

Standard Name	Description	Advanced	Proficient	Developing	Emerging
SC.E.AS.01	Compares and contrasts characteristics of planets and stars with regard to light reflecting, light emitting, size and position, geologic features, and composition	<ul style="list-style-type: none"> *Illustrates the physical characteristics of the planets in our solar system AND includes a discussion on the reclassification of Pluto, AND reasons for differences in light reflection between planets and stars *Illustrates and explains differences in light emission from various stars in the night sky AND connects this to the life cycle of stars 	<ul style="list-style-type: none"> *Compares and contrasts the physical characteristics of the planets in our solar system, to include distance from the sun, orbital circumference, day length, AND year length of each planet *Identifies differences in light reflection between planets and stars *Using a Hertzsprung-Russell diagram, describes the differences of light emission from various stars in the night sky 	<ul style="list-style-type: none"> *Describes the physical characteristics of some planets, but some information may be missing or incomplete *Recognizes the differences in light reflection between planets and stars *Understands there are differences of light emission from various stars in the night sky based on star type 	<ul style="list-style-type: none"> *Describes the physical characteristics of some planets, with significant help (i.e. day/night and year length, composition, moons/rings) *Recognizes the differences between planets and stars *Understands there are differences in light emission from various stars in the night sky
SC.E.AS.02	Creates a <i>scale</i> model (i.e. AU, km, light years) of the solar system illustrating size and location/position	<ul style="list-style-type: none"> * Scale model of the solar system exceeds expectations in a significant and meaningful way *Uses light-year units to determine distance between stars in the same constellation *Accurately illustrates the relationship of size and brightness of a star to the distance from observer 	<ul style="list-style-type: none"> * Creates a scale model of the solar system, illustrating size and location of each planet, using appropriate units *Accurately explains a light year and why OR when it is used *Uses light-year units to determine distance between three or more celestial bodies *Illustrates the relationship of size and brightness of a star to the distance from observer 	<ul style="list-style-type: none"> *Creates a scale model of the solar system, illustrating size and location of each planet, although some information may be missing or incorrect *Defines light-year *Describes the relationship of size and brightness of a star to the distance from observer 	<ul style="list-style-type: none"> *Creates a scale model of the solar system, illustrating size and location of each planet with significant help *Understands the relationship of size and brightness of a star to the distance from observer
SC.E.AS.03	Using digital images, compare and contrast Earth/moon and Jupiter/Galileo (4) moon system and infer the effects on the planet. (lunar phases, tides, eclipse, seasons)	<ul style="list-style-type: none"> *Applies knowledge of planetary geometry to another planet/moon system to infer the physical conditions found on the planet 	<ul style="list-style-type: none"> * Infers and models the effect of geometry on planets by explaining the cause and effect of planetary tilt, satellite position and orbit, and revolution on a planet 	<ul style="list-style-type: none"> * Defines the effect of geometry planet, moon and sun system (e.g. partially explains the cause and effect of planetary tilt, satellite position and orbit, eclipse, moon phase and revolution) 	<ul style="list-style-type: none"> *Describes the differences between an inference and an observation and recognizes both as scientifically important *Compares and Contrasts planetary motion (i.e. rotation, orbit and revolution)
SC.E.AS.04	Compare and contrasts meteors, meteoroids, meteorites, asteroids and comets; investigates the formation of craters	<ul style="list-style-type: none"> * Explains and illustrates the components of a comet and its motion * Describes satellites, including their motion, function, and orbits * Explains and illustrates the life cycle of an asteroid traveling near the Earth *Identify evidence of crater formation on Earth 	<ul style="list-style-type: none"> * Explains the components of a comet and its motion * Compares and contrasts satellites, comets, asteroids, meteors meteoroids, and meteorites *Investigates the formation of craters 	<ul style="list-style-type: none"> * Defines satellite, comet, and asteroid * Defines meteor, meteoroids, and meteorites *Researches the formation of craters 	<ul style="list-style-type: none"> * Identifies satellites (e.g. man-made and natural), comet, meteor, crater and asteroid

SC.E.AS.05	Use models to describe and explain astronomical events (e.g. big bang theory, eclipse, planetary seasons, day/night cycle, lunar phases, auroras)	<ul style="list-style-type: none"> * Helps others to create models to illustrate the big bang theory, an eclipse, seasons, day/night planetary cycles *Finds examples of these astronomical events on other planets in our solar system 	<ul style="list-style-type: none"> * Creates models to illustrate major astronomical events. * Discusses the accuracy of each model 	<ul style="list-style-type: none"> * Creates models to illustrate some major astronomical events, which may be incomplete or inaccurate 	<ul style="list-style-type: none"> *With significant help, creates models to illustrate major astronomical events.
