



It's Just a Phase!

Phases of the Moon and the Effects on Earth



Mandy Keys, Brittany Bowens, Nicole Harris

Published by K20 Center

This work is licensed under a [Creative Commons CC BY-SA 4.0 License](https://creativecommons.org/licenses/by-sa/4.0/)

Grade Level 8th Grade

Time Frame 115 minutes

Subject Science

Duration 2-3 class periods

Essential Question

Why does the moon look different every night if it's the same moon?

Summary

This lesson explores why the moon appears to change shape while it orbits Earth and why moon phases occur. Students have the opportunity to make observations, create a hands-on moon model to explore the different moon phases, and participate in discussions about the eight phases of the moon. Students also explore a real-life application of the content by watching a video interview with a NASA aeronautical engineer that oversaw the landing of the Sojourner rover on the surface of Mars. To summarize their learning, students participate in a review game that allows them to apply and demonstrate their knowledge of moon phases.

Snapshot

Engage

Students analyze different images of the moon using the I Notice, I Wonder instructional strategy.

Explore

Students create a wheel diagram showing the different phases of the moon. Then, they participate in a hands-on learning activity using a pencil, styrofoam ball, and table lamp to demonstrate the phase of the moon they see pictured.

Explain

Students watch a video and reflect on different characteristics of the moon and moon phases.

Extend

Students watch a career exploration video featuring the manager for the Mars Exploration Program for NASA and answer questions about the video.

Evaluate

Students work together in groups to play a trivia game to reflect on their learning.

Standards

ACT College and Career Readiness Standards - Science (6-12)

IOD403: Translate information into a table, graph, or diagram

EMI201: Find basic information in a model (conceptual)

Oklahoma Academic Standards for Science (Grade 8)

8.ESS1.2: Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

Attachments

- [Boards Up Question Responses—It's Just a Phase.docx](#)
- [Boards Up Question Responses—It's Just a Phase.pdf](#)
- [I Notice, I Wonder—It's Just a Phase.docx](#)
- [I Notice, I Wonder—It's Just a Phase.pdf](#)
- [Lesson Slides—It's Just a Phase.pptx](#)
- [Moon Phases Wheel—It's Just a Phase.docx](#)
- [Moon Phases Wheel—It's Just a Phase.pdf](#)
- [Video Reflection—It's Just a Phase.docx](#)
- [Video Reflection—It's Just a Phase.pdf](#)

Materials

- Lesson Slides (attached)
- I Notice, I Wonder handout (attached; one per student)
- Video Reflection handout (attached; one per student)
- Moon Phases Wheel handout (attached; one per student)
- Boards Up Question Responses document (attached)
- Brads
- Table lamp without a shade (one per class)
- Sharpened, wooden pencils (one per student)
- Styrofoam ball (one per student)
- Whiteboards (one per group)
- Dry erase markers (one per group)
- Erasers (one per group)

10 minutes

Engage

Use the attached **Lesson Slides** to guide the lesson. Begin with **slide 3** and briefly read aloud the essential question: “Why does the moon look different every night if it’s the same moon?” Then, move to **slide 4** and review the learning objectives.

Pose the question to the class, “Have you ever looked up at the night sky? What do you see?”

Pass out the attached **I Notice, I Wonder** handout and display **slide 5**. Review the [I Notice, I Wonder](#) instructional strategy with students. Ask them to first review the images displayed, and then write down three things they notice in the left column and two things the images make them wonder about in the right column.

Once students have completed the activity, have them discuss their responses with their neighbors and add more ideas to their papers. Then, have students come back together as a whole class. Ask students to share out what they discovered and ask them if the moon is always the same.

45 minutes

Explore

Pass out the attached **Moon Phases Wheel** handout and brads. Use **slides 6–7** to guide students in preparing and filling out their Moon Phases Wheels.

Teacher's Note: Providing an Example

Consider guiding students through the process of completing the first phase of the Moon Phases Wheel.

After students are finished with their wheels, place the table lamp (or other light source) in the middle of the room. Give each student a sharpened pencil and a styrofoam ball. Have students poke the tip of the sharpened pencil into the styrofoam ball to create a model of the moon. Tell students that the table lamp will represent the sun, each of their styrofoam balls will represent the moon, and each of their heads will represent the Earth.

