4th Grade Science
Curriculum Guide
2016/2017
**Unit: Introduction**

**Timeline:** 3-5 sessions

**Student Outcomes:**

> *All references to Schoology may be found under 4th grade Group, Resources, Science, 2015-2016 Curriculum Guide Resources.*

**Instruction:**

Students need to be familiar with the scientific method. However, students working in the middle and high school level are currently using a new approach for some scientific investigations. This approach includes a claim, evidence, reasoning, and rebuttal (C.E.R.R.). Using this framework throughout all content areas will prepare students for success in upper grade levels.

**Scientific Method**

- Ask a question
- Do background research
- Construct a hypothesis
- Test your hypothesis by doing an experiment
- Analyze your data and draw a conclusion
- Communicate your results

**C.E.R.R. Framework**

- **Claims:** A concluding statement that answers the question asked or the problem posed.
- **Evidence:** Scientific data that supports the claim. The data needs to be appropriate and sufficient to support the claim
- **Reasoning:** A justification that connects the evidence to the claim. It shows why data counts as evidence by using appropriate and sufficient scientific principles.
- **Rebuttal:** Recognizes and describes alternative explanations and provides counter evidence and reasoning for the alternative.

**Classroom procedures beginning each investigation should be reinforced during the first session of each unit.**

**Lesson 1: Setting up the Science Notebook and Safety**

- Resources for how to set up the scientific notebook are located on Schoology. Address health and safety issues regarding student participation.
- Prepare student science notebooks for the unit.
<table>
<thead>
<tr>
<th><strong>Lesson 2 (Optional): Observation</strong></th>
<th><strong>Lesson 3 (Optional): Saving Sam</strong></th>
</tr>
</thead>
</table>
| - The “Orange” Observation is located on Schoology. This is a step by step process teaching how to make observations. Teachers will need to provide oranges.  
- Discuss cooperative responsibilities while working collaboratively as a team. | - Introduce students to the scientific method. Teachers will need to provide resources to conduct the experiment. Lesson plan is located in Schoology.  
It is important to introduce the scientific method to students, but other resources can be used to replace or supplement these lessons. |

**Focus Questions:**
- Why do scientists need to follow safety procedures?  
- Why are observations important to science?  
- How does the scientific method help scientists?  

**Vocabulary:** claim, evidence, rebuttal, reasoning, question, hypothesis, observation, analyze, data

**Assessments:** N/A
**Unit: Forms of Energy (20-25 Sessions)**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Physical Science Standard 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Competence</td>
<td>Apply an understanding that energy in varicose forms, and it’s transformation and conservation occur in processes that are predictable and measureable</td>
</tr>
<tr>
<td>Grade Level Expectation</td>
<td>Energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical</td>
</tr>
<tr>
<td>Big Idea</td>
<td>Energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical</td>
</tr>
<tr>
<td>End of unit Performance Task</td>
<td>Problem analysis: Imagine you are decorating our classroom with strings of lights. Which type of lights would you use and why? Identify pros and cons of the different types of lights. What problems might you encounter? What are possible solutions if a light bulb goes out? What is your cost assessment? <strong>Use FOSS Magnetism and Electricity Kit Investigation 3, Advanced Connections to assist in planning for this task. May be helpful to research costs of different light types prior to doing this task.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Outcomes</th>
<th>Core Concepts:</th>
<th>Nature of Science</th>
<th>Literacy Standards Focus</th>
<th>Writing Standard Focus</th>
<th>Reading/writing Focus Cross Content Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Identify and describe the variety of energy sources. (DOK 1)</td>
<td>• An electric circuit is a complete pathway through which electric current flows from a source of electric energy to components. • Electricity transfers energy that can produce heat, light, sound, and motion. • Electricity can be produced from a variety of sources. • Conductors are materials through which electric current can flow; all metals are conductors. • Energy is present whenever there are moving objects, sound, light, or heat. • Energy can be generated by fossil fuels or renewable sources. • In series circuits, there is a single pathway from</td>
<td>1. Ask testable questions about energy, make a falsifiable hypothesis and design an inquiry-based method of finding the answer, collect data, and form a conclusion. (DOK 2-4) 2. Understand that models are developed to explain and predict phenomena that cannot be directly observed. (DOK 1) 3. Critically evaluate models of energy, identifying the strengths and weaknesses of the model in representing what happens in the real world. (DOK 2-3) 4. Create plans to decrease electrical</td>
<td>RI 4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.</td>
<td>W 4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.</td>
<td>Use reading, technology, and/or resources to create written products to demonstrate understanding of GLEs. Use written notes, readings, and/or technology to create a model of a circuit. The Performance Task requires students to do a written analysis of the type of circuit that would be better for a string of lights. This could also be connected to math, because students could also determine the cost analysis of each type of light.</td>
</tr>
<tr>
<td>the energy source to the components; in parallel circuits each component has its own direct pathway to the energy source.</td>
<td>energy use for one week and evaluate the results. (DOK 2-4)</td>
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<tr>
<td>• Two bulbs can be lit dimly using a series circuit and brightly through a parallel circuit.</td>
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<tr>
<td>• Magnets interact with each other and with some materials.</td>
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<tr>
<td>• Magnets have two poles. Like poles repel and opposite poles attract.</td>
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<tr>
<td>• Electricity can create an electromagnet.</td>
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<tr>
<td>• Magnets are surrounded by an invisible magnetic field.</td>
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# Forms of Energy

**Unit:** Forms of Energy  

**Timeline:** 20 – 25 Sessions (These are suggested timelines. Timelines may be adjusted with regard to individual building scheduling needs.)

**Standard:** Physical Science Standard 1

**Grade Level Expectation:** 1. Energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical

## Student Outcomes:

1.a. Identify and describe the variety of energy sources (DOK 1)

1.b. Show that electricity in circuits requires a complete loop through which current can pass (DOK 1)

1.c. Describe the energy transformation that takes place in electrical circuits where light, heat, sound, and magnetic effects are produced (DOK 1-2)

1.d. Use multiple resources – including print, electronic, and human – to locate information about different sources of renewable and nonrenewable energy (DOK 1-2)

## Instruction:

**Introduction:** KWL about Energy: Begin with the “What I Already Know” column and “What I Want to Know” column. Come back to the “What I Learned” column at the end of the unit.

