

A Moon With a View

Summary

Teacher demonstrations and small group activities help students understand the rotation of the Earth and the appearance of movement of other bodies in the sky.

Group Size

Small Groups

Materials

- Playground ball
- Camera
- Poster board
- Markers or crayons
- Moon review kit⁸

Additional Resources

Books

Eyewitness Books: Astronomy, by Kristen Lippincott; ISBN 0-75660656-X

Space: A Nonfiction Companion to Midnight on the Moon, by Mary Pope Osborne; ISBN 0-375-81356-x

Background for Teachers

When Earth and moon rotate, they turn to the left. This is easily remembered by asking the students to place their hand over the heart as when saying the "Pledge of Allegiance," then push with that hand toward the shoulder closest to the hand, thus turning the individual toward the left.

The teacher should understand that the moon and Earth do not rotate on the same plane. This is why eclipses are much less frequent than the students might think.

Using the technology of space travel we have been able to see both Earth and the moon from space. In this activity we will help the students understand better what astronauts and astronomers see by using technology and models.

Remember to turn the flash off on cameras for this activity, otherwise you lose the shadows we are looking for.

Intended Learning Outcomes

1. Use science process and thinking skills.
2. Manifest scientific attitudes and interests.

Instructional Procedures

Invitation to Learn

Using a "Moon in My Room" lamp, ask the students to name the phases of the moon as it moves through the eight phases of lights on the lamp. This is a great attention getter. The students will be excited to learn more.

After demonstrating the "Moon in My Room" lamp, pass out paper cups and a piece of paper to make a paper version of their own moon phases.

Use the paper cup to make eight circles on a piece of blank paper. Then draw each of the phases on the different circles and cut them out. Fold the circles in half vertically. Glue the left half of the first phase to the right half of the next phase and so on until you have glued all the way around. One of the great features of this little gem is that it works as well upside down as right side up. They now

have their own moon review kit.

Have the students make a pocket for their moon review kit in their science journal.

Instructional Procedures Which View of the Moon?

Explain that we are going to build a model of Earth and the moon.

After dividing the class into small groups, ask each group to invent a constellation or choose a constellation they already know and draw it on a poster or large piece of paper.

Have the students retrieve their moon review kit from the invitation to learn activity above and keep it with them for this activity.

Move the desks away from the center of your room to make enough space in your classroom for a large circle of students.

Have half, (or one third if you have a large group), of the class stand in the middle of the room, in a circle facing outward. This is Earth. Make the circle as small as possible. Place a globe of Earth in the center of the circle on a table or tall cart, or hang it from the ceiling.

Put eight chairs in a circle around and facing Earth. If possible these should be about ten feet from Earth. These chairs mark the path of the moon.

Ask one child to represent the moon, or the teacher may take this place being taller than the standing students on Earth so the sun can shine on it during all phases.

Invite the rest of the class to hold the "constellation" posters around the outside of the room.

Turn on a desk lamp or spotlight to be the sun. Turn off other lights and darken the room as much as possible. The sun and moon should not be in the same plane. Discuss what would happen if they were. Explain that we would have eclipses more regularly if this were the case.

Invite one student to use a camera to document what Earthlings see.

When everyone is in place, ask the students to take time to predict what they think they will see.

Have the "moon" start at the chair closest to the sun. Remember, the moon should face Earth. You might have the "moon" record what it sees of Earth with a digital camera each time it moves to a new chair, remembering that the moon would always look only toward Earth. If the teacher is serving as "moon", a student may be asked to take the pictures.

The "Earthling" students should now move their circle to the left a full rotation taking time to find and compare what they see with the moon review kit what they are seeing of the moon after each rotation.

The "moon" should move one chair to the left of Earth in its orbit for each rotation of Earth.

Repeat steps 12 and 13 a few times. It may not be necessary for Earth to rotate eight times before having the groups trade places.

Students who were "on Earth" should trade places with constellations and the moon.

After everyone has had the opportunity to see the view from both Earth and in space have the students return desks to their places and allow time to record what was seen. Encourage creativity in the kind of entry: pop-ups, drawings, written and so on.

Invite a few students to share and discuss with the class what they have recorded.

For review on another day, share the pictures taken with the camera and discuss and compare with journal entries.

Extensions

Curriculum Extensions/Adaptations/ Integration

Use a camera to take pictures from one of the constellations. What do you think an alien might see?

Use the digital camera in video mode on Earth without stopping after each rotation of Earth to get a different feeling for the activity.

Moon dance, invite everyone to hold the ping-pong ball from "The Earth is Flat" activity with only

one source of light in the room at the side of the room, and ask them to turn around in a circle while watching the ball. Have them record what they saw in their science journal with pictures, words or pop-ups.

Invite children with special needs to be the one to turn the sun on and off at the times designated by the teacher, or make sure they are part of one of the constellations. If they need to be active, have them be a comet passing through the solar system with a flashlight. Those who have trouble writing in a journal may use a tape recorder to record their ideas and then have a parent transcribe them (home connection).

If you ask a Chinese person when their birthday is or a Muslim when the next Ramadan or Aid al Adha starts, what kind of calendar would they use to give you an answer? Discuss the fact that many cultures have used and continue to use a lunar calendar.

Show the class how to make "pop-up" entries in their journal. Encourage some of the entries to be pop-ups. Allow for creativity and time to finish and share with the class using the document camera.

Family Connections

Use a protractor with a straw attached along the flat side of the protractor, and a string tied through the center of the straw side with a weight at the end of the string as a measurement tool, sight along the straw and mark where the string is on the protractor. Keep a journal of the moon for one month or more. Each night at the same time of night, from the new moon to full moon, observe the moon using the protractor to note the angle in the sky for the location of the moon and which way the observer is facing, (a magnetic compass may be needed). On at least two nights go out two or three times to note that on any given night the moon seems to stay with the constellations, but on different nights it follows different constellations. After the full moon, observations will be more successful in the early morning. What path do you think the moon will follow? Does the moon track across the sky from east to west along the same path the sun does? What is the overall pattern of the moon's path across the sky in one month, 2 months, 6 months? Are those paths the same?

Assessment Plan

Ask the students to share with others at their table how the appearance of what we see from the moon, from Earth and from the stars is different and which one we might call "real". How does this help them understand what we see on Earth?

Use the "Moon in My Room" to show different phases for review during different times of the day and the year.

Bibliography

Research Basis

Waters, J. K., (2007-12-00). Social Studies Teachers' Perspectives of Technology Integration. *T.H.E. Journal*, Volume 34 (Number 12), Pages 41-44

Menko Johnson, an instructional technologist at San Jose State University, believes that successful synchronizing of technology in the classroom puts the teaching before the gadgetry and will benefit both the teacher and the student.

Starkman, N., (2007-06-00). Sound Solutions. *T.H.E. Journal*, Volume 34 (Number 6), Page 22

Poor classroom acoustics have more to do with poor learning than one might suspect. A good sound system can do a great deal to help both the students and the teacher.

Authors

[Utah LessonPlans](#)