Have students stand in a circle around the table lamp holding the pencil end of their moon models in one hand. Direct students to extend their moon models in front of their bodies, parallel to their eyes. Have them draw the “moon phase” depicted on their sphere in the “Viewing Window” section on Circle B of their Moon Phases Wheels. Have them label the phase and write a short description.

Next, have students keep their arms extended and turn their bodies counterclockwise about 45 degrees. Have them observe what they now see on their spheres and draw what they see on the next section of their Moon Phases Wheels. Have them also label the phase and write a description. Repeat this process having students rotate 45 degrees each time, observe their sphere, draw what they see, and describe the phase. Continue this process multiple times in the same counterclockwise direction so students are able to observe all eight phases of the moon on their models. When all rotations are complete, students should observe the same moon phase on their model as they did when they started.

20 minutes

Explain

After students have completed their wheel, have them return to their seats. Move to **slide 8** and share information about the phases.

Invite students to share out the descriptions they wrote about their initial drawings. Then, display **slide 9** and share information about the new moon. Have students review their descriptions on their wheels and update them if needed. Repeat this process for the remaining phases using **slides 10–16**.

Display **slide 17** and pass out the attached **Video Reflection** handout. Explain to students that they will watch the video and complete the top portion of the handout using the moon phases and related vocabulary. Specify that students should only complete the first three questions, reproduced below:

1. What is the difference between waxing and waning?
2. How long does the moon orbit around Earth?
3. Why do you think it's important to understand the phases of the moon?

Play the video [Phases of the Moon: Astronomy and Space for Kids](#) on the slide.

After students watch the video and respond to the questions, have them find an [Elbow Partner](#) and compare their answers. Then, facilitate a whole-class discussion about the questions.

20 minutes

Extend

Move to **slide 18** and inform students: "Today, we are going to learn about a profession that involves a career in the field of astronomy. We are going to meet Ms. Donna Shirley, an aeronautical engineer."

Ask students to read the questions under the "Aeronautical Engineer" heading on their Video Reflection handouts to prepare for the video. Play the video on the slide, [*K20 Career-Focused: Aeronautical Engineering with Donna Shirley*](#).

After the video, facilitate a whole class discussion by reviewing the questions on the Video Reflection handout.

20 minutes

Evaluate

Move to **slide 19**. Organize students into groups of 4–5 and give each group a whiteboard, marker, and eraser.

Review the [Boards Up](#) instructional strategy. Share that students should stand in a line with their groups. Explain that the first person of each line will answer the given question on their whiteboard within 15 seconds on their own. When time is up, call “Boards up!” Review students’ responses on the boards and give a point to each team that got the correct answer. Have students wipe the boards clean, pass them to the next student in their lines, and move to the back of the line. The next student in line should move up to answer the next question.

Teacher's Note: Teacher Guide

The answers to the trivia questions in this activity are included in the attached **Boards Up Question Responses** document.

Set a timer for each question using the [K20 Center's timer](#). Repeat the same steps using the questions on **slides 20–39**. Keep playing until all questions have been answered.

Display the bonus question on **slide 40**. Share the current phase of the moon using [NASA's Daily Moon Guide](#).

Tally up the points scored by each group. The team with the most points wins.

Resources

- Free School. (2016, February 5). *Phases of the moon: Astronomy and space for kids* [Video]. YouTube. <https://www.youtube.com/watch?v=f4ZHdzl6ZWg>
- K20 Center (n.d.). Boards up. Strategies. <https://learn.k20center.ou.edu/strategy/5243>
- K20 Center. (n.d.). Elbow partners. Strategies. <https://learn.k20center.ou.edu/strategy/116>
- K20 Center. (n.d.). I notice, I wonder. Strategies. <https://learn.k20center.ou.edu/strategy/180>
- K20 Center. (2025, June 4). *K20 ICAP – Aeronautical engineer for NASA* [Video]. YouTube. <https://www.youtube.com/watch?v=rYT3JoJDh9E>
- National Aeronautics and Space Administration. (n.d.). *Daily moon guide*. <https://science.nasa.gov/moon/daily-moon-guide/>