

Moon Observations

Summary

Students will create a model of the moon and use a flashlight to illustrate the various phases of the moon.

Materials

- *The Moon Seems to Change*
 , by Franklyn M. Bra
- [Word Cards](#) (pdf)
- [Picture Cards](#) (pdf)
- Styrofoam balls 3"
- Pencil
- Marker
- Flashlights
- Four Oreo cookies per student and a plastic knife or popsicle stick
- Chart paper
- [Phases of the Moon Animated Flip-book](#) (pdf)

Additional Resources

Book

- *The Moon Book*
 , by Gail Gibbons; ISBN 061312887
- *The Moon Seems to Change*
 , by Franklyn M. Branley; ISBN 0690045859
- *Footprints on the Moon*
 , by Alexandra Siy; ISBN 1570914095

CD

- *America's History Through The Twentieth Century*
 (One Small Step For Man...) Classroom Classics (801) 489-5225

Background for Teachers

Because the moon rotates once on its axis every time it travels around Earth, we see only one side. The far side was not seen until the 1960's, when spacecraft were sent to orbit the moon and pictures were taken. One half of the moon is always fully illuminated and one half is always in shadow. The amount of illumination or shadowed areas we see depends on the position of Earth, the moon, and the sun.

The surface of the moon has mountains, valleys, craters, and plains. The moon has no atmosphere, but it does have traces of ice, possibly from an object that hit the moon.

As a satellite, the moon revolves around Earth. The moon actually takes 27 1/3 days to orbit Earth. This time is known as a sidereal month. However, it takes 29 1/2 days for a complete cycle of the moon phases to occur, when measured from new moon to new moon. This period is known as the synodic, or lunar month.

The moon rotates on its axis only once during its revolution around Earth.

The moon reflects sunlight. We see only the lighted part of the moon that faces Earth.

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 Earth at different times. The phases of the moon include the new moon, crescent moon, half moon, and full moon.

Science Language Students Should Use

model -- small copy of something

orbit -- the path followed by a heavenly body going around another

sphere -- a space figure that has the shape of a round ball. A three-dimensional figure that has the shape of a ball.

moon -- heavenly body that revolves around the Earth

axis -- a real or imaginary straight line about which something turns

rotation -- to turn around a center point or axis (spinning)

revolution -- to move in an orbit while rotating to move around an object while rotating (spinning)

Intended Learning Outcomes

1. Use Science Process and Thinking Skills
2. Manifest Scientific Attitudes and Interests
3. Understand Science Concepts and Principles
4. Communicate Effectively Using Science Language and Reasoning

Instructional Procedures

Invitation to Learn

Pass out *Word Cards* and *Picture Cards* to pairs of students. Have students match *Word Cards* to *Picture Cards*.

Instructional Procedures

Read *The Moon Seems to Change* by Franklyn M. Branley.

Work in groups of two or four. Give each group a Styrofoam ball, marker, and a pencil. Stick the pencil into the ball. Push it in far enough so the Styrofoam ball doesn't fall off. Draw a line all around the ball with the marker or use an elastic. Make a big X on one half of the ball.

The Styrofoam ball will be the moon, and your head will be Earth. The flashlight is the sun.

Hold the ball a bit above your head so that you have to look up to see it. Turn it so that the X is toward you. Have someone on the other side of the ball shine the flashlight on it. Do this in a dark room—the darker the better. You cannot see the lighted half of the ball. It is a new moon.

Stand on one spot. Turn your body counter clockwise a bit while holding the ball in front of you and a bit above your head. Always keep the X toward you. You will see a small part of the lighted half. It is a crescent moon. Keep turning, and soon you will see more of the lighted half of the ball. It is a first quarter moon. Keep the ball above your head and turn some more. Soon you will see all the lighted half of the ball. The moon is full. Keep turning and you will see less and less of the lighted part of the ball. You will see one quarter of it—the third quarter moon. Then you'll see a thin crescent. When you have turned all the way around, you have seen all the phases of the ball—the phases of the moon.

Color and cut out the *Phases of the Moon Animated Flip-book*.

Extensions

Read *Footprints on the Moon* or any other book about lunar modules. Discuss with the students how the lunar module Eagle was used to take astronauts to the moon's surface. Tell the students the lunar modules were used to carry astronauts from the command module to the surface of the moon. Then invite them to draw geometric lunar modules according to the directions below (review the italicized words). Give each student a ruler and a sheet of drawing paper. Instruct students to draw their modules as you read each step one at a time. Have students add details that show their modules being used for lunar exploration. Then, have them color their out-of-this-world scenes.

Draw a *trapezoid* in the center of your paper so that the top is the longest side.

Draw a *diamond (rhombus)* showing a point touching the top center of the trapezoid.

Draw a *hexagon* to the left of the diamond, each showing a side touching the trapezoid.

Draw two *triangles* to the right of the diamond, each showing a side touching the trapezoid.

Draw a small *circle* at the lower end of each rectangle.

Family Connections

Check out Moon Box to and share with family.

Flip book to share with family.

Oreo chart showing moon phases.

Assessment Plan

Give each student four Oreo cookies and a plastic knife. Students make a chart showing New Moon, Waxing Crescent, First Quarter, Full Moon, Third Quarter, and Waning Crescent. With their knives they scrap away the frosting to represent each phase.

Have students write the phases of the moon on their *Phases of the Moon Animated Flip-books*.

Make a miniature matchbook with pictures and vocabulary words.

Fold a sheet of paper (8 1/2" x 11") in half like a hot dog.

Cut the sheet in half along the fold line.

Fold the two long strips in half like hot dogs, leaving one side 1/2" shorter than the other side.

Fold 1/2" tab over the shorter side on each strip.

Cut each of the two strips in half, forming four halves. Then cut each half into thirds making 12 miniature matchbooks.

Glue the 12 small matchbooks inside a hamburger folded piece of construction paper.

Authors

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