



# Our Savior Christian Academy

## *Curriculum Framework for:*     **Science**

*Our Savior Christian Academy's "Curriculum Framework for Science" is designed as a tool that will follow the same format for all grades K-4. Each grade level will have a separate section based on classroom structure, and it will be up to each individual teacher to design a lesson plan that fits their classroom needs based on these standards and suggestions.*

*Our Savior Christian Academy's "Curriculum Framework for Science" is offered to the glory of God that it may be a blessing among Lutheran school educators and their students.*

## ✠ **PHILOSOPHY** ✠

*God is the Creator of all things living and non-living. He lovingly upholds all created things. God's glory and His character are revealed through exploration, observation, and scientific study of His world. Man's fall into sin has impacted all of creation, and it literally groans in expectation waiting for Christ's second return, when all things will be made new. We seek to serve God as wise stewards of His resources and work to restore Creation's original beauty.*

# Our Savior Christian Academy

## *Broad Goals*

### *Our Savior Christian Academy's Science goals include:*

- Incorporating Jesus Christ in all core areas of Science.
- Providing the children with a wide range of knowledge, skills, and related activities that help him/her to develop an understanding of the physical world.
- Encouraging the children to be confident and to communicate Science effectively through reading, writing, speaking, and listening.
- Using higher order thinking skills including comprehension, application, analysis, evaluation, and synthesis in the learning concepts in life science, earth science, and physical science.
- Displaying respect in their interactions with the environments of which they are members.
- Exhibiting organizational skills, intellectual curiosity and growth, and application of what has been learned in science both to future schoolwork and to lifelong learning.
- Providing learning experiences in which students will recognize, develop, and apply effective communication skills at or above grade level in the areas of Science.
- Students are shown strategies on how to be knowledgeable and proficient thinkers who will make positive Christ-like contributions to society.

### *Our Savior Christian Academy obtains this through:*

- Keeping Our Savior, Jesus Christ, as the center focus on our campus and in our curriculum
- Fascinating and significant Science experiences through multi-sensory activities that incorporate the world around them.
- Applying Science to other core areas of learning.
- Adapting other subjects to add valuable perspectives to the Science curriculum.
- Teaching on an individual basis with the knowledge that children acquire an understanding of Science in an uneven way.
- Continuous assessment for analysis and planning in Science.
  - Focuses on the identification of the children's existing knowledge and strategies.
  - Updating curriculum to meet changing state standards along with student needs.
  - Provides information that will enable the teacher to cater for individual differences in ability, previous learning and learning style, and to resist pressure to push the child to premature mastery.
- Work samples and results that are shared with the parents, congregants, and community.

# Strand 1: Properties and Principles of Matter and Energy

**Strand 1-Integrating Faith by teaching the scientific principles to explore, discover, and classify God’s creation.**

1. Changes in properties and states of matter provide evidence of the atomic theory of matter	
<b>Sixth</b>	
<b>A</b>	<i>Scope and Sequence – Properties of and Changes in Matter</i>
<b>Objects, and the materials they are made of, have properties that can be used to describe and classify them</b>	<p>a. Identify matter is anything that has mass and volume</p> <p>b. Describe and compare the volumes (the amount of space an object occupies) of objects or substances directly, using a graduated cylinder, and/or indirectly, using displacement methods</p> <p>c. Describe and compare the masses (amounts of matter) of objects to the nearest gram using a balance</p> <p>d. Classify the types of matter in an object into pure substances or mixtures using their specific physical properties</p> <p><b>Curriculum</b>            Weight &amp; Mass  <a href="http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=653">http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=653</a>            Determining Density via Water Displacement  <a href="http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=400">http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=400</a>            Measuring Volume  <a href="http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=1048">http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=1048</a>            Triple Beam Balance  <a href="http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=385">http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=385</a></p>
<b>DOK</b>	<b>a – 1, b – 2, c – 2, d – 2</b>
<b>B</b>	<i>Scope and Sequence – Properties of and Changes in Matter</i>
<b>Properties of mixtures depend upon the concentrations, properties, and interactions of particles</b>	<p>a. Describe the properties of each component in a mixture/solution and their distinguishing properties (e.g., salt water, oil and vinegar, pond water, Kool-Aid)</p> <p>b. Describe appropriate ways to separate the components of different types of mixtures (sorting, evaporation, filtration, magnets, boiling, chromatography, screening)</p> <p>c. Predict how various solids (soluble/insoluble) behave (e.g., dissolve, settle, float) when mixed with water</p> <p><b>Curriculum</b>            Separating Mixtures  <a href="http://www.mikecurtis.org.uk/mixtures.htm">http://www.mikecurtis.org.uk/mixtures.htm</a></p>
<b>DOK</b>	<b>a – 2, b – 2, c – 3</b>
<b>C</b>	<i>Scope and Sequence – Properties of and Changes in Matter</i>
<b>Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification</b>	<p>a. Describe evidence (e.g., diffusion of food coloring in water, light reflecting off of dust particles in the air, condensation of water vapor by increased pressure or decreased temperature) that supports the theory that matter is composed of small particles (atoms, molecules) that are in constant, random motion</p> <p><b>Curriculum</b>            Colligative Properties  <a href="http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=511">http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=511</a></p>
<b>DOK</b>	<b>a – 1</b>

## 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 -- Continued		
	Sixth	Seventh
<b>D</b>	<i>Scope and Sequence – Earth’s Resources</i>	<i>Scope and Sequence – Weather and Climate</i>
<b>Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter</b>	a. Describe the relationship between the change in the volume of water and changes in temperature as it relates to the properties of water (i.e., water expands and becomes less dense when frozen)  <b>Curriculum</b> Phases of Water <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=661">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=661</a>	a. Describe the relationship between temperature and the movement of atmospheric gases (i.e., warm air rises due to expansion of the volume of gas, cool air sinks due to contraction of the volume of gas)  <b>Curriculum</b> Hot Air Balloon Inflating <a href="http://www.sciencekidsathome.com/science_experiments/hot_air_balloon_inflating.html">http://www.sciencekidsathome.com/science_experiments/hot_air_balloon_inflating.html</a>
DOK	a – 2	a – 2

