FOSS and SEEd Standards Alignment
Fourth Grade

Strand 4.1: ORGANISMS FUNCTIONING IN THEIR ENVIRONMENT

Through the study of organisms, inferences can be made about environments both past and present. Plants and animals have both internal and external structures that serve various functions for growth, survival, behavior, and reproduction. Animals use different sense receptors specialized for particular kinds of information to understand and respond to their environment. Some kinds of plants and animals that once lived on Earth can no longer be found. However, fossils from these organisms provide evidence about the types of organisms that lived long ago and the nature of their environments. Additionally, the presence and location of certain fossil types indicate changes that have occurred in environments over time.

FOSS	STANDARDS
Environments **Investigations 1: Environmental Factors** **Part 1:** Observing Mealworms **SEP: Planning and carrying out investigations, Analyzing and interpreting data, constructing explanations, Obtaining, evaluating and communicating information** CCC: Structure and function, Cause and effect **Standard Content:** An environment is everything living and nonliving that surrounds and influences an organism. A relationship exists between environmental factors and how well organisms grow. Animals have structures and behaviors that function to support survival, growth and reproduction. These include sensory system structures. **Part 2:** Designing an Isopod **SEP: Asking questions, Developing and using models, Planning and carrying out investigations, Analyzing and interpreting data,**	**4.1.1 Construct an explanation** from evidence that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. Emphasize how structures support an organism's survival in its environment and how internal and external structures of plants and animals vary within the same and across multiple Utah environments. Examples of structures could include thorns on a stem to prevent predation or gills on a fish to allow it to breathe underwater. (LS1.A) **4.1.2 Develop and use a model** of a system to describe how animals receive different types of information from their environment through their senses, process the information in their brain, and respond to the information. Emphasize how animals are able to use their perceptions and memories to guide their actions. Examples could include models that explain how

Constructing explanations, Engaging in argument from evidence, Obtaining, evaluating and communicating information CCC: Cause and effect, Structure and function **Standard Content:** Designing and investigation involves controlling the factors so that the effect of one factor can be observed. Every organism has a set of preferred environmental conditions. Isopods prefer moist environments; isopods prefer dark environments. **Part 3:** Leaf-Litter Critters **SEP: Asking questions, Planning and carrying out investigations, Analyzing and interpreting data, Obtaining, evaluating and communicating information** CCC: Structure and function, System and system models **Standard Content:** Every organism has a set of preferred environmental conditions. An environment is everything living and nonliving that surrounds and influences an organism. A relationship exists between environmental factors and how well organisms grow.	animals sense and then respond to different aspects of their environment such as sounds, temperature, or smell. (LS1.D)
Environments **Investigations 2: Ecosystems** **Part 1:** Designing an Aquarium **SEP: Planning and carrying out investigations, Constructing explanations, Obtaining, evaluating and communicating information** CCC: System and system models **Standard Content:** Aquatic environments include living and nonliving factors (water and temperature). Organisms that live in water have structures that function to meet their needs. The Interactions of organisms with one another and with the nonliving environments is an ecosystem.	**4.1.1 Construct an explanation** from evidence that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. Emphasize how structures support an organism's survival in its environment and how internal and external structures of plants and animals vary within the same and across multiple Utah environments. Examples of structures could include thorns on a stem to prevent predation or gills on a fish to allow it to breathe underwater. (LS1.A) **4.1.2 Develop and use a model** of a system to describe how animals receive different types of information from their environment through their senses, process the information in their brain, and respond to the information. Emphasize how

Part 2: Food Chains and Food Chains **SEP: Analyzing and interpreting data, Engaging in argument from evidence, Obtaining, evaluating and communicating information** CCC: Structure and function, Energy and matter, System and system models **Standard Content:** Organisms have structures that allow them to interact in feeding relationships they may compete for resources. Producers make their own food, which is also used by animals (consumers). Decomposers eat and recycle the nutrients in the system. Animals have different systems for obtaining oxygen. **Part 3:** Population Simulation **SEP: Developing and using models, Analyzing and interpreting data, Constructing explanations, Obtaining, evaluating and communicating information** CCC: System and system models, Stability and change, Energy and matter **Standard Content:** Organisms interact in feeding relationships in ecosystems. When the environment changes, some plants and animals survive and reproduce, others move to new locations and some die. **Part 4:** Sound Off **SEP: Planning and carrying out investigations, Constructing explanations, Obtaining, evaluating and communicating information.** CCC: **Standard Content:** Animals communicate to warn others of danger, scare predators away, or locate others of their kind, including family members. Organisms have sensory systems to gather information	animals are able to use their perceptions and memories to guide their actions. Examples could include models that explain how animals sense and then respond to different aspects of their environment such as sounds, temperature, or smell. (LS1.D)

