local weather</li> </ul>	*Partially explains and illustrates how the 6 major features that influence weather on a given area	Knows the acronym LAPDOG but can't identify all elements (i.e. latitude, altitude, prevailing winds, distance from sea, Ocean currents, great mountain barriers)
SC.01.FN.01	Using a graphic organizer, compare and contrast Newton's Laws of Motion and illustrate the effect of balanced and unbalanced forces (acceleration)	<ul style="list-style-type: none"> <li>*Describes in own words Newton's Laws of Motion</li> <li>*Defines Newton's Laws mathematically</li> <li>*Compares and contrasts equilibrium and acceleration</li> <li>*Describes the motion of an object in acceleration</li> <li>*Draw a free body diagram of one object at equilibrium</li> <li>*Draw a free body diagram of an object that is accelerating</li> </ul>	<ul style="list-style-type: none"> <li>*Describe Newton's Laws of Motion</li> <li>*Define equilibrium and acceleration</li> <li>*Describe the forces exerted on an object that is accelerating</li> <li>*Draw a free body diagram of an object in equilibrium</li> </ul>	<ul style="list-style-type: none"> <li>*Defines Newton's Laws of Motion.</li> <li>*Define equilibrium and acceleration</li> <li>*Describe the motion of an object that is accelerating</li> </ul>	<ul style="list-style-type: none"> <li>*Defines equilibrium and acceleration</li> <li>*Draw a free body diagram of an object in equilibrium</li> </ul>

SC.01.FN.02	Demonstrates and explains circular motion.	<ul style="list-style-type: none"> <li>*Illustrates and describes a body in uniform circular motion.</li> <li>*Describes uniform circular motion.</li> <li>*Compares uniform circular motion to non-uniform circular motion</li> <li>*Labels vector forces of motion.</li> </ul>	<ul style="list-style-type: none"> <li>*Illustrates a body in uniform circular motion with vector forces labeled.</li> <li>*Illustrates a body in non-uniform circular motion with vector forces labeled.</li> <li>*Describes non-uniform circular motion.</li> <li>*Describes uniform circular motion.</li> </ul>	<ul style="list-style-type: none"> <li>*Describes uniform circular motion.</li> <li>*Defines non-uniform circular motion.</li> <li>*Illustrates a body in uniform circular motion.</li> </ul>	<ul style="list-style-type: none"> <li>*Defines uniform circular motion.</li> </ul>
SC.01.FN.03	Describes the characteristics of an ocean wave in terms of amplitude, wavelength and frequency and its affect on a shoreline.	<ul style="list-style-type: none"> <li>*Defines amplitude, wavelength and frequency</li> <li>*Calculates wavelength, amplitude and frequency</li> <li>*Illustrates and describes how different wavelengths within the electromagnetic spectrum are commonly used (radio, x-rays, ultraviolet, visible light, etc)</li> </ul>	<ul style="list-style-type: none"> <li>*Defines amplitude, wavelength and frequency</li> <li>*Describes how to calculate wavelength and frequency</li> <li>*Describes how different wavelengths (within the electromagnetic spectrum) are commonly used (radio, x-rays, ultraviolet, visible light etc)</li> <li>*Describes two types of waves</li> </ul>	<ul style="list-style-type: none"> <li>*Defines two of the following: amplitude, wavelength, frequency</li> <li>*Can accurately calculate wavelength or frequency</li> </ul>	<ul style="list-style-type: none"> <li>*Defines one of the following: amplitude, wavelength, frequency</li> <li>*Knows formula for wavelength or frequency</li> </ul>
SC.01.SP.01	Asks testable questions and states relevance to science inquiry	<ul style="list-style-type: none"> <li>*Describes testable and non-testable questions</li> <li>*Formulates AND defends testable questions derived by emerging patterns in scientific inquiry</li> </ul>	<ul style="list-style-type: none"> <li>*Compares and contrasts testable and non-testable questions</li> <li>*Formulates testable questions that lead to scientific inquiry</li> </ul>	<ul style="list-style-type: none"> <li>*Defines testable and non-testable questions</li> </ul>	<ul style="list-style-type: none"> <li>*Recognizes a testable question</li> </ul>
SC.01.SP.02	Predict outcome and develop a hypothesis based on a testable question	<ul style="list-style-type: none"> <li>*Develops and defends a hypothesis based on a testable question</li> <li>*Predicts and defends an outcome based on emerging patterns in a complex system</li> </ul>	<ul style="list-style-type: none"> <li>*Develops a hypothesis based on a testable question</li> <li>*Predicts an outcome based on evidence</li> </ul>	<ul style="list-style-type: none"> <li>*Develops a hypothesis</li> <li>*Predicts an outcome based on background knowledge</li> </ul>	<ul style="list-style-type: none"> <li>*Develops a hypothesis</li> <li>*Predicts an outcome based on background knowledge</li> </ul>