SC.E.ST.01	Compare and contrast forces that allow a structure to stand (i.e. live and dead load, tension, compression) including the arrangement of materials	<ul style="list-style-type: none"> *Investigates forces that allow a structure to stand, reflects on design AND presents project using appropriate architectural and physics terminology correctly 	<ul style="list-style-type: none"> *Investigates forces that allow a structure to stand, recording data, documenting and improving design *Usually uses appropriate physics terminology correctly *Reflects to improve on design 	<ul style="list-style-type: none"> *Investigates forces that allow a structure to stand, data and documentation process may be missing or incomplete *Attempts to use appropriate vocabulary 	<ul style="list-style-type: none"> *With significant help, investigates the forces that allow a structure to stand *Defines live and dead load, tension, compression)
SC.E.ST.02	Recognizes and explains how and why different materials are used for different jobs	<ul style="list-style-type: none"> *Presents real-world examples of different materials that are used for different jobs 	<ul style="list-style-type: none"> *Gives real-world examples of different materials that are used for different jobs OR *Uses different materials in a design challenge explaining the trade-offs in the decision 	<ul style="list-style-type: none"> *Considers trade-offs when using different materials in a design 	<ul style="list-style-type: none"> *Identifies a material that is used for multiple purposes (e.g. latex, magnets, bamboo, lasers, isotopes, nanotechnology)
SC.E.ST.03	Develop an understanding of the science and engineering of materials by applying knowledge for a specific purpose	<ul style="list-style-type: none"> *Successfully completes a design challenge with all appropriate calculations and documentation of engineering process is recorded and complete AND significantly exceeds expectations 	<ul style="list-style-type: none"> *Successfully completes a design challenge *Calculations and documentation of engineering process is recorded and complete 	<ul style="list-style-type: none"> *In a group or working alone, attempts to complete a design challenge. (i.e. Structure is complete OR calculations and/or documentation of process are missing or incomplete) 	<ul style="list-style-type: none"> *With significant help, completes a design challenge
SC.E.ST.04	Determine what physical and environmental factors need to be considered in building a stable structure	<ul style="list-style-type: none"> * Presents the physical and environmental factors that were considered on a new or existing structure AND identifies how and when Newton's three Laws of Motion would impact a new structure 	<ul style="list-style-type: none"> * Identifies physical AND environmental factors that are considered on a new or existing structure *Identifies how and when Newton's 1st and 3rd Laws of Motion impact a new structure 	<ul style="list-style-type: none"> * Identifies physical OR environmental factors that are considered on a new or existing structure *Defines Newton's 1st and 3rd Laws of Motion 	<ul style="list-style-type: none"> *With significant help, identifies physical AND environmental factors that are considered on a new or existing structure
SC.E.ST.05	Recognizes and explains why perfectly designed solutions do not exist. (i.e. examines trade-offs in their design)	<ul style="list-style-type: none"> *Examines the design aspect of an original structure, explaining trade-offs made for the success of the structure 	<ul style="list-style-type: none"> *Examines the design aspect of an original structure, listing trade-offs made for the success of the structure 	<ul style="list-style-type: none"> *Researches and explains why no design is perfect *Defines trade-offs 	<ul style="list-style-type: none"> *With significant help, explains why no design is perfect

SC.E.ME.01	Describes how energy (i.e. heat, light, chemical, electrical, mechanical) can change form (i.e. kinetic, potential) and is still energy and matter are conserved	<ul style="list-style-type: none"> *Conducts experiments with energy transfer and describes 6 types of energy transfer *Diagrams matter cycle (e.g. decomposition, digestion, water) *Describes first law of thermodynamics in detail 	<ul style="list-style-type: none"> *Conducts experiments with energy transfer and describes at least 4 types of energy transfer *Diagrams energy flow within an ecosystem *Illustrates a matter cycle (e.g. decomposition) *Defines first law of thermodynamics 	<ul style="list-style-type: none"> *Conducts experiments with energy transfer and describes at least 2 types of energy transfer. *Defines energy flow *Defines a matter cycle *Rephrases that energy flows and matter cycles, but is conserved within an ecosystem 	<ul style="list-style-type: none"> *Conducts experiments with energy transfer and describes 1 type of energy transfer *Lists steps in energy flow *List steps in matter cycles *States energy flows and matter cycles, but is conserved within an ecosystem
