

## LESSON PLAN

**Subject:** Grade 4 Science

**Lesson:** All the Time in the World

**Standards Addressed:**

- Explain the causes of day and night and phases of the moon (NC.4.E.1)

**Objectives:**

- Students will be able to discuss the way Earth's rotation on its axis causes day and night. Students will also be able to diagram the monthly changes in the appearance of the moon, based on the moon's orbit around the Earth.
- Students will know that the moon rotates and revolves around the Earth, and there are visible patterns of the moon called phases.

**Materials Needed:**

- Device for showing *All the Time in the World* video
- “Faces of the Moon” Activities
- Colored pencils

**Outline:**

- Prior to this lesson students should understand:
  - The Sun and moon in relation to Earth
  - Pattern of day & night
  - Phases of the moon
- Before the video, have students look over the 2 activities and review some of what you have learned about the Earth, sun and the phases of the moon.
- Play the 6-minute video, “All the Time in the World.” <https://youtu.be/LrSoSo5kr5k>
- After the video, students may complete the activity sheets individually.

**Take It Further:** Go to <https://www.scientificamerican.com/article/its-about-time-to-make-a-sundial/#:~:text=Take%20your%20plate%20and%20plastic,with%20the%20line%20you%20drew>. Make and observe a sundial with the students. Note that the shadows grow, shrink and change direction, just at the shadows on the moon during phase changes.

**Cross-Curriculum Connection:** Below are links to two songs about the moon and its phases. Have the students listen to both and have the class vote on a tune to a popular song. Then work together to make lyrics about the phases of the moon to that tune. (Hey that rhymes!)

<https://youtu.be/ampmr29DeRY>

<https://youtu.be/79M2ISVziY4>



## ALL THE TIME IN THE WORLD

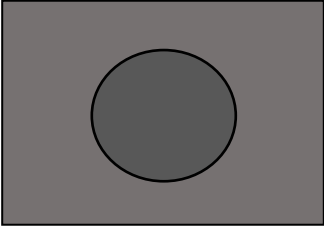
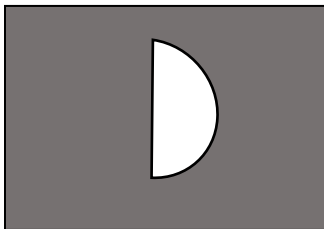
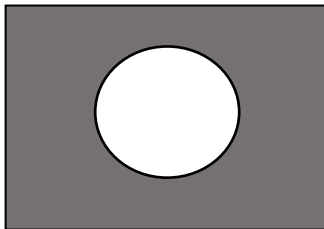
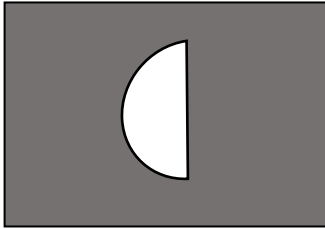
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Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Activity 1:** Sister Lancaster loves to watch the moon each night. She has drawn all the shapes she has seen this month in her journal.

Day 1	Day 7	Day 14	Day 21
			

Fill in the blanks with the correct words from the Word Box below.

<b>Third Quarter</b>	<b>Waning</b>	<b>Full Moon</b>
<b>Waxing</b>	<b>First Quarter</b>	<b>New Moon</b>

On Day 1, Sister Lancaster could not see the moon. The moon was in the \_\_\_\_\_ phase. On Day 7, Sister Lancaster could see one half of the moon. The light of the moon was on the right side. The moon was in the \_\_\_\_\_ phase. On Day 14, Sister Lancaster could see an entire circle of brightness. The moon was in the \_\_\_\_\_ phase. On Day 21, Sister Lancaster could see only one half of the moon. This time, the light of the moon was on the left side. The moon was in the \_\_\_\_\_ phase. The light of the moon grew from Day 1 to Day 14. We call this \_\_\_\_\_. The light of the moon got smaller from Day 14 to Day 21. We call this \_\_\_\_\_.

