



**Zula Exploration Mission Modules
Missouri Science Grade Level Expectations
Alignment Overview**

Module Key:

1. Simple machines
2. Force
3. Habitats
4. Plants, Animals, and Life Cycles
5. Water
6. Light
7. Matter
8. Mixtures, Solutions, and Chemical Reactions

FK – Future Kit

Kindergarten

Strand 1: Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

A. Objects and the materials they are made of, have properties that can be used to describe and classify them.

a. Describe physical properties of objects (i.e., size, shape, color, mass) by using the senses, simple tools (e.g., magnifiers, equal arm balances), and/or nonstandard measures (e.g., bigger/smaller; more/less) **ALL**

b. Identify materials (e.g., cloth, paper, wood, rock, metal) that make up an object and some of the physical properties of the materials (e.g., color, texture, shiny/dull, odor, sound, taste, flexibility) **ALL**

c. Sort objects based on observable physical properties (e.g., size, material, color, shape, mass) **1, 3, 8, Many FK**

2. Energy has a source, can be stored, and can be transferred but is conserved within a system

A. Forms of energy have a source, a means of transfer (work and heat), and a receiver

a. Identify the sounds and their source of vibrations in everyday life (e.g., alarms, car horns, animals, machines, musical instruments) **FK - Sound**

b/ Compare different sounds (i.e., loudness, pitch, rhythm) **FK - Sound**

c. Identify the ear as a receiver of vibrations that produce sound **FK - Sound**

Strand 2: Properties and Principles of Force and Motion

1. The motion of an object is described by its change in position relative to another object or point

A. The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference) **2**

2. Forces affect motion

A. Forces are classified as either contact (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude

a. Identify ways (push, pull) to cause some objects to move by touching them **1, 2**

b. Identify magnets cause some objects to move without touching them **FK – Invisible Forces**

Strand 3: Characteristics and Interactions of Living Organisms

1. There is a fundamental unity underlying the diversity of all living organisms

D. Plants and animals have different structures that serve similar functions necessary for the survival of the organism

a. Observe and compare the structures and behaviors of different kinds of plants and animals **3, 4, FK – Animal Adaptations**

3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through productive processes

- D. There is heritable variation within every species of organism
 - a. Identify that living things have offspring based on the organisms' physical similarities and differences **4, FK - Animal Adaptations**

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments

1. Organisms are interdependent with one another and with their environment

- A. All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem
 - a. Describe how the seasons affect the behavior of plants and animals. **FK - Weather**
 - b. Describe how the seasons affect the everyday life of humans (e.g., clothing, activities) **FK - Weather**

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

- C. The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles
 - a. Observe wind as moving air that is felt **FK – Weather, Wind & Erosion**

2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes

- F. Climate is a description of average weather conditions in a given area due to the transfer of energy and matter through Earth's systems
 - a. Observe and describe daily weather: precipitation (e.g., snow, rain, sleet, fog), wind (i.e., light breezes to strong wind), cloud cover, temperature **FK – Weather, Earth's Changing Environment**
 - b. Observe and describe the general weather conditions that occur during each season **FK – Weather, Earth's Changing Environment**

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It

1. The universe has observable properties and structure

- A. The Earth, Sun, and Moon are part of a larger system that includes other planets and smaller celestial bodies
 - a. Observe and describe the presence of the Sun, Moon, and stars in the sky **FK – Objects in the Sky: Sun and Moon**

b. Observe there are more stars in the sky than anyone can count and that they are scattered unevenly and vary in brightness **FK – Objects in the Sky: Sun and Moon**

2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces

- A. The apparent position of the Sun and other stars, as seen from Earth, change in observable patterns
 - a. Describe the Sun as only being seen in the daytime and appears to move across the sky from morning to night **FK – Objects in the sky: Sun and Moon**
- B. The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns
 - a. Observe the Moon can be seen sometimes at night and sometimes during the daytime **FK – Objects in the Sky: Sun and Moon**
 - b. Observe that the Moon appears to change shape over the course of a month **FK – Objects in the Sky: Sun and Moon**
- C. The regular and predictable motions of the Earth and Moon relative to the Sun explain natural phenomena on Earth, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons
 - a. Observe and describe the characteristics of the four seasons as they cycle through the year (summer, fall, winter, spring) **FK – Objects in the Sky: Sun and Moon, Weather**

