

Learning Objective: Lunar Phases
NGSS Standard DCI: MS.ESS1.A-1

Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models.

Objective:

Students will be able to:

1. Name the phases of the moon and identify them based on a model.
2. Identify which phase of the moon occurs in various locations in its orbit around Earth.
3. Describe why only one side of the moon is visible from Earth.

Time Required: 65 minutes

Materials Needed:

- Teacher with computer/internet access
- 1 computer/laptop/iPad per student with internet access
- Styrofoam cups (9 per group)
- Black marker
- Blue marker
- Phases of the Moon Worksheet

Teacher Preparation:

- Create Playlist 1, a 30 minute playlist, in [Legends of Learning](#) with the following game found in Lunar Phases
 - Lunar Wolves
 - Ms. Rose and Lunar Phases
- Create Playlist 2, a 10-minute playlist in Legends of Learning with 5 [assessment questions](#) from the Lunar Phases learning objective
- Prepare 9 styrofoam cups (1 set of 9 per group) by coloring in the bottoms to represent the lunar phases. Use the blue marker to completely color the bottom of the ninth cup to represent the Earth
- Make copies of the Phases of the Moon Worksheet for each student

Engage (5 minutes):

1. Students are divided into groups of 4-5. Each group is given a set of 9 cups. The bottoms of the cups are shaded with marker to represent the various lunar phases. The blue cup is the Earth.
2. Groups are instructed to place the blue cup in the center (bottom up) and surround the "Earth" with the cups showing the lunar phases in what they think is the correct order.
3. Students will keep their model on their table to be revisited later after playing the games.

Explore (30 minutes):

1. Hand out the Phases of the Moon Worksheet to each student.

2. Have students sign into [Legends of Learning](#) and enter your teacher code.
3. [Launch](#) Playlist 1 to the students.
4. Pass out the Phases of the Moon Worksheet.
5. While students are working through this game they will complete the worksheet.

Explain (15 minutes):

1. Students will get back together in their groups from the Engage activity and re-arrange their phases of the moon model based on the new knowledge they have gained.
2. Teacher will check that each group has an accurate model prior to moving on.
3. Teacher will review the answers to the Phases of the Moon Worksheet by drawing diagrams on the board. Teacher will ask students to come to the board and shade in what the moon looks like for each of the phases.

Elaborate (5 minutes):

1. Explain to students that no matter when we look at the moon, we are always seeing the same side of the moon. On Earth, we never see “the dark side” of the moon.
2. Show this video to students to help them understand the reason why:
<https://www.youtube.com/watch?v=6jUpX7J7ySo>
3. Ask students: How do we know what is on the other side of the moon? (**Answer: Satellites have been sent to take pictures of the other side of the moon so we know what it looks like.**)