**Target:** Energy comes from a variety of renewable and nonrenewable sources.

**Online Link:** [http://www.eia.gov/kids/energy.cfm?page=2](http://www.eia.gov/kids/energy.cfm?page=2)

- This online link gives information about the different forms of energy students will learn about in this unit.

### Using the FOSS Kit

**Investigation 1:** The Force  
**Part 1:** Investigating Magnets and Materials  
**Guiding Question:** What materials attract magnets?  
**Target:** Magnetism is a force that can be used as a form of energy.  
**Check for Understanding:** Describe what happens when two magnets come together.  
**Optional:** Use Student Sheet #3 to help guide the investigation. If you use this sheet, the check for understanding question is on that page.

**Part 2:** Investigating More Magnetic Properties  
**Guiding Question:** Can the force of magnetism go through materials?  
**Target:** Magnetism is a force that can be used as a form of energy.  
**Check for Understanding:** Student Sheet #4

**Investigation 2:** Making Connections  
**Part 1:** Lighting a Bulb  
**Guiding Questions:**
- How can you get electricity from a source to a receiver?  
- How does electricity flow through a circuit?  
**Target:** Electricity is a form of energy that flows through a circuit that can be transformed into light energy.
Note: Expose students to schematic drawings of circuits.
Make sure to have students draw diagrams using arrows to show how electricity flows from the D-cell battery to the bulb to make it light.

Check for Understanding: Student Sheets #8 and #9

Part 2: Making a Motor Run

Guiding Questions:
- How is the motor circuit like the bulb circuit?
- What does a switch do in a circuit?

Target: Electricity is a form of energy that flows through a circuit that can be transformed into different forms of energy.

Check for Understanding: Write instructions on how to set up a circuit that produces mechanical energy.

- Have a classroom discussion about how energy is transformed. Energy transformation is a big part of the physical science standard, so students need to understand how electrical energy is transformed into light, mechanical, and sound energy.
- If more resources are needed for this standard, there is an online simulation demo to give students an interactive mini lesson about energy transformations: http://www.science4us.com/elementary-physical-science/energy/energy-transformations/
- Another useful website that gives kid friendly information about energy and energy transformations: http://kids.britannica.com/comptons/art-167499/Energy-cannot-be-created-or-destroyed-but-it-can-change

Part 3: Finding Conductors and Insulators

Guiding Question: How do you know if a material is a conductor or insulator?

Target: Materials that allow the flow of electric current are conductors; insulators do not allow the flow of electricity.

Check for Understanding: What do you notice that is similar about all the conductors? What can you say about the insulators?

Optional: Use Student Sheet #10 to help guide the investigation. If you use this sheet, the “check for understanding” question is on that page.

Part 4: Investigating Mystery Circuits

Guiding Question: How can I use conductors to light a bulb?
Target: Students will be able to determine where the wires are located on a mystery board and explain how a circuit is completed.

Check for Understanding: Students can draw each mystery board in their notebooks and show how they connected the wires to make the light bulb light. (Look at Teacher Sheet #13 for an example if more guidance is needed.)

Investigation 3: Advanced Connections
Part 1: Building Series Circuits
Guiding Questions:
- Can you get two bulbs to light at the same time?
- Can you make two lights bright in a series circuit?
Target: A circuit with only one pathway for an electric current is a series circuit.

Part 2: Building Parallel Circuits
Guiding Questions:
- Can you light two bulbs brightly with just one battery?
- How many different ways can you wire a parallel circuit?
Target: Components in a parallel circuit have a direct pathway to the energy source.

Check for Understanding (Part 1 and 2): Student Sheet #16

Optional Investigation 4: Current Attractions
Part 1: Building an Electromagnet
Guiding Question: Can you make a magnet that turns on and off?
Target: The magnetism produced by an electromagnet can be turned on and off.
Check for Understanding: Student Sheet #20

Renewable and Nonrenewable resources are not included within FOSS.
The following investigation and articles will help supplement the standard.

Vocabulary Activity: I Have - Who Has
This lesson teaches vocabulary related to energy awareness, conservation, the future of energy, and safety. See website below:

Articles to Teach Renewable and Nonrenewable Energy:
https://newsela.com/articles/climate-procon/id/2271/
To view this article, teachers can create a free account through the newsela website. The article gives the pros and cons of making climate change laws. This is an important part of Standard 1.1.d that should be used to teach about renewable and nonrenewable energy using different sources.

http://www.readworks.org/passages/catch-breeze

To view this article, teachers can create a free account through the readworks website. The article is about wind energy and how it is important as a renewable energy source. This is an important part of Standard 1.1.d that should be used to teach about renewable energy using different sources.

http://www.readworks.org/passages/energy-life

To view this article, teachers can create a free account through the readworks website. The article is about the importance of using renewable energy, and it addresses some of the concerns of continuing to use nonrenewable energy sources. This is an important part of Standard 1.1.d that should be used to teach about renewable energy using different sources.

Understanding Solar Energy Investigation:
Guiding question: How can we use the sun to harness energy and then convert that energy into a different source?
Target: Solar energy can be converted into heat energy.

Focus Questions:
- What is needed to light a bulb?
- What does energy do in a circuit with a motor?
- What is needed to make a complete pathway for current to flow in a circuit?
- What do we observe that provides evidence that energy is present?
- How can you get two bulbs to

Vocabulary:
**Academic**
- hypothesis, identify, describe, data, conclusion, predict, explain, evaluate, develop, justify, analyze, testable question, results, design, model, claim, evidence, reasoning

**Technical**
- force, magnetism, attract, repel, poles, electricity source, electricity receiver, circuit, circuit base,

Assessments:
End of Unit Performance Task:
Problem analysis: Imagine you are decorating our classroom with strings of lights. Which type of circuit for the lights would you use and why? Identify pros and cons of the different types of circuits. What problems might you encounter? What are possible solutions if a light bulb goes out? What is your cost assessment?