SC.E.ME.02	Illustrates the water cycle and applies knowledge of the water cycle; explaining common procedures for purification of contaminated water	<ul style="list-style-type: none"> *Illustrates multiple connections between the water and rock cycles *Describes seasonal changes of salinity and turbidity of water *Researches and reports on three water issues in the United States due to water cycle abnormalities *Researches and presents on a geologically historic event which resulted in water loss or abundance 	<ul style="list-style-type: none"> *Illustrates the water cycle AND identifies how the water cycle is used for water purification *Researches and presents two water issues in the United States due to water cycle abnormalities both long and short term (e.g. glaciation, ice age desertification, flooding) *Researches and reports a major geologically historic event which resulted in water loss/abundance (e.g. Lake Bonneville Flood, Lake Missoula Flood, Little Ice Age) 	<ul style="list-style-type: none"> *Illustrates the water cycle OR identifies how the water cycle is the used for water purification *Researches a water issue in the United States due to water cycle abnormalities, both long and short term (e.g. glaciation, ice age desertification, flooding) *Researches a local geologically historic event which resulted in water loss/abundance (glaciation, desertification, ice age, flooding) 	<ul style="list-style-type: none"> *Illustrates the water cycle *Identifies methods to purify water *Lists several geologically historical events in which the water cycle changed the surface of the Earth
SC.E.ME.03	Describes the rock cycle and its relationship to soil and earth materials (i.e. rocks, sand, silt, clay) how they can be used in land reclamation	<ul style="list-style-type: none"> *Describes all phases of the rock cycle *Describes mechanisms for physical changes (rock) *Describes igneous, metamorphic and sedimentary rock *Researches ways that earth materials are used for land reclamation 	<ul style="list-style-type: none"> *Using a graphic organizer, models all phases of the rock cycle AND identify mechanisms for physical change *Identifies examples of rock for all three types: igneous, metamorphic and sedimentary *Suggests ways to use earth materials for land reclamation 	<ul style="list-style-type: none"> *Identify two phases of the rock cycle AND the mechanisms for physical change *Defines and gives an example of igneous, metamorphic and sedimentary rock. *Identifies sand, silt and clay as components of soils 	<ul style="list-style-type: none"> *Define the rock cycle, locating the location of soil in the cycle *Defines and gives an example of igneous, metamorphic and sedimentary rock, with significant help *Defines land reclamation
SC.E.ME.04	Investigates, using models to compare and contrast the disposal of waste materials methods; including landfill, dumps, and recycling	<ul style="list-style-type: none"> *Designs an appropriate system for waste management for school or home OR * Helps others use inquiry to compare and contrast the effectiveness of different waste disposal methods 	<ul style="list-style-type: none"> *Through inquiry, compares and contrasts the effectiveness of different waste disposal methods 	<ul style="list-style-type: none"> *Compares and contrasts different methods to manage waste disposal * Compares and contrasts what methods for waste management disposal are available in the Anchorage Bowl Area 	<ul style="list-style-type: none"> *Identifies different methods to manage waste disposal *Identifies what methods for waste management disposal are available in the Anchorage Bowl Area

SC.E.SP.01	Asks testable questions and states relevance to science inquiry	<ul style="list-style-type: none"> *Describes testable and non-testable questions *Formulates AND defends testable questions derived by emerging patterns in scientific inquiry 	<ul style="list-style-type: none"> *Compares and contrasts testable and non-testable questions *Formulates testable questions that lead to scientific inquiry 	<ul style="list-style-type: none"> *Defines testable and non-testable questions 	<ul style="list-style-type: none"> *Recognizes a testable question
SC.E.SP.02	Predict outcome and develop a hypothesis based on a testable question	<ul style="list-style-type: none"> *Develops and defends a hypothesis based on a testable question *Predicts and defends an outcome based on emerging patterns in a complex system 	<ul style="list-style-type: none"> *Develops a hypothesis based on a testable question *Predicts an outcome based on evidence 	<ul style="list-style-type: none"> *Develops a hypothesis *Predicts an outcome based on background knowledge 	<ul style="list-style-type: none"> *Develops a hypothesis *Predicts an outcome based on background knowledge
SC.E.SP.03	Collaborate to design and conduct repeatable and controlled inquiries and investigations	<ul style="list-style-type: none"> *Designs and conducts investigations in a group multiple times that are valid and reliable *Reflects on investigations as a group *Identifies control groups and dependent and independent variables 	<ul style="list-style-type: none"> * As a group, designs investigations that are valid or reliable using all steps of a scientific method *Conducts investigations as designed *Identifies experimental AND control groups *Identifies dependent and independent variables 	<ul style="list-style-type: none"> *Designs investigations as a group using one or more steps of a scientific method *Conducts investigations as designed *Identifies dependent and independent variables AND experimental control 	<ul style="list-style-type: none"> *Designs investigations as a group *Conducts investigations with changes to design *Identifies variables and experimental control
SC.E.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"> *Designs and conducts investigations in a group multiple times that are valid and reliable *Reflects on the investigation as a group 	<ul style="list-style-type: none"> *Designs investigations as a group that is valid or reliable using all steps of a scientific method to collect data *Conducts investigations as designed *Protocol attempts to mitigate the effect of sources of error on the validity of the data collected 	<ul style="list-style-type: none"> *Designs investigations as a group using one or more steps of a scientific method *Conducts investigations as designed *Identifies sources of errors in the experiment 	<ul style="list-style-type: none"> *Designs investigations as a group *Conducts investigations with changes to design *Identifies variables
