



PHASES of the MOON

Earth Science Tech-lesson Guide Lite

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Phases of the Moon

BACKGROUND

The moon is Earth's only natural satellite, and it takes 27 and 1/3 days for it to make a complete orbit., termed a sidereal month. As it makes this revolution, it is also rotating on its axis causing us to see only one side. The moon does not make its own light, although we see it shining in the night's sky. Rather, the moon is reflecting the sun's rays with half of it always illuminated and half in shadow. The moon appears to change shape because the sun lights the same side of the moon as it rotates and revolves around Earth, but varying portions of the lighted side face the Earth at different times. The different shapes, or amounts, of reflected sunlight is referred to as the moon's phases. It takes 29 and 1/2 days for a complete cycle of the phases, the synodic or lunar month, to occur. The phase that we observe is dependent upon the position of the Earth, the moon, and their relationship to the sun.

View Video:

<http://www.neok12.com/php/watch.php?v=zX5c60455063656c6c595c41&t=Moon>

New Moon- moon almost directly between sun and Earth, no reflected light.

Crescent- moon is waxing, thumbnail shape.

First Quarter- moon is quarter way around Earth, appears as half lit.

Gibbous- waxing between first-quarter and full moon.

Full- entire face we see is illuminated.

Gibbous- waning between full and last-quarter moon.

Last Quarter- moon is three quarters of its orbit around Earth, again seen as half-lit.

Crescent- moon is waning, seen as small sliver again.

New Moon- no reflected light.

VOCABULARY

Objective: students will understand that the phases of the moon are the result of reflected sunlight as the moon rotates and revolves around the Earth.

Materials

3 inch Styrofoam balls

Pencils

Markers

Flashlights

Questions

1. Why does the moon seem to shine and glow?
2. Where does the moon get its light?
3. Why does the moon appear to change shape?

Literature Connection

“The Moon Seems to Change” by Franklyn M. Brandley

ENGAGE

1. Work in groups of 2 or 4 in a very dark room.
2. Give each group a Styrofoam ball, a flashlight, marker, and pencil. Stick the pencil into the ball and draw a line all around the center of it. Draw a large X on one half of the ball.
3. The Styrofoam ball represents the moon, the students’ heads will be the Earth, and the flashlight is the sun.

Explore

<http://www.childrensuniversity.manchester.ac.uk/interactives/science/earthandbeyond/phases/>

EXPLAIN

1. Students hold the ball a bit above their heads so they have to look up to see it, with the X toward them. Someone on the other side of the ball shines the flashlight on it. They can’t see the lighted half of the ball. This is a **NEW MOON**. Remaining in the same spot, students will rotate counter-clockwise while holding the ball in front of them and a bit above their heads. They will see a small part of lighted half. This is the **CRES-CENT MOON**.
2. Students keep turning and see more (the waxing) of the lighted ball, until they see the entire lighted half, from **QUARTER MOON** to **FULL MOON**.
3. Students continue turning to observe the light reflected on the ball waning, until they have made a complete rotation, seeing all the phases of the ball– the moon.
4. Students record their observations on chart paper.
5. Label the moon’s phases.

<http://www.neok12.com/diagram/Moon-01.htm>

EXTEND

Learn more about the moon’s phases during its 29 1/2 day cycle (lunar month), and make predictions about what phase it will be in a week, two weeks, or two months from now.

http://sciencenetlinks.com/media/filer/2011/10/14/moon_challenge.html