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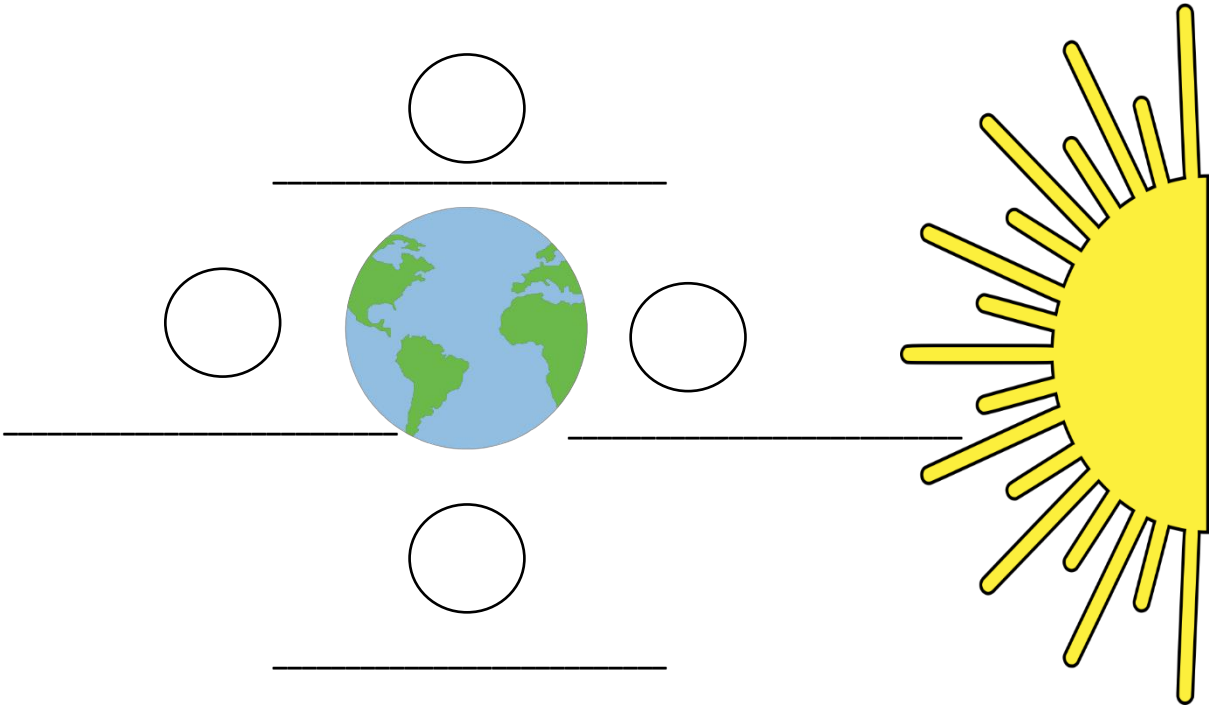
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**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Activity 2:** Help Sister Lancaster determine the positions of the Earth, Sun, and Moon during different moon phases.

*Label the moon phases on the picture below.*



**Activity 3:** Sister Lancaster wonders why it gets dark at night.

*Using the words axis, Earth, sun, and light, explain why it is dark at night.*

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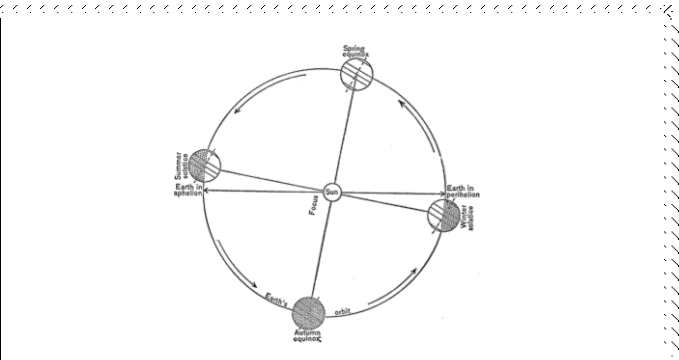
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Date: \_\_\_\_\_

**Activity 4:** There was a time when people did not know about the Solar system. By the 1800s in Salem, they knew most of what you now know. Choose the best answer for each multiple-choice question.