1. Changes in properties and states of matter provide evidence of the atomic theory of matter -- Continued		
	Sixth	
<b>G</b>	<i>Scope and Sequence – Properties of and Changes in Matter</i>	
<b>Properties of objects and states of matter can change chemically and/or physically</b>	a. Identify and classify changes in matter as chemical and/or physical b. Identify chemical changes (i.e., rusting, oxidation, burning, decomposition by acids, decaying, baking) in common objects (i.e., rocks such as limestone, minerals, wood, steel wool, plants) as a result of interactions with sources of energy or other matter that form new substances with different characteristic properties c. Identify physical changes in common objects (e.g., rocks, minerals, wood, water, steel wool, plants) and describe the processes which caused the change (e.g., weathering, erosion, cutting, dissolving)  <b>Curriculum</b> <b>Chemical Equations</b> <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=461">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=461</a>	
DOK	a – 2, b – 2, c – 2	
	Seventh	
<b>I</b>	<i>Scope and Sequence – Properties of and Changes in Matter</i>	<i>Scope and Sequence – Weather and Climate</i>
<b>Mass is conserved during any physical or chemical change</b>	a. Demonstrate and provide evidence that mass is conserved during a physical change  <b>Curriculum</b> <b>Density Experiment: Slice and Dice</b> <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=434">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=434</a>	<b>Curriculum</b> a. Explain that the amount of matter remains constant while being recycled through the water cycle. Students observe a model of the water cycle, discuss characteristics of cycles and review conservation of matter in chemical reactions and in digesting food. Students then read a story tracing the path of carbon and oxygen atoms as they change form and move in a cycle. Finally, students compare and contrast the cycle of matter with the flow of energy. b.
DOK	a – 2	a – 1

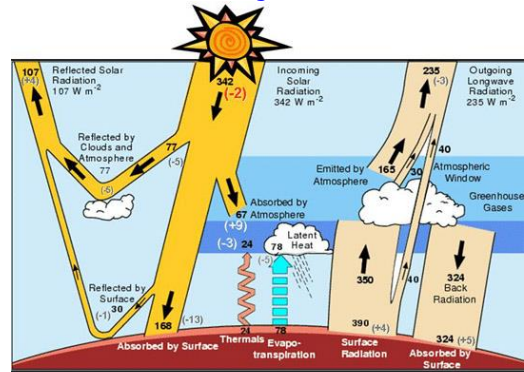
## Strand 1: Properties and Principles of Matter and Energy

2. Energy has a source, can be stored, and can be transferred but is conserved within a system		
	Sixth	Seventh
<b>A</b>	<p><i>Scope and Sequence -- Forms of Energy: Light</i></p> <ol style="list-style-type: none"> <li>Identify sources of visible light (e.g., the Sun and other stars, flint, bulb, flames, lightning)</li> <li>Describe evidence (i.e., cannot bend around walls) that visible light travels in a straight line, using the appropriate tools (i.e., pinhole viewer, ray box, laser pointer)</li> <li>Compare the reflection of visible light by various surfaces (i.e., mirror, smooth and rough surfaces, shiny and dull surfaces, Moon)</li> <li>Compare the refraction of visible light passing through different transparent and translucent materials (e.g., prisms, water, a lens)</li> <li>Predict how different surfaces (transparent, translucent, opaque) and lenses (convex, concave) affect the behavior of visible light rays and the resulting image of an object</li> <li>Identify receivers of visible light energy (e.g., eye, photocell)</li> <li>Recognize and explain that an object is "seen" only when the object emits or reflects light to the eye</li> <li>Recognize differences in wavelength and energy levels within that range of visible light that can be seen by the human eye are perceived as differences in color</li> </ol> <p><b>Curriculum Herschel Experiment</b>  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=389">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=389</a></p> <p><b>Radiation</b>  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=665">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=665</a></p> <p><b>Laser Reflection</b>  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=414">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=414</a></p> <p><b>Basic Prism</b>  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=608">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=608</a></p> <p><b>Heat Observation</b>  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=655">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=655</a></p> <p><i>Scope and Sequence – Forms of Energy: Sound</i></p> <ol style="list-style-type: none"> <li>Describe how sound energy is transferred by wave-like disturbances that spread away from the source through a medium</li> <li>Describe how changes in energy cause changes in loudness and pitch of a sound</li> <li>Predict how the properties of the medium (e.g., air, water, empty space, rock) affect the speed of different types of mechanical waves (i.e., earthquake, sound)</li> </ol> <p><b>Curriculum</b></p> <p><b>Longitudinal Waves</b>  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=610">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=610</a></p> <p><b>Ripple Tank</b>  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=1043">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=1043</a></p>	<p><i>Scope and Sequence – Forms of Energy: Heat</i></p> <ol style="list-style-type: none"> <li>Identify thermal energy as the random motion (kinetic energy) of molecules or atoms within a substance</li> <li>Use the kinetic molecular model to explain changes in the temperature of a material</li> <li>Identify thermal energy is transferred as heat from warmer objects to cooler objects until both reach the same temperature (equilibrium)</li> <li>Identify the type of materials that transfer energy by conduction, convection, and/or radiation</li> <li>Describe how heat is transferred by conduction, convection, and radiation, and classify examples of each</li> <li>Classify common materials (e.g., wood, foam, plastic, glass, aluminum foil, soil, air, water) as conductors or insulators of thermal energy</li> <li>Predict the differences in temperature over time on different colored (black and white) objects placed under the same heat source</li> </ol> <p><b>Curriculum</b> Explore these sites to learn about heat transfer and thermal insulators. Find out how molecules movement in all types of matter generates heat. Learn about conduction, convection, and radiation. There is a link to an eThemes resource on heat as a type of energy. Includes animated images, quizzes, a lesson plan, and experiments.  <a href="http://ethemes.missouri.edu/themes/1369">http://ethemes.missouri.edu/themes/1369</a></p> <p><i>Scope and Sequence – Forms of Energy: Electricity and Magnetism</i></p> <ol style="list-style-type: none"> <li>Describe the interactions (i.e., repel, attract) of like and unlike charges (i.e., magnetic, static electric, electrical)</li> <li>Diagram and identify a complete electric circuit by using a source (battery), means of transfer (wires), and receiver (resistance bulbs, motors, fans)</li> <li>Observe and describe the evidence of energy transfer in a closed series circuit</li> <li>Describe the effects of resistance (number of receivers), amount of voltage (number of energy sources), and kind of transfer materials on the current being transferred through a circuit (e.g., brightness of light, speed of motor)</li> <li>Classify materials as conductors or insulators of electricity when placed within a circuit (e.g., wood, pencil lead, plastic, glass, aluminum foil, lemon juice, air, water)</li> <li>Diagram and distinguish between complete series and parallel circuits</li> <li>Identify advantages and disadvantages of series and parallel circuits</li> </ol> <p><b>Curriculum Science Projects</b>  <a href="http://www.scienceprojects.in/electricity-and-magnetism.htm/">http://www.scienceprojects.in/electricity-and-magnetism.htm/</a></p>
<b>DOK</b>	a – 1, b – 2, c – 2, d – 2, e – 3, f – 1, g – 1, h – 2, i – 1, j – 3	a – 1, b – 2, c – 1, d – 1, e – 2, f – 1, g – 2, h – 1, i – 2, j – 2, k – 2, l – 1, m – 2, n – 1