SC.01.SP.03	Collaborate to design and conduct repeatable and controlled inquiries and investigations	<ul style="list-style-type: none"> <li>*Designs and conducts investigations in a group multiple times that are valid and reliable</li> <li>*Reflects on investigations as a group</li> <li>*Identifies control groups and dependent and independent variables</li> </ul>	<ul style="list-style-type: none"> <li>* As a group, designs investigations that are valid or reliable using all steps of a scientific method</li> <li>*Conducts investigations as designed</li> <li>*Identifies experimental AND control groups</li> <li>*Identifies dependent and independent variables</li> </ul>	<ul style="list-style-type: none"> <li>*Designs investigations as a group using one or more steps of a scientific method</li> <li>*Conducts investigations as designed</li> <li>*Identifies dependent and independent variables AND experimental control</li> </ul>	<ul style="list-style-type: none"> <li>*Designs investigations as a group</li> <li>*Conducts investigations with changes to design</li> <li>*Identifies variables and experimental control</li> </ul>
SC.01.SP.04	Collaborate to design and conduct an experiment that follows the steps of the scientific method, collecting qualitative and quantitative data, and assess the validity of the results	<ul style="list-style-type: none"> <li>*Designs and conducts investigations in a group multiple times that are valid and reliable</li> <li>*Reflects on the investigation as a group</li> </ul>	<ul style="list-style-type: none"> <li>*Designs investigations as a group that is valid or reliable using all steps of a scientific method to collect data</li> <li>*Conducts investigations as designed</li> <li>*Protocol attempts to mitigate the effect of sources of error on the validity of the data collected</li> </ul>	<ul style="list-style-type: none"> <li>*Designs investigations as a group using one or more steps of a scientific method</li> <li>*Conducts investigations as designed</li> <li>*Identifies sources of errors in the experiment</li> </ul>	<ul style="list-style-type: none"> <li>*Designs investigations as a group</li> <li>*Conducts investigations with changes to design</li> <li>*Identifies variables</li> </ul>
SC.01.SP.05	Analyzes data statistically (i.e. mean, median, mode and range)	<ul style="list-style-type: none"> <li>*Teaches others how to analyze data statistically using mean, median, mode and range</li> </ul>	<ul style="list-style-type: none"> <li>*Compare and contrast mean, median, mode and range</li> <li>*Organizes data and calculates range, mean, median and mode when appropriate</li> </ul>	<ul style="list-style-type: none"> <li>*Defines mean, median, mode AND range</li> <li>*Describes how the data is organized</li> <li>*Explains how to calculate range, mean, median AND mode</li> </ul>	<ul style="list-style-type: none"> <li>*Defines mean</li> <li>*Describes why data should be organized</li> <li>*Describes how to calculate mean, with significant help</li> </ul>
SC.01.SP.06	Assess the reliability of the data and draw conclusions with reference to hypothesis	<ul style="list-style-type: none"> <li>*Constructs and defends conclusions based on data and observations *Includes more than one specific reason to support or reject hypothesis</li> <li>*Reflects on study to make appropriate revisions</li> </ul>	<ul style="list-style-type: none"> <li>*Constructs conclusions based on data and observations</li> <li>*Includes detailed evaluation of hypothesis</li> <li>*Includes one specific reason to support or reject hypothesis</li> </ul>	<ul style="list-style-type: none"> <li>*Constructs conclusions based on data OR observations</li> <li>*Includes broad evaluation of hypothesis</li> <li>*States if hypothesis is supported or rejected without rationale</li> </ul>	<ul style="list-style-type: none"> <li>*Constructs conclusions</li> <li>*Includes an evaluation of hypothesis, with significant help</li> </ul>
SC.01.SP.07	Communicate experimental findings, the limitations in the use of models or protocols and differences in the results of repeated experiments	<ul style="list-style-type: none"> <li>*Significantly helps others to prepare and present a proficient presentation OR peer evaluates a presentation prior to presentation</li> </ul>	<ul style="list-style-type: none"> <li>*Working with a group or alone, prepares a multi-media presentation describing the scientific investigation including: defending conclusions using examples from the investigation, includes data trends, possible sources of error and discrepancies and importance of repeated trials</li> </ul>	<ul style="list-style-type: none"> <li>*Working with a group or alone, prepares a multi-media presentation outlining the steps of a scientific method used in the investigation</li> <li>*States importance of repeated trials</li> </ul>	<ul style="list-style-type: none"> <li>*Working with a group, prepare and present their findings on a scientific investigation</li> <li>*Conclusions are described AND data trends are addressed</li> <li>*States importance of repeated trials</li> </ul>

