The following instructional plan is part of a GaDOE collection of Unit Frameworks, Performance Tasks, examples of Student Work, and Teacher Commentary. Many more GaDOE approved instructional plans are available by using the Search Standards feature located on GeorgiaStandards.Org.

Georgia Performance Standards Framework for Earth Science – 6th Grade

Unit: Earth, Moon and Sun
Differentiated (Tiered) Task
Positions of Earth, Sun and Moon

Subject Area: Earth Science
Grade: 6th

Standards (Content and Characteristics):

S6E2. Students will understand the effects of the relative positions of the earth, moon, and sun.
   b. Explain the alignment of the earth, moon, and sun during solar and lunar eclipses.

S6CS1. Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.
   a. Understand the importance of—and keep—honest, clear, and accurate records in science.

S6CS2. Students will use standard safety practices for all classroom laboratory and field investigations.
   a. Follow correct procedures for use of scientific apparatus.
   b. Demonstrate appropriate techniques in all laboratory situations.
   c. Follow correct protocol for identifying and reporting safety problems and violations.

S6CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities.
   a. Use appropriate technology to store and retrieve scientific information in topical, alphabetical, numerical, and keyword files, and create simple files.

S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.
   a. Observe and explain how parts are related to other parts in systems such as weather systems, solar systems, and ocean systems including how the output from one part of a system (in the form of material, energy, or information) can become the input to other parts. (For example: El Nino’s effect on weather)
   b. Identify several different models (such as physical replicas, pictures, and analogies) that could be used to represent the same thing, and evaluate their usefulness, taking into account such things as the model’s purpose and complexity.
S6CS6. Students will communicate scientific ideas and activities clearly.
   c. Organize scientific information using appropriate tables, charts, and graphs, and identify relationships they reveal.

S6CS9. Students will investigate the features of the process of scientific inquiry.
   Students will apply the following to inquiry learning practices:
   a. Scientific investigations are conducted for different reasons. They usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations.
   c. Accurate record keeping, data sharing, and replication of results are essential for maintaining an investigator’s credibility with other scientists and society.
   d. Scientists use technology and mathematics to enhance the process of scientific inquiry.

S6CS10. Students will enhance reading in all curriculum areas by:
   a. Reading in All Curriculum Areas
   c. Building vocabulary knowledge
   d. Establishing context

Enduring Understanding:
   • A lunar eclipse occurs when the Moon passes through the Earth’s shadow.
   • A solar eclipse occurs when the Moon passes between the Earth and the Sun.

Essential Question(s):
   • How do lunar and solar eclipses differ? How are lunar and solar eclipses alike?

Pre-Assessment:
   Instruct groups of three students to assign roles to one another (Sun, Earth, and Moon) and to model a lunar and solar eclipse.

<table>
<thead>
<tr>
<th>Outcome/Performance Expectation</th>
<th>BASIC</th>
<th>INTERMEDIATE</th>
<th>ADVANCED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students will draw a diagram of the relative positions of the sun,</td>
<td>Students will position the Sun, Earth, and Moon to demonstrate both a solar and a lunar eclipse.</td>
<td>Students will include the concepts of solar and lunar eclipses in the game.</td>
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<td></td>
<td>earth and moon during a solar and a lunar eclipse.</td>
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</tr>
<tr>
<td>Performance Task: (Detailed Description)</td>
<td>Teacher: Use the websites listed in the resources and/or other text sources to:</td>
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<tr>
<td></td>
<td>1) Explain the positions of the sun, earth, and moon during a solar and lunar eclipse.</td>
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Teacher role?

Georgia Department of Education
Kathy Cox, State Superintendent of Schools
Earth Science • 6th Grade • Earth, Moon and Sun
July 24, 2007 • Page 2 of 5
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### Georgia Performance Standards Framework for Earth Science—6th Grade

