



Phases of the Moon

Prep Time: 10 minutes	Grades: 4-8	Lesson Time: 55-60 minutes
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Essential Questions:

What are the phases of the moon?

What do the phases of the moon look like?

Objectives:

SWBAT model the phases of the Moon.

SWBAT give a visual representation of each phases and their order.

Standards:

MS-ESS1-1. Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

RST.6-8.7 - Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Teacher Prep:

Materials: device with access to the internet, clear plastic cups (16 oz.), black permanent markers, black construction paper, yellow construction paper, scissors, glue.

Each student needs 2 plastic cups.

Teacher Notes/Background:

This lesson was adapted from [Happy Tot Shelf's Phases of the Moon Learning Toy](#).

Phases of the Moon: New Moon, Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Waning Gibbous, Last Quarter, Waning Crescent.

Phase: how much sunlight reflects off the moon.

Phase cycle repeats every 29 days.

Gibbous: more than $\frac{1}{2}$ of the moon is visible

Phases of the Moon

Engage (5 minutes)	<p>Mix and Match:</p> <p>Distribute a set of cards to small groups of students (max 2-3 per group) and have them match the phase to the picture.</p> <p>After they have matched them, have the students put the phases in order starting with a New Moon.</p> <p>Students can time themselves to see how quickly they can put the cards in order after mixing them up.</p> <p>They should keep these cards matched up, as they will help during the activity.</p>	<p>Materials:</p> <p>Attached cards Timer</p>
Explore (5 minutes)	<p>Recap:</p> <p>Briefly recap main ideas from the Moon video about the cycle of the phases of the Moon.</p> <p>Explore the model of the Moon briefly with the attached link in the Materials section. It lists human landing sites, robotic landing sites, and some geography of the Moon. It also lists the current phase and time until the next full Moon.</p>	<p>Materials:</p> <p>https://moon.nasa.gov</p>

Phases of the Moon

Construct a Model:

The materials listed are necessary per individual student. Gather the appropriate materials to begin constructing the model.

The piece of black construction paper will go around the inside of one of the plastic cups. Measure it by fitting it inside the cup so that the entire inside is covered with the paper. Once this is done, cut and tape/glue the paper accordingly.



Using the yellow construction paper, cut out a circle that is slightly larger than a quarter. It will be used in the next step.

Stack the two plastic cups with the one with construction paper inside of the other cup. Find a spot to paste the yellow circle so that it is clearly visible, about halfway up the cup. Once you find a spot, glue the circle to the outside of the inner cup with the black or white construction paper.



Materials:

2 large clear plastic cups
Black permanent marker
Yellow construction paper
Black or white construction paper
Tape
Glue
Scissors

Explain
(30 minutes)

Stack the cups. Make sure you can see your circle clearly. Using the permanent marker, underneath the full yellow circle write "Full

Phases of the Moon

Moon” and trace the outline of the yellow circle. This is what the Moon looks like on Earth.



Turn the inside cup clockwise so that the yellow circle is now slightly to the side of the first label. With the permanent marker, draw and color in over the yellow circle so that it resembles the other phases of the moon, starting with Waning Gibbous and ending with a Waxing Gibbous. Label them around the cup as you go.



Repeat this process for all the phases of the moon. Eventually, you should be able to turn the inside cup so that it will model each phase of the moon in order when turned clockwise.

Phases of the Moon

Elaborate (5 minutes)	<p>Share Out: Have students share out how they constructed their models and explain what they represent. Students should physically demonstrate how their model works when sharing. Using a model of the Sun, Earth, and Moon (if available, if not use students as physical models) have the Moon move to different points of its orbit. Instruct students to move their cup model to the phase of the Moon that would correspond. Do this several times, walk around to check their models or have them hold them up so you can evaluate.</p>	<p>Materials: Completed models Model of Sun, Moon, and Earth</p>
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Evaluate (5 minutes)	<p>Wrap-up Questions: What do we mean when we say a “phase” of the Moon? What is the difference between waxing and waning? How many days does a full cycle of all phases of the Moon take? Encourage students to look up at the Moon over the next several nights. Have them share their observations when they come to school the next day.</p>	<p>Materials: N/A</p>
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Extensions and Enrichment:

Have students keep a “Lunar Log” of their own observations of the Moon each night. Do this for a week or even a whole 29 days so they observe a full cycle.