SC.01.SP.08	Utilize scientific equipment and materials in an appropriate and safe manner	<ul style="list-style-type: none"> <li>*Describes and models proper use of and care of lab equipment</li> <li>*Teaches others how to use lab equipment appropriately and how to be safe in a lab setting</li> </ul>	<ul style="list-style-type: none"> <li>*Describes proper use and care of lab equipment</li> <li>*Consistently uses lab equipment safely and for the intended purpose</li> <li>* Watches for safety violations and helps others to remain safe in a lab setting</li> </ul>	<ul style="list-style-type: none"> <li>*Identifies proper use and care of lab equipment</li> <li>*Often uses lab equipment for the intended purpose</li> <li>*Behavior some-times inappropriate for a lab setting (e.g. horseplay, food in lab area)</li> </ul>	<ul style="list-style-type: none"> <li>*Identifies proper use of lab equipment</li> <li>*Occasionally uses lab equipment for the intended purpose</li> <li>*Behavior often inappropriate for a lab setting (e.g. horseplay, food in lab area)</li> </ul>
SC.01.SP.09	Maintain a science notebook that explains scientific ideas, solutions, and methods <b>AND</b> Documents scientific work: questions, data, inferences, conclusions, next steps, technical drawings, reflections and metadata	<ul style="list-style-type: none"> <li>*Science notebook exceeds expectations in a significant way</li> </ul>	<ul style="list-style-type: none"> <li>*Science notebook is organized, complete and provides evidence of scientific work</li> </ul>	<ul style="list-style-type: none"> <li>*Science notebook shows evidence of scientific work and reflection</li> </ul>	<ul style="list-style-type: none"> <li>*Science notebook is missing or incomplete</li> </ul>
SC.01.SP.10	Design and conduct a simple investigation about the local environment	<ul style="list-style-type: none"> <li>*Designs and conducts a local study to gain scientific knowledge of environment</li> <li>*Presents and defends conclusions to multiple members of the community</li> </ul>	<ul style="list-style-type: none"> <li>*Designs and conducts a local study of interest</li> <li>*Presents conclusions of study</li> </ul>	<ul style="list-style-type: none"> <li>*Designs a local study of interest</li> <li>*Conducts a local study of interest</li> </ul>	<ul style="list-style-type: none"> <li>*Designs a local study of interest</li> </ul>
SC.01.SP.11	Compares own work to the work of peers in order to identify multiple paths used to investigate and evaluate potential solutions to a question or problem	<ul style="list-style-type: none"> <li>*Presents an independent investigation to a group of peers</li> <li>*Compares and contrasts methods of investigations</li> <li>*Evaluates potential solutions to a specific questions or problem within the investigation as identified by the group</li> <li>*Describes alternative designs for investigation</li> </ul>	<ul style="list-style-type: none"> <li>*Describes an independent investigation to a group of peers</li> <li>*Compares and contrasts own methods to those of a peer</li> <li>*Evaluates alternative paths taken in the investigation</li> <li>*Evaluates potential solutions to questions or problems within the investigation</li> </ul>	<ul style="list-style-type: none"> <li>*Explains an independent investigation</li> <li>*Compares own methods to those of a peer</li> <li>*Identifies potential paths to take for investigation</li> <li>*Identifies potential solutions to questions or problems within the investigation</li> </ul>	<ul style="list-style-type: none"> <li>*Describes an investigation</li> <li>*Identifies alternative paths taken to investigate</li> <li>*Identifies questions OR problems within the investigation</li> </ul>
SC.01.SP.12	Describes the affect of public policy on one's own life using scientific knowledge and technology.	<ul style="list-style-type: none"> <li>*Presents 3 specific public policies that affect own life to members of the community</li> <li>*Uses appropriate scientific knowledge in presentation</li> <li>*Consistently uses appropriate scientific and technological terminology</li> </ul>	<ul style="list-style-type: none"> <li>*Presents 2 specific public policies that affect own life, to peers</li> <li>*Shows scientific knowledge in presentation.</li> <li>*Uses appropriate technology</li> <li>*Often uses appropriate scientific and technological vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>*Researches a specific public policy that affects own life</li> <li>*Shows some scientific knowledge</li> <li>*Uses technology to research or to prepare a presentation</li> <li>*Uses some appropriate scientific and technological vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>*Describes a public policy that affects own life</li> <li>*Shows some scientific knowledge</li> <li>*Uses some appropriate scientific or technological vocabulary</li> </ul>