Strand 7: Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking

- A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation
 - a. Pose questions about objects, materials, organisms and events in the environment **ALL**
 - b. Conduct a simple investigation (fair test) to answer a question **ALL**
- B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations
 - a. Make qualitative observations using the five senses **ALL**
 - b. Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, magnets, equal arm balances, thermometers) **ALL**
 - c. Measure length and mass using non-standard units **1, 6, Many FK**
 - d. Compare amounts/measurements **5, 8, Many FK**
- C. Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) in light of evidence (data) and scientific principles (understandings)
 - a. Use observations as support for reasonable explanations **ALL**
 - b. Use observations to describe relationships and patterns and to make predictions to be tested **ALL**
 - c. Compare explanations with prior knowledge **ALL**
- D. The nature of science relies upon communication of results and justification of explanations
 - a. Communicate observations using words, pictures, and numbers **ALL**

Strand 8: Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

- A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all
 - a. Observe and identify that some objects occur in nature (natural objects); others have been designed and made by people **ALL**
- B. Advances in technology often result in improved data collection and an increase in scientific information
 - a. Describe how tools have helped scientists make better observations (i.e., magnifiers) **ALL**

3. Science and technology affect, and are affected by, society

- A. People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done
 - a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of individuals solving everyday problems or learning through discovery) **ALL**
 - b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally) **ALL**

First Grade

Strand 1: Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

- A. Objects and the materials they are made of, have properties that can be used to describe and classify them.
 - a. Given an equal-arm balance and various objects, illustrate arrangements in which the beam is balanced **1**
 - b. Measure and compare the mass of objects (more/less) **1, 5**
 - c. Order objects according to mass **5**

2. Energy has a source, can be stored, and can be transferred but is conserved within a system

- A. Forms of energy have a source, a means of transfer (work and heat), and a receiver
 - a. Identify the source of energy that causes an increase in the temperature of an object (e.g., Sun, stove, flame, light bulb) **6, 7, FK – Animals & Energy, Weather, Evaporation & Condensation, Objects in the Sky: Sun and Moon**
 - b. Compare the temperature of hot and cold objects using a simple thermometer **FK - Weather**
 - c. Describe the change in temperature of an object as warmer or cooler **FK - Weather**
- C. Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth
 - a. Identify light from the Sun as a basic need of most plants **3, 4**

Strand 2: Properties and Principles of Force and Motion

1. The motion of an object is described by its change in position relative to another object or point

A. The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference) **2**

2. Forces affect motion

A. Forces are classified as either contact (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude

a. Identify the force (i.e., push or pull) required to do work (move an object) **2**

D. Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion

a. Describe ways to change the motion of an object (i.e., how to cause an object to go slower, go faster, go farther, change direction, stop) **2**

Strand 3: Characteristics and Interactions of Living Organisms

1. There is a fundamental unity underlying the diversity of all living organisms

A. Organisms have basic needs for survival

a. Identify the basic needs of most animals (i.e., air, water, food, shelter) **3, 4**

b. Identify the basic needs of most plants (i.e., air, water, light) **3, 4**

c. Predict and investigate the growth of plants when growing conditions are altered (e.g., dark vs. light, water vs. no water) **3, 4**

D. Plants and animals have different structures that serve similar functions necessary for the survival of the organism

a. Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, flowers, seeds, roots) **3, 4**

b. Identify and compare the physical structures of a variety of animals (e.g., sensory organs, beaks, appendages, body covering) (Do NOT assess terms: sensory organs, appendages) **3, 4, FK – Animal Adaptations**

c. Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, absorption of light energy, support, reproduction) **4**

d. Identify the relationships between the physical structures of animals and the function of those structures (e.g., taking in water, support, movement, obtaining food, reproduction) **3, 4, FK – Animal Adaptations**