1. What is the center of our Solar system?

- a. Earth
- b. The moon
- c. You
- d. The sun
- e. Asteroids

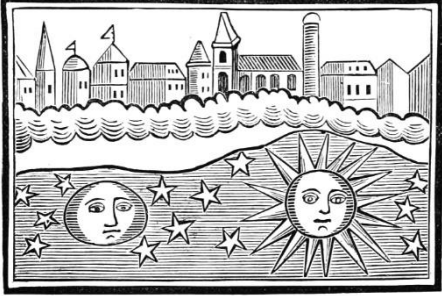


2. How long does it take the Earth to rotate once on its axis?

- a. One hour
- b. One season
- c. One year
- d. 24 hours
- e. 7 years

3. What would you find on the surface of the moon?

- a. Forests
- b. Craters
- c. Oceans
- d. Blue cheese
- e. Glaciers



4. How long does it take to Earth to orbit the sun?

- a. It does not orbit the sun
- b. One hour
- c. One day
- d. One year
- e. One season



## ALL THE TIME IN THE WORLD

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### Answer Key

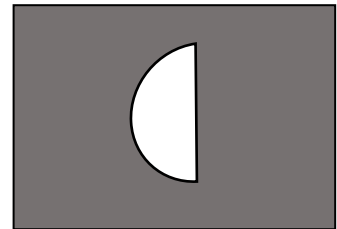
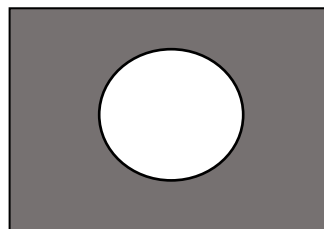
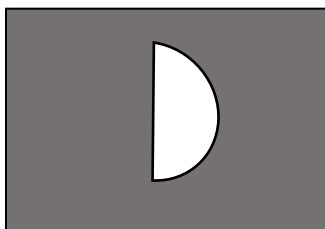
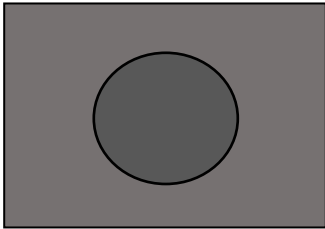
**Activity 1:** Sister Lancaster loves to watch the moon each night. She has drawn all the shapes she has seen this month in her journal.

Day 1

Day 7

Day 14

Day 21



Fill in the blanks with the correct words from the Word Box below.

<b>Third Quarter</b>	<b>Waning</b>	<b>Full Moon</b>
<b>Waxing</b>	<b>First Quarter</b>	<b>New Moon</b>

On Day 1, Sister Lancaster could not see the moon. The moon was in the **New Moon** \_\_\_\_\_ phase. On Day 7, Sister Lancaster could see one half of the moon. The light of the moon was on the right side. The moon was in the **First Quarter** \_\_\_\_\_ phase. On Day 14, Sister Lancaster could see an entire circle of brightness. The moon was in the **Full Moon** \_\_\_\_\_ phase. On Day 21, Sister Lancaster could see only one half of the moon. This time, the light of the moon was on the left side. The moon was in the **Third Quarter** \_\_\_\_\_ phase. The light of the moon grew from Day 1 to Day 14. We call this **Waxing**. The light of the moon got smaller from Day 14 to Day 21. We call this **Waning**.