- Use FOSS kit Investigation 3, Advanced Connections, to assist in planning for this task. It also might be helpful to research costs of the different types of lights for your class prior to starting this task.
| light at the same time?  
• Which design is better for manufacturing a long string of lights – series or parallel?  
• How can you make a motor run faster using a solar cell?  
• What materials are attracted to a magnet?  
• What happens when two or more magnets interact?  
• Can you make a magnet that turns on and off?  
• What are the differences between renewable and nonrenewable energy sources?  
• How can we use the sun to harness energy and then convert that energy into a different source?  
• How do we know that energy exists within a system such as in an electrical circuit?  
• How is electricity used to create heat, light, sound, and motion?  
• How can we justify the use of our nonrenewable resources? | switch, open circuit, closed circuit, energy transformation, conductor, insulator, motor, series circuit, parallel circuit, renewable energy, nonrenewable energy | Formative Assessments:  
• End of unit test  
• Checks for understanding are embedded within each investigation to use as needed to check for understanding. |

| Science Resources:  
Energy Link to Introduce Energy Types:  
http://www.eia.gov/kids/energy.cfm?page=2  
Vocabulary Activity for Renewable and Nonrenewable Energy:  
I Have - Who Has (Website listed below)  
http://www.alliantenergykids.com/wcm/groups/wcm_internet/@i | Literacy Resources:  
Foss Science Stories:  
• Magnetism and Electricity  
• Magnus Gets Stuck  
• Magnificent Magnetic Models  
• How Magnets Interact  
Readworks Article about Electric and Magnetic Forces: |
| Online simulation demo about energy transformations:  |
| http://www.science4us.com/elementary-physical-science/energy/energy-transformations/ |
| Information about energy and energy transformations:  |
| http://kids.britannica.com/comptons/art-167499/Energy-cannot-be-created-or-destroyed-but-it-can-change |
| Video Clip on Energy (Bill Nye):  |
| https://www.youtube.com/watch?v=0ASLLiuejAo |
| Video Clip – Fossil-Fueled Electricity:  |
| http://www.neok12.com/video/Energy-Sources/zX79550778037a5a42185e5d.htm |
| Scholarships for Museum to You classes are available through the Denver Museum of Nature and Science:  |
| Rocket Works Class:  |
| http://www.dmns.org/teachers/at-your-school/classes/rocket-works/ |
| Electric and Magnetic Forces and the Modern Day Compass  |
| https://www.readworks.org/passages/electric-and-magnetic-forces-and-modern-day-compass |
| Readworks Article about Electricity:  |
| Electricity & Energy Circuit  |
| https://www.readworks.org/passages/electricity-energy-circuits |
| Alternative Energy for Kids:  |
| The instructional section for alternative energy also includes literacy resources. The articles were included in the instructional section because the standard requires students to use different sources to locate information about renewable and nonrenewable energy.  |
| https://newsela.com/articles/climate-procon/id/2271/  |
| http://www.readworks.org/passages/catch-breeze  |
| http://www.readworks.org/passages/energy-life |
## Unit: Survival (7-9 sessions)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Life Science Standard 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Competence</td>
<td>Analyze how various organisms grow, develop, and differentiate during their lifetimes based on an interplay between genetics and their environment</td>
</tr>
<tr>
<td>Grade Level Expectation</td>
<td>1. All living things share similar characteristics, but they also have differences that can be described and classified</td>
</tr>
<tr>
<td>Big Idea</td>
<td>All living things share similar characteristics, but they also have differences that can be described and classified</td>
</tr>
<tr>
<td>End of unit Performance Task</td>
<td>Use Pretend Profiles found in Colorado Wildlife Kit student assessments</td>
</tr>
</tbody>
</table>

### Student Outcomes

<table>
<thead>
<tr>
<th>Core Concepts</th>
<th>Nature of Science</th>
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<th>Writing Standard Focus</th>
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<tbody>
<tr>
<td>a. Use evidence to develop a scientific explanation of what plants and animals need to survive. (DOK 1-3)</td>
<td>• Organisms are classified according to characteristics. • Plants need water, light, air, temperature and space to live. • Animals need food, water, air, shelter, and space to survive. • Plants make their own food by photosynthesis. (Producers) • Animals obtain food by eating other organisms. (Consumers) • Animals can be classified into different groups: mammals, amphibians, reptiles, birds, and fish. • Animals can also be classified vertebrate and invertebrate.</td>
<td>1. Understand that all scientific knowledge is subject to new findings and that the presence of reproducible results yields a scientific theory. (DOK 1) 2. Evaluate and provide feedback on evidence used by others to justify how they classified organisms. (DOK 2-3)</td>
<td>RI 4.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. W 4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</td>
<td>Use reading resources from the Colorado Wildlife Kit to research animal adaptation and write an explanation as to why animals adapt to certain environments. Use reading, technology, and/or resources to create written products to demonstrate understanding of GLEs.</td>
</tr>
<tr>
<td>b. Use evidence to develop a scientific explanation for similarities and/or differences among different organisms (species). (DOK 1-3)</td>
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<tr>
<td>c. Analyze and interpret data representing variation in a trait. (DOK 1-2)</td>
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<tr>
<td>d. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate questions about characteristics of living things. (DOK 1-2)</td>
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</table>

Revised May 2016
- Insects are invertebrates.
- Individuals of the same kind of organism differ in their characteristics; differences may give individuals an advantage in surviving and reproducing.

Provide a concluding statement or section related to the information or explanation presented.
Unit: Survival  
Rating: 4th Grade  
Timeline: 7-9 sessions

Standard: Life Science Standard 2

Grade Level Expectation: 1. All living things share similar characteristics, but they also have differences that can be described and classified.