about their environment and act on it. Animals detect sounds, interpret and act on them.	
Environments **Investigations 3: Brine Shrimp Hatching** **Part 1:** Setting up the Experiment **SEP: Developing and using models, Planning and carrying out investigations, Using mathematics and computational thinking, Constructing explanations, Obtaining, evaluating and communicating information** CCC: System and system models, structure and function **Standard Content:** Brine shrimp are crustaceans that live in marine or salt pond environments. An environmental factor is one part of an environment. It can be living and nonliving. Organisms have ranges of tolerance for environmental factors. **Part 2:** Determining the Range of Tolerance **SEP: Developing and using models, Planning and carrying out investigations, Analyzing and interpreting data, Using mathematics and computational thinking, Constructing explanations, Obtaining, evaluating and communicating information** CCC: Cause and Effect **Standard Content:** Within the range of tolerance, there are optimum conditions that produce maximum reproduction and growth. Brine shrimp eggs can hatch in a range of salt concentrations but more hatch in environments with optimum salt concentration. When environments change, some plants and animals survive and reproduce while others move to new locations and some die. **Part 3:** Determining Viability **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations, Engaging in argument**	**4.1.1 Construct an explanation** from evidence that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. Emphasize how structures support an organism's survival in its environment and how internal and external structures of plants and animals vary within the same and across multiple Utah environments. Examples of structures could include thorns on a stem to prevent predation or gills on a fish to allow it to breathe underwater. (LS1.A)

from evidence, Obtaining, evaluating and communicating information CCC: Cause and effect **Standard Content:** Within a range of tolerance, there are optimum conditions that produce maximum reproduction and growth. Brine shrimp eggs can hatch in a range of concentrations, but more hatch in environments with optimum salt concentrations. When environments change, some plants and animals will survive and reproduce; others move to new locations and some die. Humans impact natural environments. **Part 4:** Variations in Populations **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations, Obtaining, evaluating and communicating information** CCC: System and system models **Standard Content:** Individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in surviving and reproducing.	
Environments **Investigations 4: Range of Tolerance** **Part 1:** Water and Salt Tolerance and Plants **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations, Engaging in argument from evidence, Obtaining, evaluating and communicating information.** CCC: Cause and effect **Standard Content:** Every organism has a range of tolerance for each factor in its environment. Organisms have specific requirements for successful growth, development and reproduction. A relationship exists between environmental factors and how well organisms grow. Optimum	**4.1.1 Construct an explanation** from evidence that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. Emphasize how structures support an organism's survival in its environment and how internal and external structures of plants and animals vary within the same and across multiple Utah environments. Examples of structures could include thorns on a stem to prevent predation or gills on a fish to allow it to breathe underwater. (LS1.A)

conditions are those most favorable to an organism. **Part 2:** Plant Patterns **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations, Obtaining, evaluating and communicating information** CCC: Patterns **Standard Content:** Organisms have specific requirements for successful growth, development and reproduction. A relationship exists between environmental factors and how well organisms grow. **Part 3:** Plant Adaptations **SEP: Obtaining, evaluating and communicating information.** CCC: Structure and Function **Standard Content:** Adaptations are structures and behaviors of an organism that helps it survive and reproduce. A relationship exists between environmental factors and how well organisms grow.	
Soils Rocks and Landforms Investigation 2, Part 4 "Fossil Evidence" **Part 4:** Fossil Evidence **SEP: Developing and using models, Constructing explanations, Obtaining, evaluating and communicating information.** CCC: Cause and effect, Stability and change **Standard Content:** Fossils provide evidence of organisms that lived long ago as well as clues to changes in the landscape and past environments	**4.1.3 Analyze and interpret data** from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A) **4.1.4 Engage in Argument** from evidence based on patterns in rock layers and fossils found in those layers to support an explanation for how an environment has changed over time. Emphasize the relationship between fossils and past environments. Examples could include tropical plant fossils found

	in Arctic areas and rock layers with marine shell fossils found above rock layers with land plant fossils. (ESS1.C)