## Strand 1: Properties and Principles of Matter and Energy

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

<b>C</b>	<p><i>Scope and Sequence – Forms of Energy – Light</i></p> <p>a. Recognize and describe how energy from the Sun is transferred to Earth in a range of wavelengths and energy levels, including visible light, infrared radiation, and ultraviolet radiation</p> <p style="text-align: center;"><i>Scope and Sequence- Characteristics of Living Organisms</i></p> <p>b. Recognize and apply the fact that energy from the Sun is the source of almost all energy used to produce the food for living organisms</p> <p><b>Curriculum</b>  <b>Herschel Experiment</b>  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=389">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=389</a>  <b>Radiation</b>  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=665">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=665</a>  <b>Heat Observation</b>  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=655">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=655</a>  <b>Forest Ecosystem</b>  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=639">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=639</a></p>	<p><i>Scope and Sequence – Weather and Climate</i></p> <p>a. Identify solar radiation as the primary source of energy for weather phenomena</p> <p><b>Curriculum</b>          Study solar radiation as being the primary source.  <a href="http://www.Solarinsolation.org">www.Solarinsolation.org</a></p>
DOK	a – 2, b – 1	a – 1



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

<b>Seventh</b>	
<b>F</b>	<p><i>Scope and Sequence – Energy Transformations</i></p> <p>a. Identify the different energy transformations that occur between different systems (e.g., chemical energy in battery converted to electricity in circuit converted to light and heat from a bulb)</p> <p>b. Identify that, during an energy transformation, heat is often transferred from one object (system) to another because of a difference in temperature</p> <p>c. Recognize and describe how energy is not lost but conserved as it is transferred and transformed</p> <p><b>Curriculum</b>  <b>Energy Transformation</b>  <a href="http://astlc.ua.edu/lessonplans/LCEnTran.htm">http://astlc.ua.edu/lessonplans/LCEnTran.htm</a></p>
DOK	a – 1, b – 1, c – 1

# Strand 2: Properties and Principles of Force and Motion

**Strand 2-** Integrating Faith by being able to use scientific principles to explore, discover, and classify God's creation.

1. The motion of an object is described by its change in position relative to another object or point	
<b>A</b>	<b>Seventh</b>
<b>The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)</b>	<p><i>Scope and Sequence – Force, Motion, and Work</i></p> <p>a. Describe the circular motion of a moving object as the result of a force acting toward the center</p> <p>b. Classify different types of motion (e.g., straight line, projectile, circular, vibrational)</p> <p>c. Given an object in motion, calculate its speed (distance/time)</p> <p>d. Interpret a line graph representing an object's motion in terms of distance over time (speed) using metric units</p> <p><b>Curriculum</b></p> <p>Distance-Time Graphs  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=260">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=260</a></p> <p>Free Fall Tower  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=650">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=650</a></p> <p>Free-Fall Laboratory  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=387">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=387</a></p> <p>Golf Range  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=26">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=26</a></p> <p>Period of a Pendulum  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=391">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=391</a></p> <p>Shoot the Monkey  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=609">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=609</a></p> <p>Distance-Time and Velocity-Time Graphs  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=301">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=301</a></p>
<b>DOK</b>	<b>a – 1, b – 1, c – 1, d – 2</b>

2. Forces affect motion	
<b>A</b>	<b>Seventh</b>
<b>Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude</b>	<p><i>Scope and Sequence – Force, Motion, and Work</i></p> <p>a. Identify and describe the types of forces acting on an object in motion, at rest, floating/sinking (i.e., type of force, direction, amount of force in Newton's)</p> <p>b. Compare the forces acting on an object by using a spring scale to measure them to the nearest Newton</p> <p><b>Curriculum</b></p> <p>Force &amp; Fan Carts <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=614">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=614</a></p>
<b>DOK</b>	<b>a – 1, b – 2</b>
<b>B</b>	<b>Seventh</b>
<b>Every object exerts a gravitational force on every other object</b>	<p><i>Scope and Sequence – Force, Motion, and Work</i></p> <p>a. Explain every object exerts a gravitational force of attraction on every other object</p> <p>b. Recognize an object's weight is a measure of the gravitational force of a planet/moon acting on that object</p> <p>c. Compare the amount of gravitational force acting between objects (which is dependent upon their masses and the distance between them)</p> <p><b>Curriculum</b> Force &amp; Fan Carts <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=614">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=614</a></p> <p>Free Fall Laboratory  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=387">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=387</a></p>
<b>DOK</b>	<b>a – 1, b – 1, c – 2</b>

## Strand 2: Properties and Principles of Force and Motion

<b>D</b>	Scope and Sequence – Force, Motion, and Work
<b>Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion</b>	a. Compare the effects of balanced and unbalanced forces (including magnetic, gravity, friction, push or pull) on an object's motion b. Explain that when forces (including magnetic, gravity, friction, push or pull) are balanced, objects are at rest or their motion remains constant c. Explain that a change in motion is the result of an unbalanced force acting upon an object d. Explain how the acceleration of a moving object is affected by the amount of net force applied and the mass of the object <b>Curriculum</b> Force & Fan Carts <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=614">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=614</a> Free Fall Laboratory <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=387">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=387</a>
<b>DOK</b>	<b>a – 2, b – 1, c – 1, d – 1</b>



## Strand 2: Properties and Principles of Force and Motion

2. Forces affect motion – Continued	
Seventh	
DOK	
<b>F</b>	<i>Scope and Sequence – Force, Motion, and Work</i>
<b>Work transfers energy into and out of a mechanical system</b>	<p>a. Recognize examples of work being done on an object (force applied and distance moved in the direction of the applied force) with and without the use of simple machines</p> <p>b. Calculate the amount of work done when a force is applied to an object over a distance (<math>W = F \times d</math>)</p> <p>c. Explain how simple machines affect the amount of effort force, distance through which a force is applied, and/or direction of force while doing work</p> <p>d. Recognize the amount of work output is never greater than the amount of work input, with or without the use of a simple machine</p> <p>e. Evaluate simple machine designs to determine which design requires the least amount of effort force and explain why</p> <p><b>Curriculum</b> Ants on a Slant (Inclined Plane) <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=649">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=649</a></p> <p>Levers <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=646">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=646</a></p> <p>Wheel and Axle <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=654">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=654</a></p>
DOK	<b>a – 1, b – 1, c – 2, d – 1, e – 2</b>

## Strand 3: Characteristics and Interactions of Living Organisms

**Strand 3-Integrating Faith** by teaching that God created the heavens and the earth, including all things visible and invisible, amazingly large and atomically small, living and non-living.