<table>
<thead>
<tr>
<th>Student Outcomes:</th>
<th>Instruction:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.a. Use evidence to develop a scientific explanation of what plants and animals need to survive (DOK 1-3)</td>
<td><strong>Introduction Lesson</strong>: Create an anchor chart of what animals and plants need to survive.</td>
</tr>
<tr>
<td>1.b. Use evidence to develop a scientific explanation for similarities and/or differences among different organisms (species) (DOK 1-3)</td>
<td><strong>Video</strong>: This is a great video to show at some point while teaching this standard. The video explains different types of animal adaptations to the environment and why the trait is needed to change to adapt: <a href="https://www.youtube.com/watch?v=z4xFDjy3uT8">https://www.youtube.com/watch?v=z4xFDjy3uT8</a></td>
</tr>
<tr>
<td>1.c. Analyze and interpret data representing variation in a trait (DOK 1-2)</td>
<td>See Life Science Vocabulary Review pdf on Schoology</td>
</tr>
</tbody>
</table>
| 1.d. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate questions about characteristics of living things (DOK 1-2) | **Lesson 1: Vertebrate Bag**  
**Colorado Wildlife Teacher’s Manual** pages 47-81  
**Guiding Question**: How would you classify the different vertebrates?  
**Target**: Vertebrates are classified according to their traits.  
*May use animal track station, located on page 61-74, to connect to trace fossils. One form of a trace fossil are animal tracks. By identifying the track (or trace fossil), a student may be able to connect the animal to the environment the animal lived in.  
**Check for Understanding**: Vertebrate Matrix page 81 A  
**Literacy Link**: Vertebrate brochures: Birds, Mammals, Amphibians, Fish, Reptiles |
|                                                                                 | **Lesson 2: Shell Shocked**  
**Colorado Wildlife Teacher’s Manual** pages 91-94  
**Guiding question**: How do different physical characteristics help an animal adapt to its environment?  
**Target**: An animal’s physical characteristics enable it to adapt to its environment for survival.  
**Check for Understanding**: How has the box turtle adapted to its environment? Why did it need to do this to survive? |

Revised May 2016
<table>
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<tr>
<th>Focus Questions:</th>
<th>Vocabulary:</th>
<th>Assessments:</th>
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</thead>
<tbody>
<tr>
<td>Why do plants and animals need to adapt to survive?</td>
<td><strong>Academic:</strong> identify, data, interpret, evaluate, question, interaction, compare, contrast&lt;br&gt;&lt;br&gt;<strong>Technical:</strong> organisms, traits, survive, variations, characteristics, classification, ecosystems, habitat, adaptations, species</td>
<td><strong>End of Unit Performance Task:</strong> Use the Pretend Profile lesson found in Colorado Wildlife Kit under Student Assessments</td>
</tr>
<tr>
<td>How does trait variation benefit plants and animals?</td>
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<td><strong>Formative Assessment:</strong> End of unit test part 1</td>
</tr>
</tbody>
</table>

**Lesson 3: Better Beaks**<br><br>**Colorado Wildlife Teacher's Manual** pages 149-154<br><br>**Guiding Question:**<br>How can a species survive by adapting to their environment?<br><br>**Target:** The adaptation of traits help a species survive in their environment.<br><br>**Check for Understanding:** How are beaks an example of a trait variation adapted for survival?<br><br>**Science Resources:**<br>- The flowing link has a lesson for alterations of ecosystems which leads to why animals need to adapt to changes if there is a change in the environment. [http://www.uen.org/Lessonplan/preview?LPid=25212](http://www.uen.org/Lessonplan/preview?LPid=25212)<br>- Lesson plans for ecosystems [http://sbsciencematters.com/lesson-units/4th-grade/4life-ecosystems/](http://sbsciencematters.com/lesson-units/4th-grade/4life-ecosystems/)<br>- Poudre Learning Center: For hands-on, real life experiences<br>- Scholarships for Museum to You classes through the Denver Nature and Science Museum, Colorado Wildlife Adventures class: [http://www.dmns.org/teachers/at-your-school/classes/](http://www.dmns.org/teachers/at-your-school/classes/)<br><br>**Literacy Resources:**<br>- Brochure on each life zone<br>- Brochure on animals from each life zone.<br>- My World Social Studies:<br>  Regions of Colorado: p. 84-89<br>- Adaptation (need to get book): [http://www.readworks.org/lessons/grade4/olivia%E2%80%99s-birds-saving-gulf/read-aloud-lesson](http://www.readworks.org/lessons/grade4/olivia%E2%80%99s-birds-saving-gulf/read-aloud-lesson)<br>- Survival (need to get book): [http://www.readworks.org/lessons/grade4/mangrove-tree/read-aloud-lesson](http://www.readworks.org/lessons/grade4/mangrove-tree/read-aloud-lesson)
## Unit: Connecting to the Past (7-9 sessions)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Life Science Standard 2</th>
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<tbody>
<tr>
<td>Graduate Competence</td>
<td>Explain how biological evolution accounts for the unity and diversity of living organisms</td>
</tr>
<tr>
<td>Grade Level Expectation</td>
<td>2. Comparing fossils to each other or to living organisms reveals features of prehistoric environments and provides information about organisms today</td>
</tr>
<tr>
<td>Big Idea</td>
<td>Comparing fossils to each other or to living organisms reveals features of prehistoric environments and provides information about organisms today</td>
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<tr>
<td>End of unit Performance Task</td>
<td>Pretend you are a paleontologist from the year 52,016. You just discovered a new fossil that dates back to 2016. Create a brochure that identifies the fossil, describes the environment, and helps explain what other animals and plants lived at that location 50,000 years ago.</td>
</tr>
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<tr>
<td>a. Use evidence to develop a scientific explanation for:</td>
<td>1. Ask testable questions about past environments. (DOK 2)</td>
<td>RI 4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.</td>
<td>W 4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.</td>
<td>Research multiple sources to create technology-based or written brochure and presentation of a “fossil” from the year 2016 (see End of Unit Performance Task).</td>
</tr>
<tr>
<td>1. What fossils tell us about a prehistoric environment? (DOK 1-3)</td>
<td>2. Make predictions about past environments based on fossil evidence. (DOK 2)</td>
<td>a. Apply grade 4 Reading Standards to literature (e.g., “Describe in depth a character, setting, or event in a text [e.g., a character’s thoughts, words, or actions].”). Apply grade 4 Reading standards to informational texts (e.g., “Explain how an author uses reasons and evidence to support particular points in a text”).</td>
<td>Use reading, technology, and/or resources to create written products to demonstrate understanding of GLEs.</td>
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</tr>
<tr>
<td>2. What conclusions can be drawn from similarities between fossil evidence and living organisms? (DOK 1-3)</td>
<td>3. Recognize that different interpretations of evidence are possible. (DOK 1)</td>
<td></td>
<td>Use written notes, readings, and/or technology to create models of fossils and make connections to their environment.</td>
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<tr>
<td>b. Analyze and interpret data to generate evidence about the prehistoric environment. (DOK 1-2)</td>
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<tr>
<td>c. Evaluate whether reasoning and conclusions about given fossils are supported by evidence. (DOK 1-3)</td>
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</tbody>
</table>
# Unit: Connecting to the Past