Strand 4.2: ENERGY TRANSFER

Energy is present whenever there are moving objects, sound, light, or heat. The faster a given object is moving, the more energy it possesses. When objects collide, energy can be transferred from one object to another causing the objects' motions to change. Energy can also be transferred from place to place by electrical currents, heat, sound, or light. Devices can be designed to convert energy from one form to another.

Strand 4.3: WAVE PATTERNS

Waves are regular patterns of motion that transfer energy and have properties such as amplitude (height of the wave) and wavelength (spacing between wave peaks). Waves in water can be directly observed. Light waves cause objects to be seen when light reflected from objects enters the eye. Humans use waves and other patterns to transfer information.

FOSS	STANDARDS
Energy **Investigation 1: Energy and Circuits** **Part 1:** Lighting a Bulb **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations, Engaging in argument from evidence, Obtaining, evaluating and communicating information** CCC: Cause and effect, System and system model, Energy and matter, Cause and effect **Standard Content:** An electric circuit is a system that includes a complete pathway through which electric current flows from an energy source to its components. Electricity transfers energy that can produce heat, light, sound, and motion. Electricity can be produced from a variety of sources. Conductors are materials through which	**4.2.3 Plan and carry out an investigation** to gather evidence from observations that energy can be transferred from place to place by sound, light, heat, and electrical currents. Examples could include sound causing objects to vibrate and electric currents being used to produce sound or light. (PS3.A, PS3.B) **4.2.4 Design** device that converts energy from one form to another. Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution. Emphasize identifying the initial and final forms of energy. Examples could include solar ovens that convert light energy to heat energy or a simple alarm system that converts

electric current can flow; all metals are conductors. **Part 2:** Conductors and Circuits **SEP: Asking questions, Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations, Obtaining, evaluating and communicating information** CCC: Cause and effect, System and system models, Energy and matter **Standard Content:** An electric circuit is a system that includes a complete pathway through which electric current flows from an energy source to its components. Electricity transfers energy that can produce heat, light, sound, and motion. Electricity can be produced from a variety of sources. Conductors are materials through which electric current can flow; all metals are conductors. **Part 3:** Series and Parallel Circuits **SEP: Asking questions, Developing and using models, Planning and carrying out investigations, Analyzing interpreting data, Constructing explanations and designing solutions** CCC: System and system models, Cause and effect, Energy and matter **Standard Content:** In a series circuit, there is a single pathway from energy source to the components. In a parallel circuit, each component has its own direct pathway to the energy source. Two bulbs can be lit brightly using parallel circuitry, one in which each bulb has direct access to energy sources. **Part 4:** Solving the String of Lights Problem **SEP: Asking questions and defining problems, planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations and designing solutions, Engaging in argument from evidence** CCC: Cause and effect, System and system models	motion energy into sound energy. (PS3.B, PS3.D, ETS1.A, ETS1.B, ETS1.C)

Standard Content: In a series circuit, all the lights share a single pathway; if one light burns out, the current stops flowing causing all the bulbs to go out. In a parallel circuit, each light has its own pathway to the source; if one light burns out, current continues flowing, and the remaining bulbs continue to shine.	
Energy **Investigation 2: The Force of Magnetism** **Part 1:** Magnets and Materials **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations** CCC: Patterns, Cause and effect **Standard Content:** Magnets interact with each other and with some materials. Magnets stick to (attract) object that contain iron. Iron is the only common metal that sticks to magnets. (Steel is a material made mostly of iron). **Part 2:** Magnetic Field **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations, Obtaining, evaluating and communicating information** CCC: Cause and effect **Standard Content:** Magnets surrounded by an invisible magnetic field, which acts through space and through most materials. When an object enters a magnetic field, the field induces magnetism in the iron object, and the object becomes a temporary magnet. All magnets have two poles, a north pole at one end (side) and a south pole at the other end (side). Like poles of magnets repel each other and opposites attract. **Part 3:** Magnetic Force **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Using mathematics and computational**	**4.2.4 Design** device that converts energy from one form to another. Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution. Emphasize identifying the initial and final forms of energy. Examples could include solar ovens that convert light energy to heat energy or a simple alarm system that converts motion energy into sound energy. (PS3.B, PS3.D, ETS1.A, ETS1.B, ETS1.C)