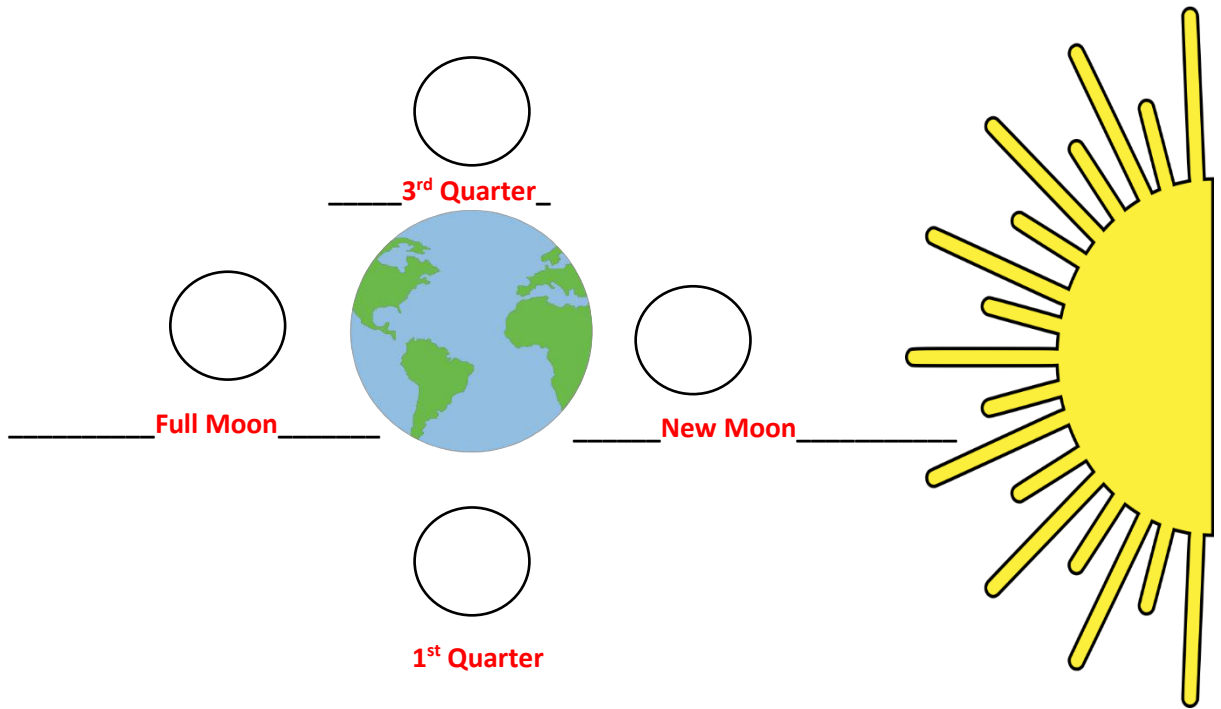
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### Answer Key

**Activity 2:** Help Sister Lancaster determine the positions of the Earth, Sun, and Moon during different moon phases.

*Label the moon phases on the picture below.*



**Activity 3:** Sister Lancaster wonders why it gets dark at night.

Using the words axis, Earth, sun, and light, explain why it is dark at night.

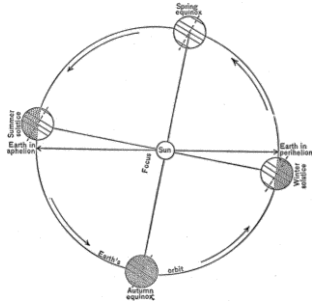
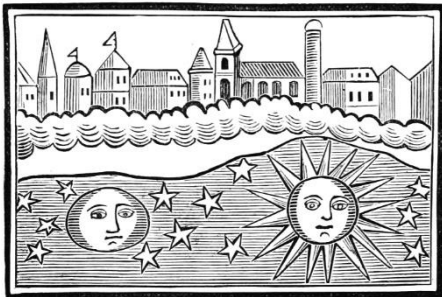
\_\_\_\_\_ As the Earth turns on it's axis, the part that is turned away from the sun \_\_\_\_\_  
 \_\_\_\_\_ becomes dark (night) and the part facing the sun is light (day) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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### Answer Key

**Activity 4:** There was a time when people did not know about the Solar system. By the 1800s in Salem, they knew most of what you now know. Choose the best answer for each multiple-choice question.

<p>1. What is the center of our Solar system?</p> <ul style="list-style-type: none"> <li>a. Earth</li> <li>b. The moon</li> <li>c. You</li> <li style="color: red;">d. The sun</li> <li>e. Asteroids</li> </ul>	
<p>2. How long does it take the Earth to rotate once on its axis?</p> <ul style="list-style-type: none"> <li>a. One hour</li> <li>b. One season</li> <li>c. One year</li> <li style="color: red;">d. 24 hours</li> <li>e. 7 years</li> </ul>	<p>3. What would you find on the surface of the moon?</p> <ul style="list-style-type: none"> <li>a. Forests</li> <li style="color: red;">b. Craters</li> <li>c. Oceans</li> <li>d. Blue cheese</li> <li>e. Glaciers</li> </ul>
	<p>4. How long does it take to Earth to orbit the sun?</p> <ul style="list-style-type: none"> <li>a. It does not orbit the sun</li> <li>b. One hour</li> <li>c. One day</li> <li style="color: red;">d. One year</li> <li>e. One season</li> </ul>