**Timeline:** 7-9 sessions

**Standard:** Life Science Standard 2

**Grade Level Expectation:** 2. Comparing fossils to each other or to living organisms reveals features of prehistoric environments and provides information about organisms today

**Student Outcomes:**

1. Use evidence to develop a scientific explanation for:
   - What fossils tell us about a prehistoric environment (DOK 1-3)
   - What conclusions can be drawn from similarities between fossil evidence and living organisms (DOK 1-3)

2. Analyze and interpret data to generate evidence about the prehistoric environment (DOK 1-2)

3. Evaluate whether reasoning and conclusions about given fossils are supported by evidence (DOK 1-3)

**Instruction:**

*This standard is not well supported with materials from the Colorado Wildlife kit. See the additional resource below for additional support with teaching this standard.*

**Introduction to paleontology and fossils:**

**KWL:** What do you already know about fossils?

Bill Nye on Fossils: [https://www.youtube.com/watch?v=4NiS4xGOG2A](https://www.youtube.com/watch?v=4NiS4xGOG2A)

**Lesson 1:** Use Fossilworks lesson plan located in the Colorado Wildlife kit.

**Guiding Question:** What are fossils?

**Target:** Fossils tell us about prehistoric plants and animals and their environment.

- **Suggestion:** Play video at the end of lesson [https://www.youtube.com/watch?v=3rkGu0BltKM](https://www.youtube.com/watch?v=3rkGu0BltKM)

**Check for Understanding:** On your own, compare two of the fossils you created with the molds. Identify their environments using the fossil reference guide located in the Fossilworks lesson plan. (Will need to copy for students). This will help reinforce student’s abilities to identify and draw conclusions about the environment the fossils came from.

See Schoology for anticipatory set

**Simulation:** This simulation takes students on an interactive dig, uses tools, and field notes. May be used as an introductory lesson to paleontology.

[http://www.ucmp.berkeley.edu/education/explorations/reslab/newdc/index.html](http://www.ucmp.berkeley.edu/education/explorations/reslab/newdc/index.html)

See link for the teacher guide.

[http://www.ucmp.berkeley.edu/education/explorations/reslab/newdc/m](http://www.ucmp.berkeley.edu/education/explorations/reslab/newdc/m)
Lesson 2: Explore the role of a paleontologist and “dig” for fossils with a partner. Connect your understandings of bones with fossils to draw conclusions about classification. See link below or Schoology: Great Fossil Find activity
http://www.gcsu.edu/nhm/docs/great_fossil_find.pdf
Guiding Question: How do paleontologists classify fossils into groups?
Target: Students will analyze bones and classify them to identify animals as evidence that they once existed in this location.
*Bones and fossils are a type of primary source.
Check for Understanding: Fossil bones are one example of evidence that help paleontologists understand the past environment. What other fossils or evidence can help paleontologists make conclusions about the past environment? (this is an ongoing inquiry question that may be revisited throughout this unit) (Answers may include: shells, molds, casts, trace fossils, plant impressions, sedimentary rocks, amber, frozen, etc.)

Lesson 3: Students will observe and analyze scientific evidence, interpret maps and map symbols, use the evidence to try to reconstruct continents, interpret the evidence to formulate a hypothesis, and defend their position on continental drift. (Students may struggle with vocabulary, says 6th grade but may adapt to 4th)
Guiding Question: How does evidence from the past help us understand the current environment?
Target: Students will analyze fossil evidence to explain how the world has changed.
http://volcanoes.usgs.gov/about/edu/dynamicplanet/wegener/
Simulations: What happens next? Go to teacher start and classroom tools is located on the left for instructional methods.
http://www.ucmp.berkeley.edu/education/explorations/tours/fossil/index.html
Video: How the world has changed. Paleontologists know this based on rock and fossil evidence and the current understanding of how plate tectonics and the world works today.
https://www.youtube.com/watch?v=cQVoSyVu9rk
**Focus Questions:**
How can we use fossils to explain the past environment?
How does evidence help support scientific claims?

**Vocabulary:**
**Academic:** identify, explain, evaluate, justify, analyze, model, evidence, conclusion, defend, interpret, investigate, claim
**Technical:** fossils, variation, characteristics, prehistoric, environment, extinct, nonliving (abiotic) and living (biotic), paleontology,

**Assessments:**
**End of Unit Performance Task:** Pretend you are a paleontologist from the year 52,016. You just discovered a new fossil that dates back to 2016. Create a brochure that identifies the fossil, describes the environment, and helps explain what other animals and plants lived at that location 50,000 years ago.

**Formative Assessment:**
- End of unit test part 3

**Science Resources:**
- Website includes readings, simulated dig game, and information regarding the Age of Reptiles: [http://www.abc.net.au/science/ozfossil/default.htm](http://www.abc.net.au/science/ozfossil/default.htm)
- Higher level fossil museum reading/visuals: [http://www.fossilmuseum.net/fossilrecord/fossilization/fossilization.htm#ichnofossils](http://www.fossilmuseum.net/fossilrecord/fossilization/fossilization.htm#ichnofossils)
- **Visit the Poudre Learning Center.** It has a fossil kit that students can explore, as well as fossil rock slabs for students to observe.

