



**Marietta City Schools
2023-2024 District Unit Planner**

Second Grade

Topic Title:	<i>Unit #2: The Sun and Moon's Patterns and Effects on Earth</i>	Unit Duration	<i>3 weeks</i>
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Mastering content and skills through KNOWLEDGE-BUILDING (establishing the purpose of the unit):

What enduring understandings will students gain from this unit? The Sun and the Moon's orbits impact their relative appearance and effects on the Earth in predictable patterns.

GSE Standards

Priority ELA

ELAGSE2RI1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

ELAGSE2RI2 Identify the main topic of a multi-paragraph text as well as the focus of specific paragraphs within the text.

ELAGSE2RI3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.

ELAGSE2RI6 Identify the main purpose of a text, including what the author wants to answer, explain, or describe.

ELAGSE2RI7 Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.

Science

S2E1. Obtain, evaluate, and communicate information about stars having different sizes and brightness.

a. Ask questions to describe the physical attributes (size and brightness) of stars.

b. Construct an argument to support the claim that although the sun appears to be the brightest and largest star, it is actually medium in size and brightness.

S2E2. Obtain, evaluate, and communicate information to develop an understanding of the patterns of the sun and the moon and the sun's effect on Earth.

a. Plan and carry out an investigation to determine the effect of the position of the sun in relation to a fixed object on Earth at various times of the day.

b. Design and build a structure that demonstrates how shadows change throughout the day.

c. Represent data in tables and/or graphs of the length of the day and night to recognize the change in seasons.

d. Use data from personal observations to describe, illustrate, and predict how the appearance of the moon changes over time in a pattern. (Clarification statement: Students are not required to know the names of the phases of the moon or understand the tilt of the Earth.)

Essential Questions

Factual—

Where does the light reflected by the Moon come from?

Why does the Moon appear to change shape?

How does the Moon affect tides on Earth?

Inferential—

Why did people use myths and legends to explain the Moon?

Why does the Moon appear larger than the stars at night?

Critical Thinking-

What would change on Earth if there was no Moon?

Why does the Moon orbit the Earth instead of orbiting the Sun?

Tier II Words- High Frequency Multiple Meaning

phase, sliver, diameter, reflect

Tier III Words- Subject/ Content Related Words

waning, eclipse, lunar, orbit

Assessments

Transfer of Integrated Skills:

- Illustrating the Missing Moons: Adapt the Moon Phase Calendar (p. 24) provided in GADOE resources by whiting out or otherwise removing the images for May 11, May 20, May 26, June 4.
 1. Have students use books and other resources from this unit to independently draw what the moon should look like on each of the missing days. Scaffold as needed by providing students who need them with Moon Phase Cards (p. 34) to sort rather than create from scratch.
 2. Pair students up to compare and explain their drawings using language related to this unit and sentence stems:
 - a. *I drew ___ because on ___ we would see ___.*
 - b. *I know because the day before it shows ___ and the day after it shows ___.*

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ELAGSE2RI7 Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.

- Learning About the Sun adapted from ReadWorks passage
 1. Provide each student with a copy of the passage
 2. Display or print out the following open-ended prompts: *How does the age of the Moon help scientists know the age of the Sun?*
What are two things that will change about the Sun as it gets older?
How will those changes affect life on Earth?

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ELAGSE2RI3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.

Content-Specific GSE/Skills:

- S2E2 Anticipation Guide
- S2E2 Summative Assessment

Writing Task and Rubric:

- Compare and Contrast Eclipses

Provide students with a copy of [Comparing Paper](#) and their own copy of the Moon Phases Quiz from the Summative Task.

1. Divide the illustration box in half and use the directions for #4 and #5 to collaboratively create diagrams for solar and lunar eclipse in each half.
2. Once students have completed their own diagrams, assign the the task of comparing and contrasting the two eclipses in their own words.
3. The final writing should include at least one similarity and one way each eclipse is unique.

ELAGSE2W5: With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.
 ELAGSE2RI3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
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Similarity	Includes multiple accurate similarities	Includes an accurate similarity that relates specifically to eclipses (Something blocks the light.)	Includes an accurate but general similarity (There is a sun.)	Does not include an accurate similarity
Difference	Includes more than one way each eclipse is different from the other (more than two statements)	Includes one way each eclipse is different from the other (two statements)	Includes one way one eclipse is different from the other (one statement)	Does not include any ways that the eclipses are different
Coherence		Explanation explicitly refers to eclipse diagrams	Explanation aligns with eclipse diagrams	Explanation does not align with eclipse diagrams

Objective or Content	Learning Experiences	Differentiation Considerations
Daily Lessons for Text Comprehension	<i>15-Day Plan: The Sun and Moon's Patterns and Effects on Earth</i>	
Connected Science Experiences	<p><i>Exploration I</i> In this activity, students will model the phases of the moon by drawing what they observe at the same time each night for approximately one month. They will develop an understanding of how the moon appears to change during each phase.</p> <p>Suggested Materials Per student:</p> <ul style="list-style-type: none"> • A place to see the moon • A notebook (unlined – small is better) • Pencils or crayons 	

- A ruler

To introduce the activity, provide time for students to understand that the moon is always round, but we see it differently every night. Sometimes, we see only the right half of the moon. At other times, we may see the whole moon. Point out that students should draw what the moon looks like every night for about a month. Remind students that their flip books will work better if their drawings are in the same place on each page. Suggest that students make a mark on each page of the book where they want to place their drawing. The best way to do that is to make a small dot to show the middle of their paper at the bottom of each page.