thinking, Constructing explanations, Obtaining, evaluating and communicating information CCC: Cause and effect, patterns **Standard Content:** The magnetic force acting between magnets declines as the distance between them increases. Earth has a magnetic field.	
Energy **Investigation 3: Electromagnets** **Part 1:** Building Electromagnet SEP**: Developing and using models, Planning and carrying out investigations, Constructing explanations and designing solutions, Obtaining and evaluating and communicating information** CCC: Cause and effect, System and system model, System and system models, Energy and matter. **Standard Content:** A magnetic field surrounds a wire through which electric current is flowing. The magnetic field produced by a current - carrying wire can induce magnetism in a piece of iron or steel. **Part 2:** Changing the Strength **SEP: Developing and using models, Planning and carrying out investigations, Analyzing and interpreting data, Using mathematical and computational thinking, Constructing explanations, Obtaining and evaluating and communicating information** CCC: Patterns, Cause and effect, Energy and matter **Standard Content:** An electromagnet is made by sending electric current through an insulated wire wrapped around an iron core. The number of winds of wire in an electromagnet coil affects the strength of the magnetism induced in the core (more winds = more magnetism). The amount of electric current flowing in an	**4.2.3 Plan and carry out an investigation** to gather evidence from observations that energy can be transferred from place to place by sound, light, heat, and electrical currents. Examples could include sound causing objects to vibrate and electric currents being used to produce sound or light. (PS3.A, PS3.B) **4.2.4 Design** device that converts energy from one form to another. Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution. Emphasize identifying the initial and final forms of energy. Examples could include solar ovens that convert light energy to heat energy or a simple alarm system that converts motion energy into sound energy. (PS3.B, PS3.D, ETS1.A, ETS1.B, ETS1.C) **4.3.3 Design a solution** to an information transfer problem using wave patterns. *Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution.* Examples could include using light to transmit a message in Morse code or using lenses and mirrors to see objects that are far away. (PS4.C, ETS1.A, ETS1.B, ETS1.C)

electromagnet circuit affects the strength of the magnetism in the core (more current = stronger magnetism). **Part 3:** Reinventing the Telegraph **SEP: Defining problems, constructing explanations and designing solutions, Obtaining, evaluating and communicating information** CCC: System and system models, cause and effect **Standard Content:** A telegraph system is an electromagnet - based technology used for long distance communication.	
Energy **Investigation 4: Energy Transfer** **Part 1:** Presence of Energy **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Engaging in argument from evidence, Obtaining, evaluating and communicating information** CCC: System and system models, Energy and matter **Standard Content:** Energy is evident whenever there is motion, electric current, sound, light or heat. Energy can be transferred from place to place. Energy can be transferred by using fossil fuels or renewable sources. As the need for energy increases, the use of renewable sources will help meet energy needs. **Part 2:** Rolling Balls Down Slopes **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations, Engaging in argument from evidence, Obtaining, evaluating and communicating information** CCC: Patterns, Cause and effect **Standard Content:** Kinetic energy is energy of motion; potential energy is energy of position or condition. The faster an object is	**4.2.1 Construct an explanation** to describe the cause and effect relationship between the speed of an object and the energy of that object. Emphasize using qualitative descriptions of the relationship between speed and energy like fast, slow, strong, or weak. An example could include a ball that is kicked hard has more energy and travels a greater distance than a ball that is kicked softly. (PS3.A) **4.2.2 Ask questions** and make observations about the changes in energy that occur when objects collide. Emphasize that energy is transferred when objects collide and may be converted to different forms of energy. Examples could include changes in speed when one moving ball collides with another or the transfer of energy when a toy car hits a wall. (PS3.B, PS3.C) **4.2.3 Plan and carry out an investigation** to gather evidence from observations that energy can be transferred from place to place by sound, light, heat, and electrical currents. Examples could include sound causing objects to vibrate and electric currents being used to produce sound or light. (PS3.A, PS3.B)