E. Biological classifications are based on how organisms are related

a. Distinguish between plants and animals based on observable structures and behaviors **4**

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes

- F. Climate is a description of average weather conditions in a given area due to the transfer of energy and matter through Earth's systems
- a. Observe, measure, record weather data throughout the year (i.e., cloud cover, temperature, precipitation, wind speed) by using thermometers, rain gauges, wind socks **FK – Weather, Earth's Changing Environment**
 - b. Compare temperatures in different locations (e.g., inside, outside, in the sun, in the shade) **FK – Weather, Earth's Changing Environment**
 - c. Compare weather data observed at different times throughout the year (e.g., hot vs. cold, cloudy vs. clear, types of precipitation, windy vs. calm) **FK – Weather, Earth's Changing Environment**
 - d. Identify patterns indicating relationships between observed weather data and weather phenomena (e.g., temperature and types of precipitation, clouds and amounts of precipitation) **FK – Weather, Earth's Changing Environment**

3. Human activity is dependent upon and affects Earth's resources and systems

- A. Earth's materials are limited natural resource's affected by human activity
- a. Observe and describe ways water, both as a solid and liquid, is used in every day activities at different times of the year (e.g., bathe, drink, make ice cubes, build snowmen, cook, swim) **5, FK- Earth's Water Cycle**

Strand 7: Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking

- A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation
- a. Pose questions about objects, materials, organisms, and events in the environment **ALL**
 - b. Plan and conduct a simple investigation (fair test) to answer a question **ALL**
- B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations
- a. Make qualitative observations using the five senses **ALL**
 - b. Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, magnets, equal arm balances, thermometers) **ALL**
 - c. Measure length, mass, and temperature using standard and non-standard units **1, 6, FK - Weather, Many FK**
 - d. Compare amounts/measurements **5, 8, Many FK**
- C. Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) in light of evidence (data) and scientific principles (understandings)
- a. Use observations as support for reasonable explanations **ALL**

- b. Use observations to describe relationships and patterns and to make predictions to be tested **ALL**
- c. Compare explanations with prior knowledge **ALL**
- D. The nature of science relies upon communication of results and justification of explanations
 - a. Communicate simple procedures and results of investigations and explanations through: **ALL**
 - oral presentations
 - drawings and maps
 - data tables
 - graphs (bar, pictograph)
 - writings

Strand 8: Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

- A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all
 - a. Observe and identify that some objects occur in nature (natural objects); others have been designed and made by people **ALL**
- B. Advances in technology often result in improved data collection and an increase in scientific information
 - a. Describe how tools have helped scientists make better observations (e.g., magnifiers, balances, thermometers) **ALL**

3. Science and technology affect, and are affected by, society

- A. People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done
 - a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of individuals solving everyday problems or learning through discovery) **ALL**
 - b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally) **ALL**

Second Grade

Strand 1: Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

- A. Objects and the materials they are made of, have properties that can be used to describe and classify them.
 - a. Describe and compare the physical properties of objects by using simple tools (i.e., thermometer, magnifier, centimeter ruler, balance, magnet) **ALL**
 - b. Classify objects/substances as “one kind of material” or a mixture (e.g. m & m’s® vs. trail mix, water vs. kool aid®) **8**

- B. Properties of mixtures depend upon the concentrations, properties, and interactions of particles
 - a. Observe and describe how mixtures are made by combining solids **8**
 - b. Describe ways to separate the components of a mixture by their physical properties (e.g., sorting, magnets, screening) **8**

2. Energy has a source, can be stored, and can be transferred but is conserved within a system

- A. Forms of energy have a source, a means of transfer (work and heat), and a receiver
 - a. Identify air, water, and solids as mediums that sound travels through **FK - Sound**
 - b. Describe different ways to change the pitch of a sound (i.e., changes in size, such as length or thickness, and in tightness/tension of the source) **FK - Sound**
 - d. Describe how to change the loudness of a sound (i.e., increase or decrease the force causing vibrations) **FK - Sound**