SC.E.SP.05	Analyzes data statistically (i.e. mean, median, mode and range)	<ul style="list-style-type: none"> *Teaches others how to analyze data statistically using mean, median, mode and range 	<ul style="list-style-type: none"> *Compare and contrast mean, median, mode and range *Organizes data and calculates range, mean, median and mode when appropriate 	<ul style="list-style-type: none"> *Defines mean, median, mode AND range *Describes how the data is organized *Explains how to calculate range, mean, median AND mode 	<ul style="list-style-type: none"> *Defines mean *Describes why data should be organized *Describes how to calculate mean, with significant help
SC.E.SP.06	Assess the reliability of the data and draw conclusions with reference to hypothesis	<ul style="list-style-type: none"> *Constructs and defends conclusions based on data and observations *Includes more than one specific reason to support or reject hypothesis *Reflects on study to make appropriate revisions 	<ul style="list-style-type: none"> *Constructs conclusions based on data and observations *Includes detailed evaluation of hypothesis *Includes one specific reason to support or reject hypothesis 	<ul style="list-style-type: none"> *Constructs conclusions based on data OR observations *Includes broad evaluation of hypothesis *States if hypothesis is supported or rejected without rationale 	<ul style="list-style-type: none"> *Constructs conclusions *Includes an evaluation of hypothesis, with significant help

SC.E.SP.07	Communicate experimental findings, the limitations in the use of models or protocols and differences in the results of repeated experiments	*Significantly helps others to prepare and present a proficient presentation OR peer evaluates a presentation prior to presentation	*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	*Working with a group or alone, prepares a multi-media presentation outlining the steps of a scientific method used in the investigation *States importance of repeated trials	*Working with a group, prepare and present their findings on a scientific investigation *Conclusions are described AND data trends are addressed *States importance of repeated trials
SC.E.SP.08	Utilize scientific equipment and materials in an appropriate and safe manner	*Describes and models proper use of and care of lab equipment *Teaches others how to use lab equipment appropriately and how to be safe in a lab setting	*Describes proper use and care of lab equipment *Consistently uses lab equipment safely and for the intended purpose * Watches for safety violations and helps others to remain safe in a lab setting	*Identifies proper use and care of lab equipment *Often uses lab equipment for the intended purpose *Behavior some-times inappropriate for a lab setting (e.g. horseplay, food in lab area)	*Identifies proper use of lab equipment *Occasionally uses lab equipment for the intended purpose *Behavior often inappropriate for a lab setting. (e.g. horseplay, food in lab area)
SC.E.SP.09	Maintain a science notebook that explains scientific ideas, solutions, and methods AND documents scientific work	*Science notebook exceeds expectations in a significant way	*Science notebook is organized, complete and provides evidence of scientific work	*Science notebook shows evidence of scientific work and reflection	*Science notebook is missing or incomplete
SC.E.SP.10	Design and conduct a simple investigation about the local environment	*Designs and conducts a local study to gain scientific knowledge of environment *Presents and defends conclusions to multiple members of the community	*Designs and conducts a local study of interest *Presents conclusions of study	*Designs a local study of interest *Conducts a local study of interest	*Designs a local study of interest
SC.E.SP.11	Describes the affect of public policy on one's own life using scientific knowledge and technology	*Presents 3 specific public policies that affect own life to members of the community *Uses appropriate scientific knowledge in presentation *Consistently uses appropriate scientific and technological terminology	*Presents 2 specific public policies that affect own life, to peers *Shows scientific knowledge in presentation *Uses appropriate technology *Often uses appropriate scientific and technological vocabulary	*Researches a specific public policy that affects own life *Shows some scientific knowledge *Uses technology to research or to prepare a presentation *Uses some appropriate scientific and technological vocabulary	*Describes a public policy that affects own life *Shows some scientific knowledge *Uses some appropriate scientific or technological vocabulary
SC.E.SP.12	Investigates and describes how past scientific discoveries, inventions or breakthroughs have impacted our lives and society	*Presents a historical scientific event AND directly connects this event to our society today *Presents on the life AND career of a historically significant Scientist	*Describes a historical scientific event and directly connects this event to own self or our society today *Describes the life AND career of a historically significant Scientist	*Describes a historical scientific event *Describes the career of a historically significant Scientist	*Identifies a historical scientific event (i.e. discovery, invention or breakthrough)