1. There is a fundamental unity underlying the diversity of all living organisms	
	<b>Sixth</b>
<b>A</b> Organisms have basic needs for survival	<p><i>Scope and Sequence – Characteristics of Living Organisms</i></p> <p>a. Describe the common life processes necessary to the survival of organisms (i.e., growth, reproduction, life span, response to stimuli, energy use, exchange of gases, use of water, elimination of waste)</p> <p><b>Curriculum</b>  <a href="#">Growth----Feeling to Tall or Too Short</a>  <a href="#">Reproduction----They'll Make More</a>  <a href="#">Life Span-----Life Expectancy</a>  <a href="#">Response to Stimuli-----Signs of Life</a>  <a href="#">Energy Use -----Mysterious Everything</a>  <a href="#">Exchange of Gases-----Anatomy of Breathing</a>  <a href="#">Use of Water--Water for Life</a>  <a href="#">Elimination of Waste-----Detoxification</a></p>
DOK	a – 2
<b>C</b> Cells are the fundamental units of structure and function of all living things	<p><i>Scope and Sequence – Characteristics of Living Organisms</i></p> <p>a. Recognize all organisms are composed of cells, the fundamental units of life, which carry on all life processes</p> <p><b>Curriculum</b>                      Research cells and their purpose</p>
DOK	a – 1
<b>E</b> Biological classifications are based on how organisms are related	<p><i>Scope and Sequence – Characteristics of Living Organisms</i></p> <p>a. Recognize most of the organisms on Earth are unicellular (e.g., bacteria, protists) and other organisms, including humans, are multicellular</p> <p>b. Identify examples of unicellular (e.g., bacteria, some protists, fungi) and multicellular organisms (e.g., some fungi, plants, animals)</p> <p><b>Curriculum</b>                      Digestive System  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=1050">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=1050</a>                      Paramecium Homeostasis  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=520">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=520</a></p>
DOK	a – 2, b – 2

2. Living organisms carry out life processes in order to survive	
	<b>Sixth</b>
<b>A</b> The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means	<p><i>Scope and Sequence – Characteristics of Living Organisms</i></p> <p>a. Compare and contrast the following plant and animal cell structures: cell membrane, nucleus, cell wall, chloroplast, and cytoplasm</p> <p>b. Recognize the chloroplast as the cell structure where food is produced in plants and some unicellular organisms (e.g., algae, some protists)</p> <p><b>Curriculum</b>                      Cell Structure  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=450">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=450</a></p>
DOK	a – 2, b – 1

# Strand 3: Characteristics and Interactions of Living Organisms

<p><b>B</b></p> <p><b>Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth</b></p>	<p><i>Scope and Sequence – Characteristics of Living Organisms</i></p> <p>a. Describe how plants use energy from the Sun to produce food and oxygen through the process of photosynthesis</p> <p><b>Curriculum</b></p> <p>Food Chain <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=381">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=381</a></p> <p>Forest Ecosystem <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=639">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=639</a></p> <p>Photosynthesis Lab <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=395">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=395</a></p>
<p><b>DOK</b></p>	<p><b>a – 1</b></p>

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

**Strand 4: Integrating Faith by teaching that God loves His creation and continually cares and provides for it.**

1. Organisms are interdependent with one another and with their environment	
	<b>Sixth</b>
<b>A</b>	<i>Scope and Sequence – Ecosystems and Populations</i>
<b>All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem</b>	<p>a. Identify the biotic factors (populations of organisms) and abiotic factors (e.g., quantity of light and water, range of temperatures, soil composition) that make up an ecosystem</p> <p><b>Curriculum</b>            Food Chain  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=381">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=381</a>            Pond Ecosystem  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=664">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=664</a></p>
<b>DOK</b>	<b>a – 2</b>
<b>B</b>	<i>Scope and Sequence – Ecosystems and Populations</i>
<b>Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite</b>	<p>a. Identify populations within a community that are in competition with one another for resources</p> <p>b. Identify the factors that affect the number and types of organisms an ecosystem can support (e.g., food availability, abiotic factors such as quantity of light and water, temperature and temperature range, soil composition, disease, competitions from other organisms, predation)</p> <p>c. Predict the possible effects of changes in the number and types of organisms in an ecosystem on the populations of other organisms within that ecosystem</p> <p><b>Curriculum</b>            Pond Ecosystem  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=664">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=664</a>            Food Chain  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=664">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=664</a>            Prairie Ecosystem  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=647">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=647</a>            Rabbit Population by Season  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=380">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=380</a></p>
<b>DOK</b>	<b>a – 2, b – 2, c – 3</b>
<b>DOK</b>	

1. Organisms are interdependent with one another and with their environment -- Continued	
	<b>Sixth</b>
<b>D</b>	<i>Scope and Sequence – Ecosystems and Populations</i>
<b>The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes</b>	<p>a. Describe beneficial and harmful activities of organisms, including humans (e.g., deforestation, overpopulation, water and air pollution, global warming, restoration of natural environments, river bank/coastal stabilization, recycling, channelization, reintroduction of species, depletion of resources), and explain how these activities affect organisms within an ecosystem</p> <p>b. Predict the impact (beneficial or harmful) of a natural environmental change (e.g., forest fire, flood, volcanic eruption, avalanche) on the organisms in an ecosystem</p> <p>c. Describe possible solutions to potentially harmful environmental changes within an ecosystem</p> <p><b>Curriculum</b>            Greenhouse Effect  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=372">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=372</a>            Pond Ecosystem  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=664">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=664</a>            Water Pollution  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=445">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=445</a></p>
<b>DOK</b>	<b>a – 2, b – 3, c – 3</b>

