



Moon Phase Lesson Plan

Objectives: 1. Describe the phases of the moon; 2. Explain the process of the moon's changing appearance from the Earth's perspective

Materials: Ping pong ball on a stick for each student; a larger sphere (15 cm. or so) on a stick for teacher; A lamp with a bright bulb (400 watts) and the shade removed. A dark room is also required. **Diagram handout for 3 levels of English proficiency.**

Procedure:

Assemble students in a circle around the lamp. Pair ELLs with native speakers for assistance, asking native speakers to help the ELLs complete the activity and the handout. At each step, model each placement of the "moon" while clearly stating the directions. With the lamp in the center of the room have each student place the ball at arm's length between the bulb and their eyes. They should hold the pencil in their left hand. State while pointing to each object: "The bulb is the Sun, the ball is the Moon and you are Earth." **Show the labeled pictures of each as well as the labeled diagram.**

Usually the Moon passes above or below the Sun as viewed from Earth. Have the students move their moon up or down a bit so that they are looking into the Sun. As they look up (or down) at their moon they will see that all of the sunlight is shining on the far side, opposite the side that they are viewing. This phase is called "new moon" (like "no moon"). **Gesture to them to pick up their handouts and pencils to complete their task for new moon. Model the task of shading in the drawing.**

They should now move their hand towards the left, about 45 degrees ($1/8$) of the way around counterclockwise. Have them observe the sunlight on their Moon now. They should see the right hand edge illuminated as a crescent. The crescent will start out very thin and fatten up as the Moon moves farther away from the Sun. **Gesture to them to pick up their handouts and pencils to complete their task for this phase of the moon.**

When their Moon is at 90 degrees to the left students will see the right half of the Moon illuminated. This phase is called "first quarter." Remember that fully one half of the sphere is illuminated at all times (except during lunar eclipses) but the illuminated portion that we observe changes as the Moon changes position. **Gesture to them to pick up their handouts and pencils to complete their task for this phase of the moon.**

As they continue to move counter-clockwise past first quarter, the Moon goes into its "gibbous" phase (more than half but less than fully illuminated), which grows as the Moon moves towards 180 degrees. **Gesture to them to pick up their handouts and pencils to complete their task for this phase of the moon.**

When the Moon reaches the position directly opposite the Sun, as viewed from Earth, the half viewed from Earth is fully illuminated (unless the student's head is causing a lunar eclipse). Of course only half of the Moon is illuminated. It has taken the Moon about two weeks to move from new to full. This growth in illumination is known as "waxing." **Gesture to them to pick up their handouts and pencils to complete their task for this phase of the moon.**

Students should now switch the pencil to their right hand and face in the general direction of the Sun. Starting with the Moon at full, students should continue the Moon's counterclockwise motion. They will observe the



reverse of the Moon's phases seen so far with the left portion of the Moon illuminated. **As with the previous phases of the moon, gesture to them to pick up their handouts and pencils to complete their task after experiencing each phase of the moon.**

After the gibbous phase diminishes, the Moon will reach the 270 degrees position, straight out to the right. This is "third" or "last quarter." It is followed by a thinning crescent and a return to new moon. From full to new the Moon has been "waning" and leading the Sun. The phase cycle takes 29.53 days.

Ask students to check their papers with their partners.