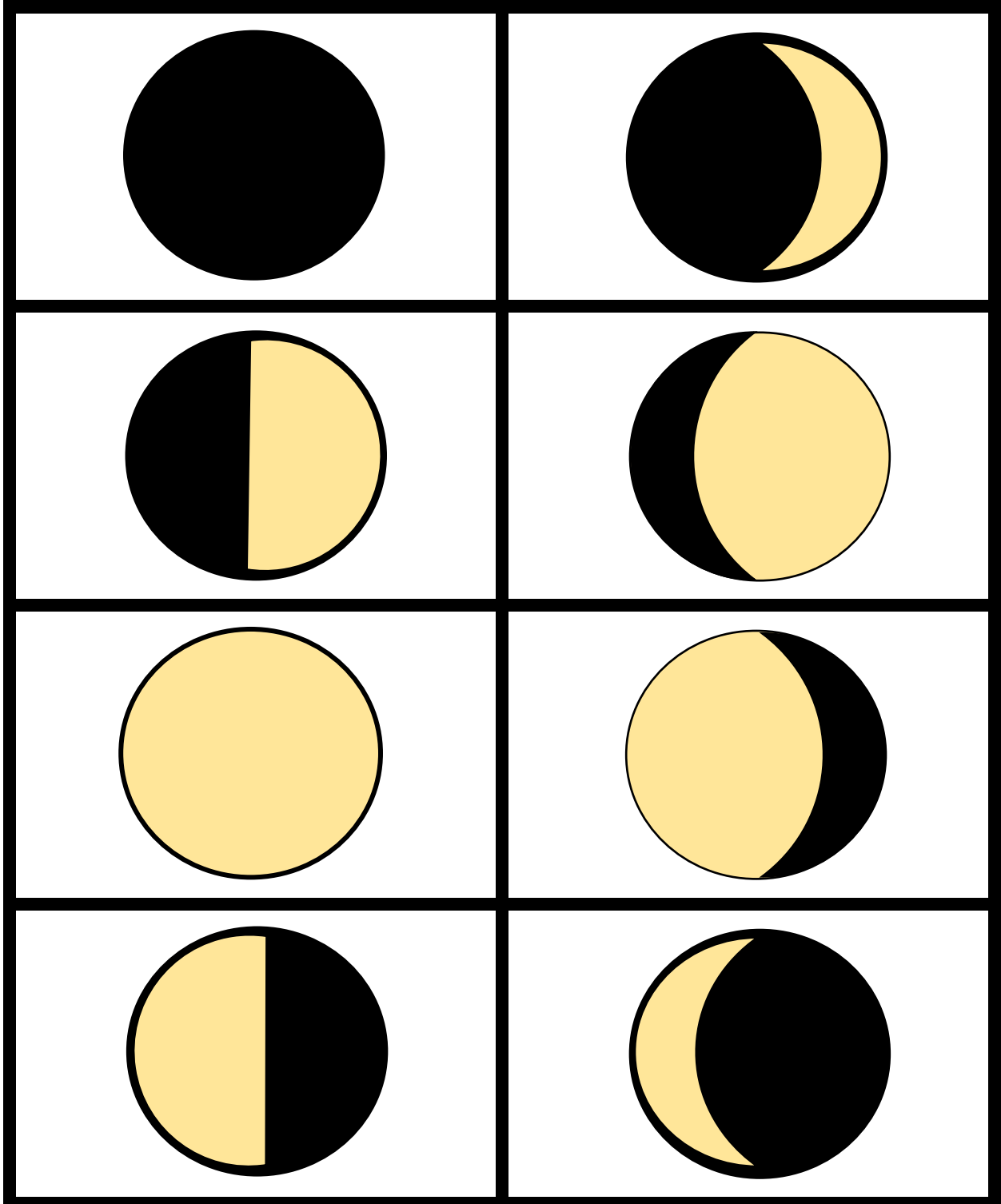
Additional Resources:

See attached worksheets.

<https://moon.nasa.gov/resources/154/moon-phase-and-libration-2018/>

<https://moon.nasa.gov/resources/54/phases-of-the-moon/>

Phases of the Moon



Phases of the Moon

New Moon	Waxing Crescent
First Quarter	Waxing Gibbous
Full Moon	Waning Gibbous
Last Quarter	Waning Crescent

Phases of the Moon

Follow the directions to construct your own model of the phases of the Moon.

Materials:

2 large clear plastic cups

Black permanent marker

Yellow construction paper

Black or white construction paper

Tape

Glue

Scissors

Directions:

The piece of black or white construction paper will go around the inside of one of the plastic cups. Measure it by fitting it inside the cup so that the entire inside is covered with the paper. The paper should go all the way to the top of the cup. Once this is done, cut and tape/glue the paper inside the cup.

Using the yellow construction paper, measure and cut out a circle slightly larger than a quarter. Set this to the side. It will be used in the next step.

On the cup with construction paper inside, glue a circle anywhere on the cup that is about halfway up the side of the cup. Once you find a spot, glue the circle to the outside of the cup with the black construction paper.

Stack the cups. Make sure you can see your circle clearly. Take your permanent marker. Underneath the full yellow circle write "Full Moon" or to save space, abbreviate to "FM."

Turn the inside cup clockwise so that the yellow circle is now slightly to the side of the first label. With the permanent marker, draw and color in over the yellow circle so that it resembles the waxing crescent phase. Label underneath the circle "Waxing Crescent" or to save space, abbreviate to WXC.

Repeat this process for all the phases of the moon. Eventually, you should be able to turn the inside cup so that it will model each phase of the moon in order when turned clockwise.