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

2. Matter and energy flow through an ecosystem	
<b>A</b>	<b>Sixth</b>
	<i>Scope and Sequence – Ecosystems and Populations</i>
<b>As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use</b>	<p>a. Diagram and describe the transfer of energy in an aquatic food web and a land food web with reference to producers, consumers, decomposers, scavengers, and predator/prey relationships</p> <p>b. Classify populations of unicellular and multicellular organisms as producers, consumers, and decomposers by the role they serve in the ecosystem</p> <p><b>Curriculum</b>            Forest Ecosystem  <a href="http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=639">http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=639</a>            Prairie Ecosystem  <a href="http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=647">http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=647</a></p>
<b>DOK</b>	<b>a – 3, b – 2</b>
3. Genetic variation sorted by the natural selection process explains evidence of biological evolution	
<b>A</b>	<b>Sixth</b>
	<i>Scope and Sequence – Ecosystems and Populations</i>
<b>Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of organisms and in the fossil record</b>	<p>a. Identify fossils as evidence some types of organisms (e.g., dinosaurs, trilobites, mammoths, giant tree ferns) that once lived in the past, and have since become extinct, have similarities with and differences from organisms living today</p> <p><b>Curriculum</b>            Digging into the Past  <a href="http://teachersnetwork.org/teachnet-lab/ps101/jmclaughlin/fossils.htm">http://teachersnetwork.org/teachnet-lab/ps101/jmclaughlin/fossils.htm</a></p>
<b>DOK</b>	<b>a – 2</b>
<b>C</b>	<i>Scope and Sequence – Ecosystems and Populations</i>
<b>Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem</b>	<p>a. Relate examples of adaptations (specialized structures or behaviors) within a species to its ability to survive in a specific environment (e.g., hollow bones/flight, hollow hair/insulation, dense root structure/compact soil, seeds/food, protection for plant embryo vs. spores, fins/movement in water)</p> <p>b. Predict how certain adaptations, such as behavior, body structure, or coloration, may offer a survival advantage to an organism in a particular environment</p> <p><b>Curriculum</b>            Break students into groups to study examples of different adaptations and present to class</p>
<b>DOK</b>	<b>a – 2, b – 3</b>

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

**Strand 5: Integrating Faith by teaching that God loves His creation and continually cares and provides for it.**

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures	
<b>Sixth</b>	
<b>A</b>	<i>Scope and Sequence – Earth's Resources</i>
<b>The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties</b>	a. Describe the components of soil and other factors that influence soil texture, fertility, and resistance to erosion (e.g., plant roots and debris, bacteria, fungi, worms, rodents) <b>Curriculum</b> Create a soil webs with students while describing soil texture, fertility, and resistance to erosion
<b>DOK</b>	a – 2
<b>B</b>	<i>Scope and Sequence – Earth's Resources</i>
<b>The hydrosphere is composed of water (a material with unique properties), gases, and other materials</b>	a. Identify and describe the properties of water that make it an essential component of the Earth system (e.g., its ability to act as a solvent, its ability to remain as a liquid at most Earth temperatures) <b>Curriculum</b> Study the water cycle through worksheets
<b>DOK</b>	a – 2
<b>Seventh</b>	
<b>C</b>	<i>Scope and Sequence – Weather and Climate</i>
<b>The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles</b>	a. Describe the composition of the Earth's atmosphere (i.e., mixture of gases, water and minute particles) and how it circulates as air masses b. Describe the role atmosphere (e.g., clouds, ozone) plays in precipitation, reflecting and filtering light from the Sun, and trapping heat energy emitted from the Earth's surface <b>Curriculum</b> Coastal Winds and clouds <a href="http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=438">http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=438</a>
<b>DOK</b>	a – 2, b – 2

2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes	
<b>Sixth</b>	
<b>A</b>	<i>Scope and Sequence – Internal Processes and External Events</i>
<b>The Earth's materials and surface features are changed through a variety of external processes</b>	a. Make inferences about the formation of sedimentary rocks from their physical properties (e.g., layering and the presence of fossils indicate sedimentation) b. Explain how the formation of sedimentary rocks depends on weathering and erosion c. Describe how weathering agents and erosional processes (i.e., force of water as it freezes or flows, expansion/contraction due to temperature, force of wind, force of plant roots, action of gravity, chemical decomposition) slowly cause surface changes that create and/or change landforms d. Describe how the Earth's surface and surface materials can change abruptly through the activity of floods, rock/mudslides, or volcanoes <b>Curriculum</b> Rock Cycle <a href="http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=436">http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=436</a>
<b>DOK</b>	a – 3, b – 2, c – 2, d – 2
<b>B</b>	<i>Scope and Sequence – Internal Processes and External Events</i>
<b>There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates</b>	a. Identify events (earthquakes, volcanic eruptions) and the landforms created by them on the Earth's surface that occur at different plate boundaries <b>Curriculum</b> Plate Tectonics <a href="http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=446">http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=446</a>
<b>DOK</b>	a – 2

## 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 -- Continued	
Concept	Sixth
<b>D</b>	<i>Scope and Sequence – Internal Processes and external Events</i>
<b>Changes in the Earth over time can be inferred through rock and fossil evidence</b>	<p>a. Explain the types of fossils and the processes by which they are formed (i.e., replacement, mold and cast, preservation, trace)</p> <p>b. Use fossil evidence to make inferences about changes on Earth and in its environment (i.e., superposition of rock layers, similarities between fossils in different geographical locations, fossils of seashells indicate the area was once underwater)</p> <p><b>Curriculum</b></p> <ul style="list-style-type: none"> <li>• Explain the process of fossilization to children.</li> <li>• Use real fossils or resources, educational posters, to reinforce your lesson on fossils and fossil formation with visuals.</li> <li>• Have Children participate in gathering fossil models, such as plastic toy insects and reptiles, bones or bone models, plant material and shells</li> </ul> <p>Read more: <a href="http://www.ehow.com/way_5423030_fossil-formation-lesson-plan.html#ixzz2YKgs0SRt">http://www.ehow.com/way_5423030_fossil-formation-lesson-plan.html#ixzz2YKgs0SRt</a></p>
DOK	a – 2, b – 3