Strand 2: Properties and Principles of Force and Motion

1. The motion of an object is described by its change in position relative to another object or point

- B. An object that is accelerating is speeding up, slowing down, or changing direction
 - a. Describe Earth's gravity as a force that pulls objects on or near the Earth toward the Earth without touching the object **2, FK – Invisible Forces**

2. Forces affect motion

- A. Forces are classified as either contact (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude
 - a. Identify magnets attract and repel each other and certain materials **FK – Invisible Forces**
 - b. Describe magnetism as a force that can push or pull other objects without touching them **FK – Invisible Forces**
 - c. Measure (using non-standard units) and compare the force (i.e., push or pull) required to overcome friction and move an object over different surfaces (i.e., rough, smooth) **2**
- D. Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion
 - a. Describe the direction and amount of force (i.e., direction of push or pull, strong/weak push or pull) needed to change an object's motion (i.e., faster/slower, change in direction) **2**
 - b. Describe and compare the distances traveled by heavier/lighter objects after applying the same amount of force (i.e., push or pull) in the same direction **2**
 - c. Describe and compare the distances traveled by objects with the same mass after applying different amounts of force (i.e., push or pull) in the same direction **2**
- F. Work transfers energy into and out of a mechanical system
 - a. Compare and describe the amount of force (i.e., more, less, or same push or pull) needed to raise an object to a given height, with or without using inclined planes (ramps) of different slopes **1, 2**
 - b. Compare and describe the amount of force (i.e., more, less, or same push or pull) needed to raise an object to a given height, with or without using levers **1, 2**

- c. Apply the use of an inclined plane (ramp) and/or lever to different real life situations in which objects are raised **1, 2**

Strand 3: Characteristics and Interactions of Living Organisms

1. There is a fundamental unity underlying the diversity of all living organisms

B. Organisms progress through life cycles unique to different types of organisms

- a. Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e, butterfly, frog, chicken, snake, dog) **4**
- b. Record observations on the life cycle of different animals (e.g., butterfly, dog, frog, chicken, snake) **4**

3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through productive processes

D. There is heritable variation within every species of organism

- a. Identify and relate the similarities and differences among animal parents and their offspring or multiple offspring **4, FK Animal Adaptations**

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

A. The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties

- a. Observe and describe the physical properties (e.g., odor, color, appearance, relative grain size, texture, absorption of water) and different components (i.e., sand, clay, humus) of soils **FK – Rocks and Soil**
- b. Observe and describe the physical properties of rocks (e.g., size, shape, color, presence of fossils) **FK – Rocks and Soil**

2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes

A. The Earth's materials and surface features are changed through a variety of external processes

- a. Observe and identify examples of slow changes in the Earth's surface and surface materials (e.g., rock, soil layers) due to processes such as decay (rotting), freezing, thawing, breaking, or wearing away by running water or wind **FK – Wind & Erosion**

3. Human activity is dependent upon and affects Earth's resources and systems

A. Earth's materials are limited natural resource's affected by human activity

- a. Observe and describe ways humans use Earth's materials (e.g., soil, rocks) in a daily life **FK – Rocks & Soil, Earth's Changing Environment**

Strand 7: Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking

- A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation
 - a. Pose questions about objects, materials, organisms and events in the environment **ALL**
 - b. Plan and conduct a simple investigation (fair test) to answer a question **ALL**
- B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations
 - a. Make qualitative observations using the five senses **ALL**
 - b. Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, magnets, equal arm balances, thermometers) **ALL**
 - c. Measure length, mass, and temperature using standard and non-standard units **1, 6, Many FK**
 - d. Compare amounts/measurements **5, 8, Many FK**
- C. Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) in light of evidence (data) and scientific principles (understandings)
 - a. Use observations as support for reasonable explanations **ALL**
 - b. Use observations to describe relationships and patterns and to make predictions to be tested **ALL**
 - c. Compare explanations with prior knowledge **ALL**
- D. The nature of science relies upon communication of results and justification of explanations
 - a. Communicate simple procedures and results of investigations and explanations through: **ALL**
 - oral presentations
 - drawings and maps
 - data tables
 - graphs (bar, pictograph)
 - writings