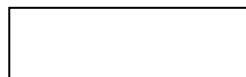
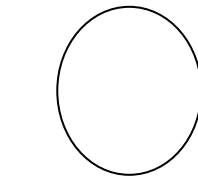
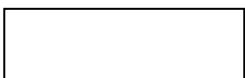
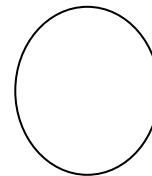
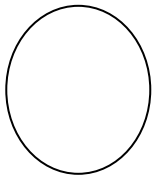
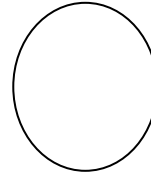
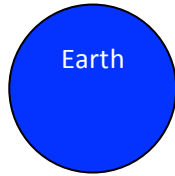
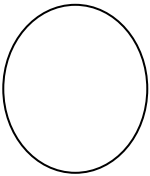
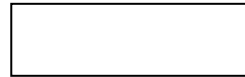
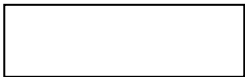
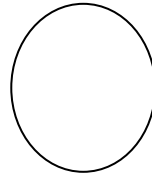
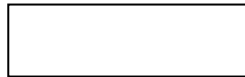
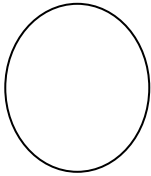
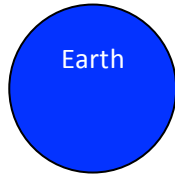
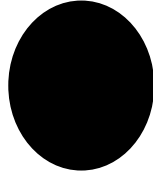
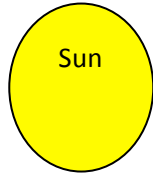
Have native speakers complete a Science Writing Heuristic in their science journals while teacher meets with ELLs to review their diagrams, clearly stating each word while pointing to the appropriate term. Teacher can provide language clues, such as pointing out the word "quarter" in both "first quarter" and "last quarter" and writing " $\frac{1}{4}$ " next to it, etc.

Adapted from Educator's Guide to Moon Phases <http://education.jpl.nasa.gov/educators/moonphase.html>

<http://engage.ucf.edu/v/p/rra6jCM>



For English proficient students. Shade each moon picture & write the correct term.





For beginning English language learners—Shade each moon picture and draw a line from the correct term to the drawing of the phase of the moon.

Full moon

First quarter

Waxing gibbous

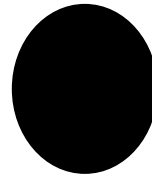
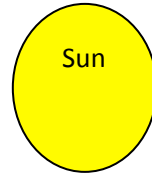
Waxing crescent

Last quarter

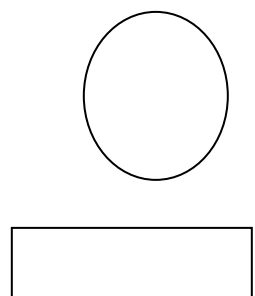
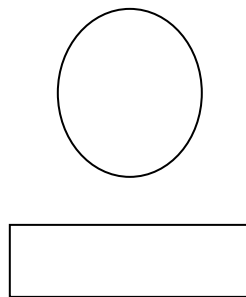
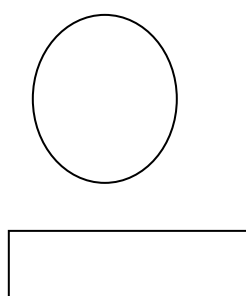
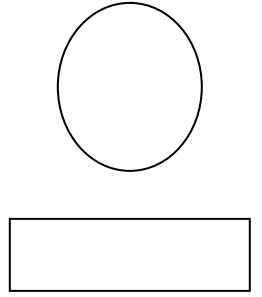
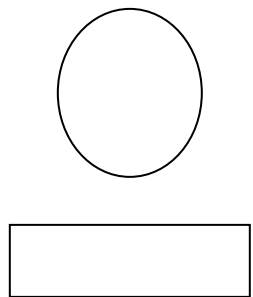
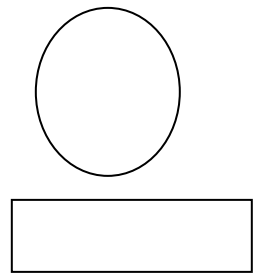
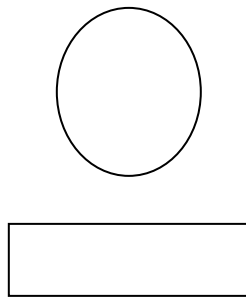
Waning crescent

Waning gibbous

New Moon



New Moon





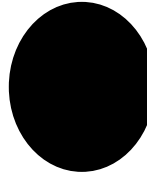
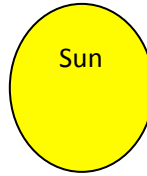
For intermediate English language learners—Shade each moon picture and copy the correct term next to the drawing of the phase of the moon.

Full moon

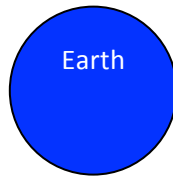
First quarter

Waxing gibbous

Waxing crescent



New Moon



Last quarter

Waning crescent

Waning gibbous

New Moon