2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes -- Continued	
Concept	Seventh
<b>E</b>	<i>Scope and Sequence – Weather and Climate</i>
<b>Changes in the form of water as it moves through Earth's systems are described as the water cycle</b>	<p>a. Explain and trace the possible paths of water through the hydrosphere, geosphere, and atmosphere (i.e., the water cycle: evaporation, condensation, precipitation, surface run-off/ groundwater flow)</p> <p>b. Relate the different forms water can take (i.e., snow, rain, sleet, fog, clouds, dew, humidity) as it moves through the water cycle to atmospheric conditions (i.e., temperature, pressure, wind direction and speed, humidity) at a given geographic location</p> <p>c. Explain how thermal energy is transferred throughout the water cycle by the processes of convection, conduction, and radiation</p> <p><b>Curriculum Water Cycle</b></p> <p><a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=435">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=435</a></p>
DOK	a – 2, b – 2, c – 2
<b>F</b>	<i>Scope and Sequence – Weather and Climate</i>
<b>Climate is a description of average weather conditions in a given area due to the transfer of energy and matter through Earth's systems</b>	<p>a. Explain how the differences in surface temperature, due to the different heating and cooling rates of water and soil, affect the temperature and movement of the air above</p> <p>b. Describe the characteristics of air masses (i.e., high/low barometric pressure, temperature) and predict their effect on the weather in a given location</p> <p>c. Identify weather conditions associated with cold fronts and warm fronts</p> <p>d. Identify factors that affect weather patterns in a particular region (e.g., proximity to large bodies of water, latitude, altitude, prevailing wind currents, amount of solar radiation, location with respect to mountain ranges)</p> <p>e. Collect and interpret weather data (e.g., cloud cover, precipitation, wind speed and direction) from weather instruments and maps to explain present day weather and to predict the next day's weather</p> <p>f. Describe the significant changes in temperature and barometric pressure may cause dramatic weather phenomena (i.e., severe thunderstorms, tornadoes, hurricanes)</p> <p>g. Differentiate between weather and climate.</p> <p>h. Identify factors that affect climate (e.g., latitude, altitude, prevailing wind currents, amount of solar radiation)</p> <p><b>Curriculum</b></p> <p>Coastal Winds and Clouds <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=438">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=438</a></p> <p>Hurricane Motion <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=427">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=427</a></p> <p>Weather Maps <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=430">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=430</a></p>
DOK	a – 2, b – 2, c – 1, d – 1, e – 3, f – 1, g – 2, h – 1

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

3. Human activity is dependent upon and affects Earth's resources and systems		
	Sixth	Seventh
<b>A</b>	<i>Scope and Sequence – Earth's Resources</i>	<i>Scope and Sequence – Energy Transformations</i>
<b>Earth's materials are limited natural resources affected by human activity</b>	a. Relate the comparative amounts of fresh water and salt water on the Earth to the availability of water as a resource for living organisms and human activity b. Describe the affect of human activities (e.g., landfills, use of fertilizers and herbicides, farming, septic systems) on the quality of water  <i>Scope and Sequence – Internal Processes and External Events</i>  c. Analyze the ways humans affect the erosion and deposition of soil and rock materials (e.g., clearing of land, planting vegetation, paving land, construction of new buildings, building or removal of dams) and propose possible solutions  <b>Curriculum</b> Study the water cycle Human Activity Impact	a. Distinguish between renewable (e.g., geothermal, hydroelectric) and nonrenewable (e.g., fossil fuel) energy sources  <i>Scope and Sequence – Weather and Climate</i>  b. Provide examples of how the availability of fresh water for humans and other living organisms is dependent upon the water cycle  <b>Curriculum</b> Study and differentiate between renewable and non renewable sources Study the water cycle
<b>DOK</b>	<b>a – 2, b – 2, c – 3</b>	<b>a – 1, b – 2</b>



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

## Strand 6: Integrating Faith by creating a book about the seven days of creation.

1. The universe has observable properties and structure	
	<b>Seventh</b>
<b>A</b>	<i>Scope and Sequence – Objects and Their Motion in the Solar System</i>
<p>The Earth, Sun, and Moon are part of a larger system that includes other planets and smaller celestial bodies</p>	<p>a. Classify celestial bodies in the solar system into categories: Sun, Moon, planets, and other small bodies (i.e., asteroids, comets, meteors), based on physical properties</p> <p>b. Compare and contrast the size, composition, atmosphere, and surface of the planets (inner vs. outer) in our solar system and Earth's moon</p> <p>c. Describe the relative proximity of common celestial bodies (i.e., Sun, Moon, planets, smaller celestial bodies such as comets and meteors, other stars) in the sky to the Earth</p> <p><b>Curriculum</b>            Comparing Earth and Venus  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=374">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=374</a>            Solar System Explorer  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspView&amp;ResourceID=441">http://www.explorelearning.com/index.cfm?method=cResource.dspView&amp;ResourceID=441</a></p>
DOK	<b>a – 2, b – 2, c – 1</b>
<b>B</b>	<i>Scope and Sequence – Objects and Their Motion in the Solar System</i>
<p>The Earth has a composition and location suitable to sustain life</p>	<p>a. Describe how the Earth's placement in the solar system is favorable to sustain life (i.e., distance from the Sun, temperature, atmosphere)</p> <p>b. Compare and contrast the characteristics of Earth that support life with the characteristics of other planets that are considered favorable or unfavorable to life (e.g., atmospheric gases, extremely high/low temperatures)</p> <p><b>Curriculum</b>            Solar System Explorer  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspView&amp;ResourceID=441">http://www.explorelearning.com/index.cfm?method=cResource.dspView&amp;ResourceID=441</a></p>
DOK	<b>a – 2, b – 2</b>
<b>C</b>	<i>Scope and Sequence – Objects and Their Motion in the Solar System</i>
<p>Most of the information we know about the universe comes from the electromagnetic spectrum</p>	<p>a. Explain that stars are separated from one another by vast and different distances, which causes stars to appear smaller than the Sun</p> <p>b. Compare the distance light travels from the Sun to Earth to the distance light travels from other stars to Earth using light years</p> <p><b>Curriculum</b>            H-R Diagram  <a href="http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=429">http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=429</a></p>
DOK	<b>a – 1, b – 2</b>