Strand 8: Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

- B. Advances in technology often result in improved data collection and an increase in scientific information
 - a. Describe how tools have helped scientists make better observations, measurements, or equipment for investigations (e.g., magnifiers, balances, stethoscopes, thermometers) **ALL**

3. Science and technology affect, and are affected by, society

- A. People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done

- a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of individuals solving everyday problems or learning through discovery) **ALL**
- b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally) **ALL**

Third Grade

Strand 1: Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

D. Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter.

- a. Compare the observable physical properties of solids, liquids, or gases (air) (i.e., visible vs. invisible, changes in shape, changes in the amount of space occupied) **7, FK – Earth’s Water Cycle**
- b. Identify everyday objects/substances as solid, liquid, or gas (e.g., air, water) **7**
- c. Observe and identify that water evaporates (liquid water changes into a gas as it moves into the air) **7, FK – Earth’s Water Cycle, Evaporation & Condensation**
- d. Measure and compare the temperature of water when it exists as a solid to its temperature when it exists as a liquid **7, FK Weather**
- e. Investigate and observe that water can change from a liquid to a solid (freeze), and back again to a liquid (melt), as the result of temperature changes **7**
- f. Describe the changes in the physical properties of water (i.e., shape, volume) when frozen or melted **7**
- g. Predict and investigate the effect of heat (thermal energy) (i.e., change in temperature, melting, evaporation) on objects and materials **3, 7, FK - Weather**

2. Energy has a source, can be stored, and can be transferred but is conserved within a system

- A. Forms of energy have a source, a means of transfer (work and heat), and a receiver
 - a. Identify sources of thermal energy (e.g., Sun, stove, fire, body) that can cause solids to change to liquids, and liquids to change to gas **7, FK – Earth’s Water Cycle, Evaporation and Condensation**
 - b. Identify sources of light energy (e.g., Sun, bulbs, flames) **6, 7, FK - Objects in the Sky: Sun and Moon**
 - c. Observe light being transferred from the source to the receiver (eye) through space **6**
 - d. Identify the three things (light source, object, and surface) necessary to produce a shadow **6**
- C. Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth
 - a. Identify the Sun as the primary source of light and food energy on Earth **4, FK - Objects in the Sky: Sun and Moon**

Strand 3: Characteristics and Interactions of Living Organisms

1. There is a fundamental unity underlying the diversity of all living organisms

- A. Organisms have basic needs for survival
 - a. Describe the basic needs of most plants (i.e., air, water, light, nutrients, temperature) **4**
- B. Organisms progress through life cycles unique to different types of organisms
 - a. Describe and sequence the stages in the life cycle (for a plant) of seed germination, growth and development, reproduction, and death (i.e., a flowering plant) **4**
- D. Plants and animals have different structures that serve similar functions necessary for the survival of the organism
 - a. Identify the major organs (roots, stems, flowers, leaves) and their functions in vascular plants (e.g., absorption, transport, reproduction) (Do NOT assess the term vascular) **4**

2. Living organisms carry out life processes in order to survive

- C. Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means
 - a. Illustrate and trace the path of water and nutrients as they move through the transport system of a plant **4**

3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through productive processes

- D. There is heritable variation within every species of organism
 - a. Identify and relate the similarities and differences between plants and their offspring (i.e., seedlings) **4**

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments

2. Matter and energy flow through an ecosystem

- A. As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use
 - a. Identify sunlight as the primary source of energy, plants use to produce their own food **4**
 - b. Classify populations of organisms as producers or consumers by the role they serve in the ecosystem **FK – Garden Habitats**
 - c. Sequence the flow of energy through a food chain beginning with the Sun **3, 4**
 - d. Predict the possible effects of removing an organism from a food chain **3, FK – Garden Habitats**