moving the more kinetic energy it has. Objects at higher positions have more potential energy. **Part 3:** Collisions **SEP: Asking questions, Planning and carrying out investigations, Analyzing and interpreting data, Using mathematical and computational thinking, Constructing explanations, Engaging in argument from evidence, Obtaining, evaluating and communicating information** CCC: Patterns, Energy and matter **Standard Content:** When objects collide, energy cna transfer from between objects, thereby changing their motion. The faster an object is moving the more kinetic energy it has. When two objects interact, each one exerts a force on the other and these forces can transfer energy. Objects at higher heights have more potential energy.	
Energy **Investigation 5: Waves** **Part 1:** Forms of Waves **SEP: Developing and using models, Using mathematical and computational thinking, Constructing explanations, Obtaining, evaluating and communicating information** CCC: Patterns, Cause and effect, System and system models, Energy and matter **Standard Content:** Waves are repeating patterns of motion that transfer energy from place to place. There are sound waves, light waves, radio waves, microwaves and ocean waves. Waves have properties - amplitude, wavelength and frequency. Some electromagnetic waves can be detected by designed technologies (radio waves). **Part 2:** Light Travels	**4.2.3 Plan and carry out an investigation** to gather evidence from observations that energy can be transferred from place to place by sound, light, heat, and electrical currents. Examples could include sound causing objects to vibrate and electric currents being used to produce sound or light. (PS3.A, PS3.B) **4.2.4 Design** device that converts energy from one form to another. Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution. Emphasize identifying the initial and final forms of energy. Examples could include solar ovens that convert light energy to heat energy or a simple alarm system that converts motion energy into sound energy. (PS3.B, PS3.D, ETS1.A, ETS1.B, ETS1.C)

SEP: Developing and using models, Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations, Obtaining, evaluating and communicating information CCC: Cause and effect, System and system models, Energy and matter **Standard Content:** Light travels in straight lines and can reflect (bounce) off surfaces. An object is seen only when light from that object enters and is detected by an eye. Light can refract (change direction) when it passes from one transparent material to another. **Part 3:** Engineering with Solar Cells **SEP: Asking questions and defining problems, Constructing explanations and designing solutions, Obtaining, evaluating and communicating information** CCC: Cause and effect, System and system models, **Standard Content:** The energy of two energy sources (D cell or solar cells) adds when they are wired in series, delivering more power than a single cell. Two cells in parallel have the same power as a single cell. Humans impact the environment by using natural resources to produce energy. Some resources are renewable over time and others are not.	**4.3.1 Develop and use a model** to describe the regular patterns of waves. Emphasize patterns in terms of amplitude and wavelength. Examples of models could include diagrams, analogies, and physical models such as water or rope. (PS4.A) **4.3.2 Develop and use a model** to describe how visible light waves reflected from objects enter the eye causing objects to be seen. Emphasize the reflection and movement of light. The structure and function of organs and organ systems and the relationship between color and wavelength will be taught in Grades 6 through 8. (PS4.B) **4.3.3 Design a solution** to an information transfer problem using wave patterns. *Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution.* Examples could include using light to transmit a message in Morse code or using lenses and mirrors to see objects that are far away. (PS4.C, ETS1.A, ETS1.B, ETS1.C)

Strand 4.4: OBSERVABLE PATTERNS IN THE SKY

The Sun is a star that appears larger and brighter than other stars because it is closer to Earth. The rotation of Earth on its axis and orbit of Earth around the Sun causes observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the Sun and stars at different times of the day, month, and year.