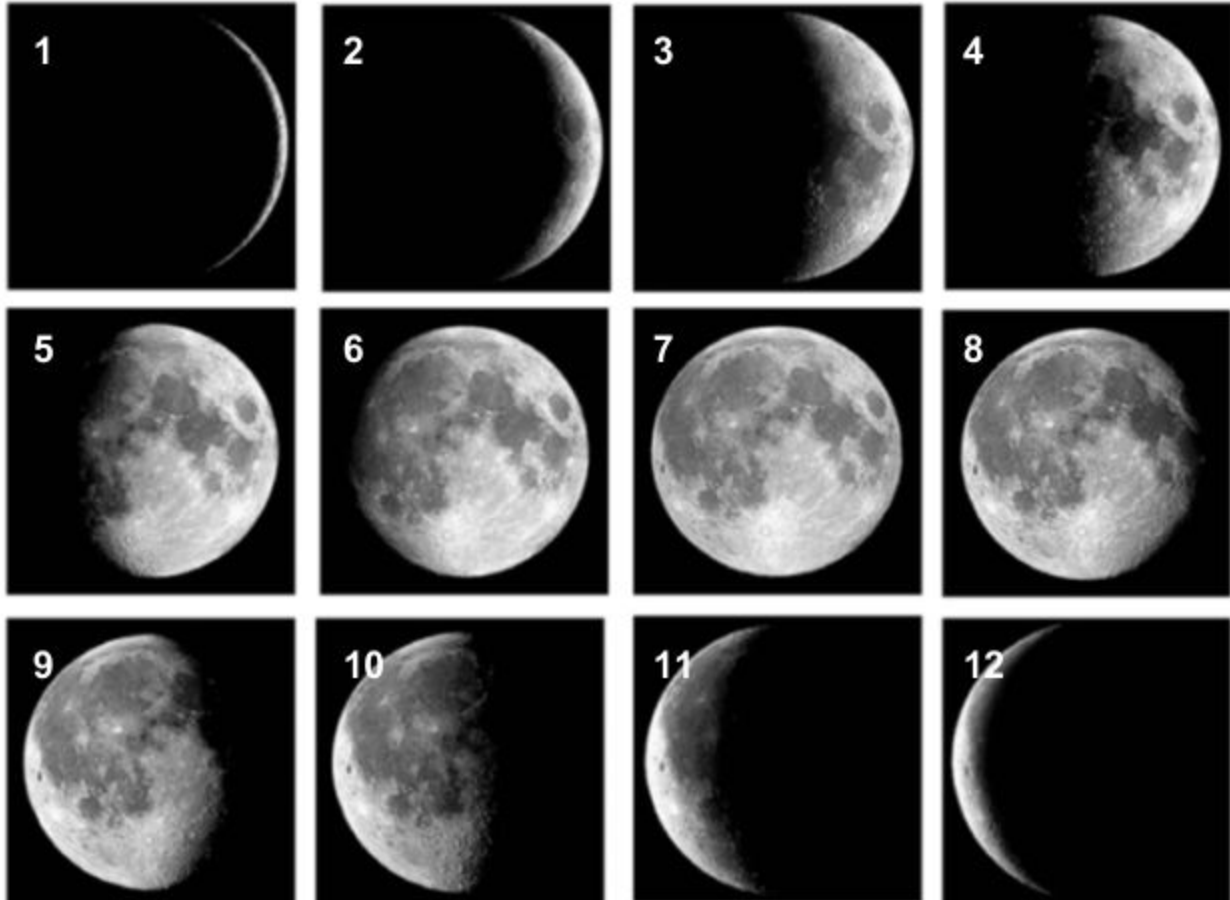
Evaluate (10 minutes):

1. [Launch](#) Playlist 2 to your students. When they finish the assessment questions, any time left is freeplay.
2. [Analyze student results](#) to determine what concepts need to be a focus for reteaching.

Name: _____

Date: _____

Phases of the Moon



Directions: Using the pictures above, complete the worksheet.

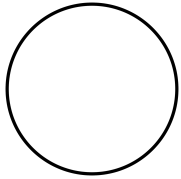
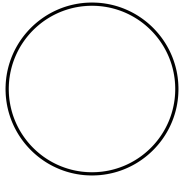
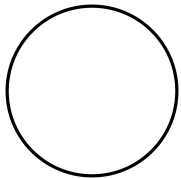
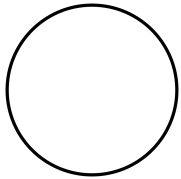
Which image shows First Quarter? ____ Full? ____ Third Quarter? ____

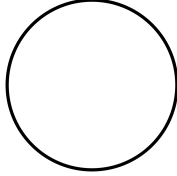
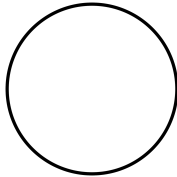
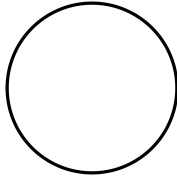
Which images are crescents? _____ Gibbous? _____

Which images are waxing? ____ through ____

Which images are waning? ____ through ____

Directions: Using the description and matching words, complete worksheet by adding the drawing of that phase of the moon.

<p>1. New Moon Moon is almost directly between the sun and Earth (start of cycle).</p>	
<p>2. Waxing Crescent Moon A bit of the sunlit side of the moon shows on the right side.</p>	
<p>3. First Quarter Moon The moon is a quarter of its way around Earth. It is in its first quarter phase.</p>	
<p>4. Waxing Gibbous Moon The moon is increasing in light between a first quarter moon and a full moon.</p>	

<p>5. Full Moon Two weeks have passed since the new moon. We see the entire face of the moon shining.</p>	
<p>6. Waning Gibbous Moon The moon is decreasing in light between a full moon and a last quarter moon.</p>	
<p>7. Last Quarter Moon The moon is three-quarters of its way around Earth. It is in its last quarter phase.</p>	
<p>8. Waning Crescent Moon A bit of the waning sunlit side of the moon shows on the left side.</p>	