**Literacy Resources:**
# Unit: Interactions and Uniqueness (7-9 sessions)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Life Science Standard 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Competence</td>
<td>Explain and illustrate with examples how living systems interact with the biotic and abiotic environment</td>
</tr>
<tr>
<td>Grade Level Expectation</td>
<td>There is interaction and interdependence between and among living and nonliving components of ecosystems</td>
</tr>
<tr>
<td>Big Idea</td>
<td>There is interaction and interdependence between and among living and nonliving components of ecosystems</td>
</tr>
<tr>
<td>End of unit Performance Task</td>
<td>Identify your local environment, a problem within the environment (examples: flooding, pollution, overpopulation, energy, etc.), and a solution to positively impact the environment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Outcomes</th>
<th><strong>Core Concepts</strong></th>
<th><strong>Nature of Science</strong></th>
<th><strong>Literacy Standards Focus</strong></th>
<th><strong>Writing Standard Focus</strong></th>
<th><strong>Reading/writing Focus</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Use evidence to develop a scientific explanation on how organisms adapt to their habitat. (DOK 1-3)</td>
<td>- An environment is everything that surrounds and influences an organism.</td>
<td>1. Understand that models are developed to explain and predict natural phenomena that cannot be directly observed because they happen over long periods of time. (DOK 1)</td>
<td>RI 4.5 Describe the overall structure (e.g., chronology, comparison, cause/effect, and problem/solution) of events, ideas, concepts, or information in a text or part of a text.</td>
<td>W 4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.</td>
<td>Research multiple sources to create technology-based or written report and presentation to explain a solution to positively impact the local environment.</td>
</tr>
<tr>
<td>b. Identify the components that make a habitat type unique. (DOK 1)</td>
<td>- A habitat is the natural environment of an organism.</td>
<td>2. Evaluate models that show interactions between living and nonliving components of ecosystems, identifying the strengths and weaknesses of the model in representing what happens in the real world. (DOK 2-3)</td>
<td></td>
<td></td>
<td>Use reading, technology, and/or resources to create written products to demonstrate understanding of GLEs.</td>
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<tr>
<td>c. Compare and contrast different habitat types. (DOK 2)</td>
<td>- Every organism has a set of preferred environmental conditions.</td>
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<tr>
<td>d. Create and evaluate models of the flow of nonliving components or resources through an ecosystem. (DOK 2-3)</td>
<td>- A relationship exists between environmental factors and how well the organisms grow.</td>
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<tr>
<td>e. Make a plan to positively impact a local ecosystem. (DOK 2-4)</td>
<td>- An ecosystem is the interactions of organisms with one another and with the nonliving environment.</td>
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<tr>
<td>f. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate endangered habitats. (DOK 1-2)</td>
<td>- Organisms interact in feeding relationships in ecosystems (food chains and food webs).</td>
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<tr>
<td></td>
<td>- Producers make their own food, which is also used by animals (consumers);</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>decomposers eat dead plant and animal materials and recycle the nutrients in the system; organisms may compete for resources in an ecosystem.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adaptations are structures and behaviors of an organism that help it survive and reproduce.</td>
</tr>
<tr>
<td>• Many characteristics of organisms are inherited from the parents; other characteristics result from interaction with the environment.</td>
</tr>
</tbody>
</table>
## Standard: Life Science Standard 2

### Grade Level Expectation: 3. There is interaction and interdependence between and among living and nonliving components of ecosystems

### Student Outcomes:

- 3.a. Use evidence to develop a scientific explanation on how organisms adapt to their habitat (DOK 1-3)
- 3.b. Identify the components that make a habitat type unique (DOK 1)
- 3.c. Compare and contrast different habitat types (DOK 2)
- 3.d. Create and evaluate models of the flow of nonliving components or resources through an ecosystem (DOK 2-3)
- 3.e. Make a plan to positively impact a local ecosystem (DOK 2-4)
- 3.f. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate endangered habitats (DOK 1-2)

### Instruction:

*This standard is not well supported with materials from the kit. See the additional resource below for additional support with teaching this standard.*

The following lessons may be found on Schoology or at:

http://sbsciencematters.com/lesson-units/4th-grade/4life-ecosystems/

### Lesson 1: School Walk Around

**Guiding Question:** What are biotic and abiotic components of the environment?

**Target:** Students establish a foundation of living/nonliving components in an environment.

This lesson takes some preparation. Print out living and nonliving clip art cards.

### Lesson 2: Plot Study

**Guiding Question:** How do different components of the environment interact?

**Target:** Students will learn that biotic and abiotic components interact.

This lesson requires going outside.

**Check for Understanding:** Formative Assessment #1 located on Schoology. May be used after School Walk Around and Plot Study

### Lesson – Food Chain Game:

**Focus Question:** How are organisms in an ecosystem interdependent?


### Additional Activity:

**Overview of Colorado life zones with visual representations (i.e. pyramid)**

Colorado Wildlife teacher’s manual addresses each Life Zone beginning with the Plains (you may want to begin with the ocean so students can conceptualize the idea of above sea level.) These are the main points your students will need to know for each Life Zone:

- Elevation
Focus Questions:
- How do living components of an ecosystem depend on nonliving components?
- How do nonliving components of an ecosystem influence living components?
- Why do ecosystems need to be protected?
- What are biotic and abiotic components of the environment?
- How are organisms in an ecosystem interdependent?
- How do the habitats in various life zones differ?

Vocabulary:
**Academic**:
- identify
- generate
- evidence
- reasoning
- investigate
- study
- interdependence
- interaction

**Technical**:
- environment
- extinct
- ecosystems
- habitat
- nonliving (abiotic) and living (biotic) components

Guiding question(s):
How do the habitats in various life zones differ?
How do living organisms interact with each other and the nonliving components of their ecosystem?

Target(s):
Compare and Contrast organisms within Colorado life zones.
Living components interact supplying each other with food (food web). Living organisms interact with nonliving components to create an ecosystem.

Check for Understanding:
- SCR: A mountain goat has been relocated from the subalpine to the plains. How might this change in habitat affect this animal? Discuss how the animal would have to adapt?
- Create a Venn diagram: Compare/contrast two different life zones. Include living and nonliving components. Page 202 in binder.

Assessments:
**End of Unit Performance Task**: Identify your local environment, a problem within (example: flooding, pollution, energy, etc.), and a solution to positively impact the living and nonliving components. This could be used as a research component, service-learning activity, Poudre Learning Center connection, etc. May be used as a research opportunity.