<table>
<thead>
<tr>
<th>Student role?</th>
<th>2) Explain that solar and lunar eclipses only happen during specific moon phases.</th>
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<tbody>
<tr>
<td><strong>Student(s):</strong></td>
<td>You may draw, paint, color, and cut out the shapes to construct your diagram or use modeling clay for the following activities:</td>
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</tr>
<tr>
<td><strong>1.</strong> Make one diagram showing a solar eclipse and one showing a lunar eclipse.</td>
<td><strong>2.</strong> Label the diagram (sun, earth, moon, umbra, penumbra, straight line).</td>
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<tr>
<td><strong>3.</strong> Compare the diagrams in Parts I and II. Note that a solar eclipse occurs on a specific moon phase (which one?). Write the name of the moon phase underneath your diagram for the solar eclipse.</td>
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<td><strong>6.</strong> Repeat step #5 for the lunar eclipse.</td>
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<td><strong>Student(s):</strong></td>
<td>Gather common objects of your choice to represent the sun, earth, and moon. You will need 10 spheres (one sun, one earth, and eight moons).</td>
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<td><strong>1.</strong> Demonstrate the position of the sun, earth, and moon during a lunar and a solar eclipse.</td>
<td><strong>2.</strong> Identify the moon phase in the solar and lunar eclipses.</td>
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<td><strong>Student(s):</strong></td>
<td>1. Create a board game using the phases of the moon. You should include the vocabulary words associated with the phases of the moon (1st quarter, full moon, new moon, 3rd quarter, umbra, penumbra, etc.) and their definitions as well as the alignment of the earth, moon, and sun.</td>
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<td><strong>2.</strong> Use index cards, dice, or other materials you would like to make the game interesting for your classmates to play.</td>
<td><strong>3.</strong> Include in the game the concepts of solar and lunar eclipses.</td>
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<tr>
<td><strong>4.</strong> Include the fact that the solar eclipse can only occur during a new moon and that a lunar eclipse can only occur during a full moon.</td>
<td><strong>5.</strong> Game may include diagrams or drawing and moon phases and eclipses.</td>
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<td><strong>6.</strong> Write a set of instructions for your game.</td>
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</table>
Georgia Performance Standards Framework for Earth Science—6th Grade

**Safety Precautions**

1. Bookmark specific websites students can use when doing research. Remind students to hold cutting instruments away from others when working on murals.
2. Students should complete documentation on appropriate internet use as directed by the school system.
3. Preview video prior to showing to students.

**Safety Precautions:**

1. Bookmark specific websites students can use when doing research. Remind students to be cautious when working with hot light bulb.
2. Students should complete documentation on appropriate use of internet as directed by the school system.
3. Preview video prior to showing to students.

**Safety Precautions:**

1. Bookmark specific websites students can use when doing research. Remind students that the dice game should only be tailored to their moon activity.
2. Students should complete documentation on appropriate use of internet as directed by the school system.
3. Preview video prior to showing to students.

**Resources**

- Moon phase animation: [http://www.noao.edu/education/phases/phases_demo.html](http://www.noao.edu/education/phases/phases_demo.html)  
- [http://www.astro.wisc.edu/~dolan/java/MoonPhase.html](http://www.astro.wisc.edu/~dolan/java/MoonPhase.html)


- Diagrams of Solar and Lunar Eclipses and phases of the moon:  
  - [http://www.earthview.com/tutorial/causes.htm](http://www.earthview.com/tutorial/causes.htm)  
  - [http://home.hiwaay.net/~krcool/Astro/moon/moonphase/](http://home.hiwaay.net/~krcool/Astro/moon/moonphase/)

- Short video and photographs of eclipses:  
  - [http://www.space.com/eclipse/](http://www.space.com/eclipse/)  
  - [http://www.mreclipse.com/MrEclipse.html](http://www.mreclipse.com/MrEclipse.html)

**Homework/Extension**

- Choose either the solar or lunar eclipses to write a poem or a Haiku.
- Use electronic resources to find out when the next lunar and solar eclipse will be visible in your town.
- Write a script for a television news anchor who is reporting a lunar or solar eclipse as it is happening.

**Instructional Tasks Accommodations for ELL Students**

- increase % of student talk about topic to help develop prior knowledge
- let ELL students label the phases of the moon, solar and lunar eclipses in their native language and present to class
- highlight key points of information students are to find
- extend the time students have for completing the assignment
- present model/example of work done well at beginning of the assignment
## Instructional Tasks Accommodations for Students with Specific Disabilities

- Provide a peer partner for students with sensory disabilities
- Use amplification equipment or communication aids as appropriate for students who are DHH
- Have students with listening difficulties repeat the task instructions to an adult or a partner
- Use proximity seating during direct instruction or when conveying content information prior to activity
- Gain students’ attention before delivery of content information (ADD, ADHD)

## Instructional Tasks Accommodations for Gifted Students

- Provide a learning center where students can be in charge of own learning
- Ask student’s higher level questions that require them to investigate causes, experiences and facts to draw conclusions or make connections to other areas of learning
- Give gifted students opportunity to design multi-media game to use with the class
- Brainstorm with gifted students about types of projects they would like to explore for extending the classroom learning