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

- C. The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles
 - a. Identify that liquid water can be changed into a gas (vapor) in the air. **7, 8, FK- Earth's Water Cycle, Evaporation & Condensation, Weather**
 - b. Identify that clouds are composed of tiny droplets of water **FK- Earth's Water Cycle, Evaporation & Condensation, Weather**
 - c. Identify air as a substance that surrounds us, taking up space and moves around us as wind **FK - Weather**

2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes

- E. Changes in the form of water as it moves through Earth's systems are described as the water cycle
 - a. Describe clouds and precipitation as forms of water **FK- Earth's Water Cycle, Evaporation & Condensation, Weather**

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It

1. The universe has observable properties and structure

- A. The Earth, Sun, and Moon are part of a larger system that includes other planets and smaller celestial bodies
 - a. Describe our Sun as a star because it provides light energy to the solar system **FK - Objects in the Sky: Sun and Moon**
 - b. Observe and identify the Moon as a reflection of light **FK - Objects in the Sky: Sun and Moon**

2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces

- A. The apparent position of the Sun and other stars, as seen from Earth, change in observable patterns
 - a. Illustrate and describe how the Sun appears to move slowly across the sky from east to west during the day **6, FK - Objects in the Sky: Sun and Moon**
- B. The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns
 - a. Illustrate and describe how the Moon appears to move slowly across the sky from east to west during the day and/or night **FK – Objects in the Sky: Sun and Moon**
 - b. Describe the pattern of change that can be observed in the Moon's appearance relative to time of day and month as it occurs over several months **FK - Objects in the Sky: Sun and Moon**

- C. The regular and predictable motions of the Earth and Moon relative to the Sun explain natural phenomena on Earth, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons
- Observe and identify there is a day/night cycle every 24 hours **FK - Objects in the Sky: Sun and Moon, Other FK**
 - Describe the changes in length and position (direction) of shadows from morning to midday to afternoon **6**
 - Describe how the Sun's position in the sky changes the length and position of shadows **6**

Strand 7: Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking

- A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation
- Pose questions about objects, materials, organisms, and events in the environment **ALL**
 - Plan and conduct a fair test to answer a question **ALL**
- B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations
- Make qualitative observations using the five senses **ALL**
 - Make observations using simple tools and equipment (e.g., hand lenses, magnets, thermometers, metric rulers, balances, graduated cylinders) **ALL**
 - Measure length to the nearest centimeter, mass using grams, temperature using degrees Celsius, volume using liters **1, 5, 8, FK – Weather, Many FK**
 - Compare amounts/measurements **1, 5, 8, Many FK**
 - Judge whether measurements and computation of quantities are reasonable **ALL**
- C. Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) in light of evidence (data) and scientific principles (understandings)
- Use quantitative and qualitative data as support for reasonable explanations **ALL**
 - Use data as support for observed patterns and relationships, and to make predictions to be tested **ALL**
 - Evaluate the reasonableness of an explanation **ALL**
 - Analyze whether evidence supports proposed explanations **ALL**
- D. The nature of science relies upon communication of results and justification of explanations
- Communicate simple procedures and results of investigations and explanations through: **ALL**
 - oral presentations
 - drawings and maps
 - data tables
 - graphs (bar, single line, pictograph)
 - writings

Strand 8: Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

- A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all
 - a. Observe and identify that some objects or materials (e.g., Sun, fire, ice, snow) occur in nature (natural objects); others (e.g., stoves, refrigerators, bulbs, candles, lanterns) have been designed and made by people to solve human problems and enhance the quality of life (human-made objects) **ALL**
- B. Advances in technology often result in improved data collection and an increase in scientific information
 - a. Describe how new technologies have helped scientists make better observations and measurements for investigations (e.g., telescopes, magnifiers, balances, microscopes, computers, stethoscopes, thermometers) **ALL**

3. Science and technology affect, and are affected by, society

- A. People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done
 - a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of people working alone or in groups solving everyday problems or learning through discovery) **ALL**
 - b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally) **ALL**