**Formative Assessment #1**: May be used after School Walk Around and Plot Study

**Formative Assessment**:
- End of unit test part 2

Revised May 2016
• How do living organisms interact with each other and the nonliving components of their ecosystem?

<table>
<thead>
<tr>
<th>Science Resources:</th>
<th>Literacy Resources:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lesson plans specific to Life Science:</td>
<td>• Colorado Wildlife Kit brochures</td>
</tr>
<tr>
<td>• For additional science lesson plans:</td>
<td>Human adaptation: p. 24-29</td>
</tr>
<tr>
<td>• Poudre Learning Center has different habitats that students can investigate:</td>
<td></td>
</tr>
<tr>
<td>prairie, riparian, aquatic, and wetlands. Check with the Center for different</td>
<td></td>
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<tr>
<td>activities that match this standard.</td>
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</tbody>
</table>
### Unit: Solar System

<table>
<thead>
<tr>
<th>Standard</th>
<th>Earth Science Standard 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Competence</td>
<td>Describe and interpret how Earth’s geologic history and place in space are relevant to our understanding of the processes that have shaped our planet</td>
</tr>
<tr>
<td>Grade Level Expectation</td>
<td>1. Earth is part of the solar system, which includes the Sun, Moon, and other bodies that orbit the Sun in predictable patterns that lead to observable paths of objects in the sky as seen from Earth</td>
</tr>
<tr>
<td>Big Idea</td>
<td>Earth is part of the solar system, which includes the Sun, Moon, and other bodies that orbit the Sun in predictable patterns that lead to observable paths of objects in the sky as seen from Earth</td>
</tr>
<tr>
<td>End of unit Performance Task</td>
<td>Individual/classroom model of Solar System and Unit test</td>
</tr>
</tbody>
</table>

#### Student Outcomes

<table>
<thead>
<tr>
<th>Core Concepts</th>
<th>Nature of Science</th>
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<th>Writing Standard Focus</th>
<th>Reading/writing Focus Focus</th>
<th>Cross Content Connection</th>
</tr>
</thead>
</table>
| a. Earth is part of the solar system, which includes the Sun, Moon, and other bodies that orbit the Sun in predictable patterns that lead to observable paths of objects in the sky as seen from Earth. | • Earth and several other planets orbit the Sun and the Moon orbits the Earth.  
• The cyclical change between day and night is the result of a rotating Earth near stationary Sun.  
• Shadows change during the day because the position of the Sun changes in the sky.  
• The Moon can appear in the night or day sky.  
• The Moon is smaller than the Earth and orbits at a distance equal to about 30 Earth diameters.  
• The Moon changes its appearance (phase) in a regular 4-weeks pattern. | 1. Understand that models are developed to explain and predict natural phenomena that cannot be directly observed because they happen over long periods of time. (DOK 1)  
2. Critically evaluate models of the solar system, identifying the strengths and weaknesses of the model in representing what happens in the real solar system. (DOK 2-3) | RI 4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.  
RI 4.10 By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4-5 text complexity band proficiently, with scaffolding as needed at the high end of the range | W 4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. | Research multiple sources to create technology or written report and presentation.  
Use reading, technology, and/or resources to create written products to demonstrate understanding of GLEs.  
Use written notes, readings, and/or technology to create scale model of the Solar System. |
| b. Utilize direct and indirect evidence to investigate the components of the solar system. (DOK 1-2) | | | | | |
| c. Gather, analyze, and interpret data about the Sunrise and Sunset, and Moon movements and phases. (DOK 1-2) | | | | | |
| d. Develop a scientific explanation regarding relationships of the components of the solar system. (DOK 1-3) | | | | | |
- Moon phase is the portion of the illuminated half of the Moon visible from Earth.
- The solar system includes the Sun and the objects that orbit it including Earth, Moon seven other planets, their satellites, asteroids, and comets.
- Gravity keeps the planets and other objects in orbit around the Sun.
- The Sun is an average star and is composed mostly of hydrogen and helium.
### Standard: Earth Science Standard 3

**Grade Level Expectation:** 1. Earth is part of the solar system, which includes the Sun, Moon, and other bodies that orbit the Sun in predictable patterns that lead to observable paths of objects in the sky as seen from Earth.

### Student Outcomes:

1. a. Earth is part of the solar system, which includes the Sun, Moon, and other bodies that orbit the Sun in predictable patterns that lead to observable paths of objects in the sky as seen from Earth.

1. b. Utilize direct and indirect evidence to investigate the components of the solar system (DOK 1-2)

1. c. Gather, analyze, and interpret data about the Sunrise and Sunset, and Moon movements and phases (DOK 1-2)

1. d. Develop a scientific explanation regarding relationships of the components of the solar system (DOK 1-3)

### Instruction:

**Introduction Activity:** Directions to motivational hook that models the creation of our solar system are in Schoology. Use opening activity with the following video: Creation of Solar System/Planet Facts [http://video.nationalgeographic.com/video/101-videos/solar-system-sci](http://video.nationalgeographic.com/video/101-videos/solar-system-sci)

**Activity 1 from Delta Solar System Kit:** Meet Our Solar System (Refer back during Activity 5)

**Resources:** Activity Sheet 1 Part A & B

Extra resource for planet facts: [www.planetsforkids.org](http://www.planetsforkids.org)

Extra reading that can be used throughout the unit: [https://www.nasa.gov/pdf/363296main_Space_Thrills_Poster_Back.pdf](https://www.nasa.gov/pdf/363296main_Space_Thrills_Poster_Back.pdf)

**Guiding Question:** What makes up the solar system?

**Target:** Students will identify components of our Solar System.

*Alternative Lesson to Activity #1:*


Check for understanding: Activity Sheet Part B from Solar System Delta Kit

**Activity 2 & Activity 3 from Delta Solar System Kit:** Earth Orbits the Sun

**Resources:** Activity Sheet 2 & 3

The following link is an interactive video about the topic: [http://www.childrensuniversity.manchester.ac.uk/interactives/science/earthandbeyond/soonmoonearth/](http://www.childrensuniversity.manchester.ac.uk/interactives/science/earthandbeyond/soonmoonearth/)
The following link is a 1 page overview of satellites: [https://www.thetech.org/exhibits/online/satellite/2/2.html](https://www.thetech.org/exhibits/online/satellite/2/2.html)

**Guiding Question:** What is a satellite and how does gravity relate to a satellite’s orbit?

**Target:** A satellite is an object that travels around a larger object in space due to the pull of gravity.

**Check for Understanding:** Sketch the orbit of Earth around the Sun in Science Journals. Emphasize that the student’s diagrams should not be shaped like an oval; the orbit is nearly circular.