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

<b>2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces</b>	
<b>Seventh</b>	
<b>A</b>	<i>Scope and Sequence – Objects and Their Motion in the Solar System</i>
<b>The apparent position of the Sun and other stars, as seen from Earth, change in observable patterns</b>	<p>a. Relate the apparent east-to-west changes in the positions of the Sun, other stars, and planets in the sky over the course of a day to Earth’s counterclockwise rotation about its axis</p> <p>b. Describe the pattern that can be observed in the changes in number of hours of visible sunlight, and the time and location of sunrise and sunset, throughout the year</p> <p>c. Describe how, in the Northern Hemisphere, the Sun appears lower in the sky during the winter and higher in the sky during the summer</p> <p>d. Describe how, in winter, the Sun appears to rise in the Southeast and set in the Southwest, accounting for a relatively short day length, and, in summer, the Sun appears to rise in the Northeast and set in the Northwest, accounting for a relatively long day length</p> <p>e. Describe how the Sun is never directly overhead when observed from North America</p> <p><b>Curriculum</b>            Comparing Earth and Venus  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=374">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=374</a>            Seasons in 3D  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=463">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=463</a>            Seasons: Earth, Moon, and Sun  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=468">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=468</a></p>
<b>DOK</b>	<b>a – 2, b – 1, c – 1, d – 1, e – 1</b>
<b>B</b>	<i>Scope and Sequence – Objects and Their Motion in the Solar System</i>
<b>The apparent position of the Moon, as seen from Earth, and its actual position relative to Earth change in observable patterns</b>	<p>a. Observe the change in time and location of Moon rise, Moon set, and the Moon’s appearance relative to time of day and month over several months, and note the pattern in this change</p> <p>b. Describe how the Moon rises later each day due to its revolution around the Earth in a counterclockwise direction</p> <p>c. Describe how the Moon is in the sky for roughly 12 hours in a 24-hour period (i.e., if the Moon rises at about 6 P.M., it will set at about 6 A.M.)</p> <p>d. Describe how that one half of the Moon is always facing the Sun and, therefore, one half of the Moon is always lit</p> <p>e. Relate the apparent change in the Moon’s position in the sky as it appears to move east-to-west over the course of a day to Earth’s counterclockwise rotation about its axis</p> <p>f. Describe how the appearance of the Moon that can be seen from Earth changes approximately every 28 days in an observable pattern (moon phases)</p> <p><b>Curriculum</b>            Moonrise, Moonset, and Phases  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=457">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=457</a>            Phases of the Moon  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=613">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=613</a>            Seasons: Earth, Moon, and Sun  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=468">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=468</a></p>
<b>DOK</b>	<b>a – 2, b – 1, c – 1, d – 1, e – 2, f – 1</b>

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

2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces -- Continued	
<b>C</b>	<b>Seventh</b>
<p><b>The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons</b></p>	<p><i>Scope and Sequence – Objects and Their Motion in the Solar System</i></p> <ol style="list-style-type: none"> <li>a. Illustrate and explain a day as the time it takes a planet to make a full rotation about its axis</li> <li>b. Diagram the path (orbital ellipse) the Earth travels as it revolves around the Sun</li> <li>c. Illustrate and explain a year as the time it takes a planet to revolve around the Sun</li> <li>d. Explain the relationships between a planet’s length of year (period of revolution) and its position in the solar system</li> <li>e. Recognize and explain the phases of the moon are due to the relative positions of the Moon with respect to the Earth and Sun</li> <li>f. Relate the axial tilt and orbital position of the Earth as it revolves around the Sun to the intensity of sunlight falling on different parts of the Earth during different seasons</li> </ol> <p>Comparing Earth and Venus</p> <p><b>Curriculum</b></p> <p>Seasons: Earth, Moon, and Sun  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=468">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=468</a></p> <p>Gravity Pitch  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=648">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=648</a></p> <p>Comparing Earth and Venus  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=374">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=374</a></p> <p>Solar System Explorer  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=441">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=441</a></p> <p>Moonrise, Moonset, and Phases  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=457">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=457</a></p> <p>Phases of the Moon  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=613">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=613</a></p> <p>Seasons in 3D  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=463">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=463</a></p> <p>Seasons: Why do we have them?  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=407">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=407</a></p> <p>Summer and Winter  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=656">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=656</a></p>
<b>DOK</b>	<b>a – 1, b – 1, c – 1, d – 2, e – 2, f – 2</b>
<b>D</b>	<i>Scope and Sequence – Objects and Their Motion in the Solar System</i>
<p><b>Gravity is a force of attraction between objects in the solar system that governs their motion</b></p>	<ol style="list-style-type: none"> <li>a. Describe how the Earth’s gravity pulls any object on or near the Earth toward it (including natural and artificial satellites)</li> <li>b. Describe how the planets’ gravitational pull keeps satellites and moons in orbit around them</li> <li>c. Describe how the Sun’s gravitational pull holds the Earth and other planets in their orbits</li> </ol> <p><b>Curriculum</b></p> <p>Beam to Moon (Ratios and Proportions)  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=98">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=98</a></p> <p>Gravity Pitch  <a href="http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=648">http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&amp;ResourceID=648</a></p>
<b>DOK</b>	<b>a – 1, b – 1, c – 1</b>

## Strand 7: Scientific Inquiry

**Strand 7: Integrating faith by helping students understand how to use scientific principles to explore, discover, and classify God’s creation.**