FOSS	STANDARDS

Earth and Sun **Investigation 1: The Sun** **Part 1:** Shadow Shifting **SEP: Developing and using models, Planning and carrying out investigations, Analyzing and interpreting data, Constructing explanations** CCC: Patterns **Standard Content:** Shadows are the dark areas that result when light is blocked. Shadows change during the day because the position of the sun changes in the sky. **Part 2:** Sun Tracking **SEP: Developing and using models, Planning and carrying out investigations, Analyzing and interpreting data, Using mathematics and computational thinking, Constructing explanations, Obtaining, evaluating and communicating information** CCC: Cause and effect, System and system models, Patterns **Standard Content:** Shadows change during the day because the position of the Sun changes in the sky. The length and direction of a shadow depends on the Sun's position in the sky. These daily shadow patterns are observable and predictable. **Part 3:** Day and Night **SEP: Asking questions, Developing and using models, Analyzing and interpreting data, Using mathematical and computational thinking, Constructing explanations, Obtaining, evaluating and communicating information** CCC: Cause and effect, System and system models **Standard Content:** Day is the half of Earth's surface being illuminated by sunlight; night is half of Earth's surface in its own shadow. The cyclical change between day and night is the	**4.4.2 Analyze and interpret data** of observable patterns to show that the Earth rotates on its axis and revolves around the Sun. Emphasize patterns that provide evidence of Earth's rotation and orbits around the Sun. Examples of patterns could include day and night, daily changes in length and direction of shadows, and seasonal appearance of some stars in the night sky. Earth's seasons and its connection to the tilt of Earth's axis will be taught in Grades 6 through 8. (ESS1.B)

result of Earth's rotating on its own axis in association with the stationary Sun, Earth's star.	
Earth and Sun **Investigation 2: Planetary Systems** **Part 1:** Night Sky Observation **SEP: Planning and carrying out investigations, Analyzing and interpreting data, Obtaining, evaluating and communicating information** CCC: Patterns, Scale Proportion and quantity, System and system models **Standard Content:** The solar system includes a star, the Sun, and the objects that orbit it, including Earth, the Moon, seven other planets and their satellites, and smaller objects. **Part 2:** How Big and How Far? **SEP: Planning and carrying out investigations, Developing and using models, Using mathematics and computational thinking, Constructing explanations, Engaging in argument from evidence, Obtaining, evaluating and communicating information** CCC: Scale proportion and quantity **Standard Content:** The Moon is much smaller than Earth and orbit at a distance equal is about 30 Earth diameters. The Sun is 12,000 Earth diameters away from Earth and is more than 100 times larger than Earth. **Part 3:** Phases of the Moon (optional) **SEP: Developing and using models, Analyzing and interpreting data, Constructing explanations, Obtaining, evaluating, and communicating information** CCC: **Standard Content:** The Moon changes its appearance, or	**4.4.1 Construct an explanation** that differences in the apparent brightness of the Sun compared to other stars is due to the relative distance (scale) of stars from Earth. Emphasize relative distance from Earth. (ESS1.A) **4.4.2 Analyze and interpret data** of observable patterns to show that the Earth rotates on its axis and revolves around the Sun. Emphasize patterns that provide evidence of Earth's rotation and orbits around the Sun. Examples of patterns could include day and night, daily changes in length and direction of shadows, and seasonal appearance of some stars in the night sky. Earth's seasons and its connection to the tilt of Earth's axis will be taught in Grades 6 through 8. (ESS1.B)

phase, in a regular pattern over 4 weeks. Moon phase is the portion of the illuminated half of the Moon that is visible from Earth. **Part 4:** The Solar System **SEP: Developing and using models, Analyzing and interpreting data, Engaging in argument from evidence, Obtaining, evaluating and communicating information** CCC: Patterns, System and system models **Standard Content:** The solar system includes a star, the Sun, and the other objects that orbit it, including Earth, the Moon, seven other planets, their satellites and smaller objects. Gravity is pulling force between two masses; it is the force that pulls things towards the center of the Earth. The pulling force of gravity keeps the Sun, planets, and other objects in orbit by continuously changing their direction of travel. **Part 5:** Stars **SEP: Developing and using models, Constructing explanations, Obtaining, evaluating and communicating information** CCC: Patterns, Cause and effect, System and system models **Standard Content:** Stars are at different distances from Earth. The Sun is the closest star to Earth so it appears brighter and larger than other stars. A great deal of light travels through space to Earth from the Sun and from distant stars. Groups of stars form patterns called constellations. Stars (constellations) appear to move together across the night sky because of Earth's rotation. The side of Earth facing the Sun is always in daylight; the side facing away from the Sun is always in darkness. Because of the brightness of the Sun, we can only se	