**Activity 5 – 8 from Delta Solar System Kit**
Understanding scale size, ratios, and relative sizes as well as distances

**Resources:** Activity Sheet 5, 6a, 7, 8

**Guiding Question:** How big are the planets? What are scale models? How far are they actually from the Sun and Earth?

**Target:** Determine relative and actual sizes of the components of the solar system and the relative and actual distances from Sun and Earth.

**Check for understanding:** SCR – Describe the relationship between sizes and distances of the components of our solar system.

Additional Activities:
- Planet Size Comparison: [http://sciencenetlinks.com/interactives/messenger/psc/PlanetSize.html](http://sciencenetlinks.com/interactives/messenger/psc/PlanetSize.html)

*Alternative Lesson to Activity 5-8 (instead of doing lesson 5-8 teachers may do this lesson):* Teacher provides materials [http://sbsciencematters.com/5th/earth/5.2Size-Distance.pdf](http://sbsciencematters.com/5th/earth/5.2Size-Distance.pdf)

**Planet Research:** (not part of Solar System Kit, but the student books that are included could be used as a starting point)
*Teacher provides materials/planet books
Lesson #3 Planets Pocket Book on the following link:
Activity 9 From Delta Solar System Kit:
Days and Years - What causes the Sunrise and Sunset?

Resources: Activity Sheet 9

Guiding Question: What determines a day and a year on a planet?

Target: The rotation of the planet causes days, and the revolution/orbit around the Sun results in years.

Check for understanding: Compare and contrast revolution (orbit) and rotation. Describe how the earth’s revolution and rotation are different and affect our lives.

Activity: Moon Phases

*There are no resources for moon phases in science kit. There are lessons and activities on Schoology to meet this standard OR follow the lesson plan below:

https://www.ncsmt.org/i3laser_pdfs/Grade4Moon4E119A20DD.pdf

*Teacher provides materials/books

Guiding Question: What are the phases of the moon?

Target: The moon orbits around the earth allowing people to see different portions of the light-up side of the moon.

Supplemental Material:
- Phases of the Moon Video:
  http://www.wonderville.ca/asset/phases-of-the-moon
- Current Moon, Phases video, links, etc.:
  http://teachers.henrico.k12.va.us/staffdev/clough_d/Moon/Phases.html
- Lunar Phase Rotating example:
  http://highered.mheducation.com/olcweb/cgi/pluginpop.cgi?it=swf::800::600::/sites/dl/free/0072482621/78778/Lunar_Nav.swf::Lunar+Phases+Interactive

Check for understanding:
- Identify/label phases of the Moon assessment pages 6 & 7 off the following link:
  https://www.ncsmt.org/i3laser_pdfs/Grade4Moon4E119A2
Focus Questions:

- What makes up the solar system?
- What is a satellite and how does gravity relate to a satellite’s orbit?
- What would happen if the patterns of movement for the Sun and Moon across the sky were different?
- What determines a day and a year on a planet?
- What causes the Sunrise and Sunset?
- How would the solar system change if Earth and other objects did not orbit the Sun?
- Why do we study the solar system?
- How big are the planets? What are scale models? How far are they actually from the Sun and Earth?
- What other satellites orbit the sun besides the planets?
- What is a satellite and how does gravity relate to a satellite’s orbit?
- Why does the moon appear to look different almost every night?
- What are the phases of the moon?
- Why do days and years on different planets vary?

Vocabulary:

- solar system, orbit, revolution, rotate, rotation, axis, space, comets, moon, earth, planets, waning, waxing, quarter, full moon, new moon, star, gravitational attraction, gravity, mass, moon, satellite, asteroid, asteroid belt, meteor, phases, sunrise, sunset, seasons,

Academic Vocabulary:

- hypothesis, identify, describe, data, conclusion, predict, locate information, explain, evaluate, create, develop, justify, analyze, generate, testable question, results, design, model, claim, evidence, reasoning, analyze, interpret, data, components, investigate, relationships, predictable, patterns, scale, relative size average distance

Assessments:

End of Unit Performance Task:
Classroom/hallway scale model of Solar System with fact presentations or individual Solar System Models

End of Unit Assessment:
Earth Science Test

Science Resources:

- www.sbsciencematters.com
- www.planetsforkids.org

Literacy Resources:

- Activity 1: https://www.nasa.gov/pdf/363296main_Space_Thrills_Poster_Back.pdf
- Science Dictionary from Science Kit
- The Moon Seems to Change By Frankyln M. Branley

This is also included in the science packet.


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- http://www.childrensuniversity.manchester.ac.uk/interactives/science/earthandbeyond/soonoonearth/
- The Sun: http://space-facts.com/the-sun/
- Moon phases: http://highered.mheducation.com/olcweb/cgi/pluginpop.cgi?it=swf::800::600::/sites/dl/free/0072482621/78778/Lunar_Nav.swf::Lunar+Phases+Interactive
- * Bill Nye Full Solar System Episode Video (20 min) https://www.youtube.com/watch?v=Q2fWXIA_Nwd0
- Model of Solar System and Planet Facts Video: https://www.youtube.com/watch?v=fXlt315PsBk
- Phases of the Moon Video https://www.youtube.com/watch?v=NCweccNOaqo
- Poudre Learning Center has monthly Astronomy Nights featuring area astronomers with telescopes. Check Poudre Learning Center website for dates and times.
- FOSS - Sun, Moon, and Stars
- The Moon Book by Gail Gibbons
- Phases of the Moon by Gillia M. Olson
- Our Solar System by Seymour Simon
- Destination: Space by Seymour Simon
- The Magic School Bus Lost in the Solar System by Joanna Cole, Bruce Degen
- Magic School Bus Presents: Our Solar System by Tom Jackson