<b>1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</b>		
	<b>Sixth</b>	<b>Seventh</b>
<b>A</b>	<i>Scope and Sequence - All Units</i>	<i>Scope and Sequence - All Units</i>
<b>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</b>	<ul style="list-style-type: none"> <li>a. Formulate testable questions and hypotheses</li> <li>b. Identify and describe the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment</li> <li>c. Design and conduct a valid experiment</li> <li>d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment</li> <li>e. Recognize different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models)</li> </ul> <p><b>Curriculum</b>            Science Experiment List  <a href="http://www.kids-sciece-experiments.com/experiments.html">http://www.kids-sciece-experiments.com/experiments.html</a></p>	<ul style="list-style-type: none"> <li>a. Formulate testable questions and hypotheses</li> <li>b. Identify and describe the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment</li> <li>c. Design and conduct a valid experiment</li> <li>d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment</li> <li>e. Recognize that different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models)</li> <li>f. Acknowledge there is no fixed procedure called “the scientific method”, but some investigations involve systematic observations, carefully collected and relevant evidence, logical reasoning, and imagination in developing hypotheses and other explanations</li> </ul> <p><b>Curriculum</b>            Science Experiment List  <a href="http://www.kids-sciece-experiments.com/experiments.html">http://www.kids-sciece-experiments.com/experiments.html</a></p>
<b>DOK</b>	<b>a – 2, b – 2, c – 4, d – 3, e – 2</b>	<b>a – 2, b – 2, c – 4, d – 3, e – 2, f – 1</b>
<b>B</b>	<i>Scope and Sequence - All Units</i>	<i>Scope and Sequence - All Units</i>
<b>Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</b>	<ul style="list-style-type: none"> <li>a. Make qualitative observations using the five senses</li> <li>b. Determine the appropriate tools and techniques to collect data</li> <li>c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, computers, spring scales, balances, magnets, metric rulers, graduated cylinders, stopwatches)</li> <li>d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, temperature to the nearest degree Celsius, force (weight) to the nearest Newton, time to the nearest second</li> <li>e. Compare amounts/measurements</li> <li>f. Judge whether measurements and computation of quantities are reasonable</li> </ul> <p><b>Curriculum</b>            Science Experiment List  <a href="http://www.kids-sciece-experiments.com/experiments.html">http://www.kids-sciece-experiments.com/experiments.html</a></p>	<ul style="list-style-type: none"> <li>a. Make qualitative observations using the five senses</li> <li>b. Determine the appropriate tools and techniques to collect data</li> <li>c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches)</li> <li>d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second</li> <li>e. Compare amounts/measurements</li> <li>f. Judge whether measurements and computation of quantities are reasonable</li> <li>g. Calculate the range and average/mean of a set of data</li> </ul> <p><b>Curriculum</b>            Science Experiment List  <a href="http://www.kids-sciece-experiments.com/experiments.html">http://www.kids-sciece-experiments.com/experiments.html</a></p>
<b>DOK</b>	<b>a – 1, b – 2, c – 1, d – 1, e – 2, f – 3</b>	<b>a – 1, b – 2, c – 1, d – 1, e – 2, f – 3, g – 1</b>

## Strand 7: Scientific Inquiry

<b>1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking--Continued</b>		
	<b>Sixth</b>	<b>Seventh</b>
<b>C</b>	<i>Scope and Sequence - All Units</i>	<i>Scope and Sequence - All Units</i>
<b>Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) in light of evidence (data) and scientific principles (understandings)</b>	a. Use quantitative and qualitative data as support for reasonable explanations (conclusions) b. Use data as support for observed patterns and relationships, and to make predictions to be tested c. Determine the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions) d. Evaluate the reasonableness of an explanation (conclusion) e. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories) <b>Curriculum</b> Science Experiment List <a href="http://www.kids-sciece-experiments.com/experiments.html">http://www.kids-sciece-experiments.com/experiments.html</a>	a. Use quantitative and qualitative data as support for reasonable explanations (conclusions) b. Use data as support for observed patterns and relationships, and to make predictions to be tested c. Determine the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions) d. Evaluate the reasonableness of an explanation (conclusion) e. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories) <b>Curriculum</b> Science Experiment List <a href="http://www.kids-sciece-experiments.com/experiments.html">http://www.kids-sciece-experiments.com/experiments.html</a>
<b>DOK</b>	<b>a – 2, b – 2, c – 2, d – 3, e -2</b>	<b>a – 2, b – 2, c – 2, d – 3, e -2</b>
<b>D</b>	<i>Scope and Sequence - All Units</i>	<i>Scope and Sequence - All Units</i>
<b>The nature of science relies upon communication of results and justification of explanations</b>	a. Communicate the procedures and results of investigations and explanations through: ⇒ oral presentations ⇒ drawings and maps ⇒ data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities) ⇒ graphs (bar, single line, pictograph) ⇒ writings <b>Curriculum</b> Role-play as members of a team from a community health department. The student teams develop testable questions and investigate a possible health problem in the local school district. Students develop their understanding of inquiry by looking for patterns in attendance data, comparing dates of activities with the onset of increased absences, and analyzing maps, graphs, and data tables. Students complete their investigation by proposing possible sources of the health problem and describing how the sources might be confirmed or refuted.	a. Communicate the procedures and results of investigations and explanations through: ⇒ oral presentations ⇒ drawings and maps ⇒ data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities) ⇒ graphs (bar, single line, pictograph) ⇒ equations and writings <b>Curriculum</b> Role-play as members of a team from a community health department. The student teams develop testable questions and investigate a possible health problem in the local school district. Students develop their understanding of inquiry by looking for patterns in attendance data, comparing dates of activities with the onset of increased absences, and analyzing maps, graphs, and data tables. Students complete their investigation by proposing possible sources of the health problem and describing how the sources might be confirmed or refuted.
<b>DOK</b>	<b>a – 2</b>	<b>a – 2</b>

## Strand 8: Impact of Science, Technology and Human Activity

**Strand 8:** Integrating faith by helping students understand how to use scientific principles to explore, discover, and classify God’s creation.

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			
	Sixth	Seventh	Eighth
<b>A</b>	<i>Scope and Sequence - All Units</i>		
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. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers) <b>Curriculum</b> Research, evaluate information and present to class		
DOK	a – 2	a – 2	a – 2
<b>B</b>	<i>Scope and Sequence - All Units</i>		
Advances in technology often result in improved data collection and an increase in scientific information	a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity) <b>Curriculum</b> Research, evaluate information and present to class		
DOK	a – 2	a – 2	a – 2
<b>C</b>	<i>Scope and Sequence - All Units</i>		
Technological solutions to problems often have drawbacks as well as benefits	a. Describe how technological solutions to problems (e.g., storm water runoff, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks) (Assess Locally) <b>Curriculum</b> Research, evaluate information and present to class		
DOK	a – 2	a – 2	a – 2

2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time			
	Sixth	Seventh	Eighth
<b>A</b>	<i>Scope and Sequence - All Units</i>		
People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations	a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson) (Assess Locally) <b>Curriculum</b> Research, evaluate information and present to class		

DOK	a – 2	a – 2	a – 2
<b>B</b>	<i>Scope and Sequence - All Units</i>		
<b>Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity</b>	<p>a. Describe the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton)</p> <p>b. Describe explanations have changed over time as a result of new evidence</p> <p><b>Curriculum</b> Research, evaluate information and present to class</p>		
DOK	a – 2, b – 2	a – 2, b – 2	a – 2, b – 2

<b>3. Science and technology affect, and are affected by, society</b>			
	<b>Sixth</b>		<b>Seventh</b>
<b>B</b>	<i>Scope and Sequence - All Units</i>		
<b>Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology</b>	<p>a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research)</p> <p>b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS)</p> <p><b>Curriculum</b> Research, evaluate information and write a persuasive speech to be presented to class</p>		
DOK	a – 2, b – 3	a – 2, b – 3	a – 2, b – 3