Part 1: Observation

Create a flipbook to show students what they are and how they can be used to show something that changes or moves. Introduce the concept of using a reference point, such as a dot halfway across the page at the bottom of each sheet. This will help them place the image of the moon and create a better flipbook. Show students your flipbook and provide a brief description of how you made your own small movie.

Divide students into small groups and allow them time to design their flipbooks. Groups should consider what materials they will need to complete a flipbook and the best way to complete the project. Allow students time to plan their flipbooks, then provide the following basic steps to help fill in any gaps.

1. Create the flipbook by getting a new pad of paper. The best kind would be something that does not have any lines.
 2. Inform students that since their drawings will be of the moon, they do not need a large flipbook. The best flipbook would be something smaller like a post-it pad or index cards stapled together.
 3. If their flipbook is not already put together, it would be important to write the date of each drawing somewhere on the page. That will help them put the book together later.
 4. Measure each page to find out where the half point is for each page. Make a small mark to show where they should draw the moon.
 5. Complete the drawings each night to show what the moon looks like.
 6. After completing all drawings, place them in order and staple the book together (if needed).
 7. Quickly flip through the book to watch how the moon changes its shape.
- You may wish to have students predict how their drawings may be different.

Part 2:

Communicating

1. How were your drawings the same? Students should note that each drawing is based on their observation of the moon's appearance.

2. How were your drawings different? Students should note that the moon changes its shape in each drawing.
3. What patterns did you notice? Students should note that there is a pattern of how the moon changes its shape. The reflection from the sun hits different parts of the moon as it moves around Earth. This is why the moon looks like it has a different shape at night. The moon does not really change its shape.

Evaluating

During a final discussion in class, ask students to describe what they observed while creating their flipbooks. Ask students to consider why it looks like the moon changes its shape. Ask students if the moon really does change its shape. To further the discussion, ask students if they can explain how and why the reflection of the sun determines how the moon looks. You can also ask students how long it takes the moon to go through an entire change (all phases).

Exploration II

In this activity, students will utilize scientific investigation and reasoning to gain understanding about the phases of the moon. Specifically, students will work in groups with tools to collect and record data that helps explain the reasons the moon changes in appearance at various points in its cycle, due to its position with respect to Earth and the sun. In addition, students will conduct research on computers to compare their own empirical data to secondary sources found on the internet.

Materials:

Pencils or dowels

Foam balls

Lamp without a shade

Dark room

Paper

Markers

Computers

Divide students into groups. Have one student on each team volunteer to be the Earth, and have one student on each team volunteer to be the record keeper. Stick pencils or dowels into the foam balls. Darken the room, and turn on the lamp. Put the lamp at eye level in the middle of the room. Now have the Earth students face the lamp. Explain that the lamp is the sun, the student is the Earth, and the ball is the moon.

Have the students hold the balls at arm's length, directly facing the lamp. Students can experiment with how high or how low they hold the balls. As viewed from Earth, the moon usually appears above or below the sun. The side of the

	<p>ball facing the Earth is dark. Ask the rest of the group what phase of the moon this is. (New moon.). Have the record keepers sketch the arrangement of the “sun,” “moon,” and “Earth,” along with what the moon looks like from “Earth”. The other students should confirm that the sketches are accurate.</p> <p>Have the students turn slowly 90 degrees counterclockwise while they hold the balls at arm's length so the light can always reach it. Have the rest of the group watch the ball, and observe how much of the lighted side of the moon is visible from “Earth.” Again, the record keeper should record the arrangement and the view of the moon from Earth. Repeat this process three more times, turning 90 degrees each time. (You may also have students repeat the observations turning 45 degrees for each observation.)</p> <p>(NOTE: The same side of the moon does always face the Earth, but the moon does not actually orbit Earth at the same rate that Earth rotates. If appropriate for your class, you may use this fact to discuss the similarities and differences between models and real life.)</p> <p>After students have made observations about each of the four main phases, have students use computers to conduct research on the various phases of the moon. They should refer to the record keeper’s drawings in order to match the images of the moon to the names for each phase (new moon, first quarter, full moon, last quarter, etc.). Students should record each phase, with its corresponding label, until a full cycle has been completed and all moon phases have been recorded.</p> <p>Communicating Finally, discuss what the model shows and what causes the different phases of the moon. Encourage students to back up any claims with evidence from the activity and from their research, along with logical reasoning.</p>	
<p>Connected Tier 1 Unit</p>	<p>CKLA: Sun, Moon, and Stars</p>	
<p>Connected Writing Activities</p>	<p>Focus skill: Sentence creation</p> <ul style="list-style-type: none"> • Topic Verb Finish (TVF) 	
<p>Suggested High Quality Complex Texts and Experiential Resources</p>		

