

I See The Moon

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Overview

Topic: In this lesson, students will explore the relationship between the moon and the earth. They will identify the four phases of the moon and examine important physical characteristics of the moon. Students will also discuss what is needed for humans to survive on the moon.

Length of Lesson

2 40-minute lessons

Instructional Video/Technology

Take A Look I #13, The Moon

(Extensions) - *Bill Nye the Science Guy: The Moon*
(Schedule available from PBS online)

(Extensions) - Laserdisk: *Windows on Science*
Primary Volume 2, Unit 2, Lessons 2.3.3 - 2.3.6

Learning Objectives

The student will be able to:

- identify the four phases of the moon
(Va. SOL Science 4.7, 6.10)
- list five important characteristics of the moon
(ex. rocks, craters, dusty, no air, no light of it's own, it's size, little gravity, no life, etc.)
(Va. SOL Science 4.7, 6.10)
- explain what would be needed for us to survive on the moon and why we would need these things (Va. SOL Science 4.7, 6.10)
- estimate and measure weight/mass
(Va. SOL Math 3.14, 4.11)
- estimate and measure length
(Va. SOL Math 3.14, 4.12)

Materials

For Pre-Viewing Activities:

- Activity Sheet. (The pictures could be enlarged using a copy machine or opaque projector.)

For Viewing Activities:

- Bright lamp or flashlight
- Three labels with earth, moon and sun written on each one to help the students remember who is acting out each part.
- Index cards or pieces of paper

For Post-Viewing Activities:

- Four or five shallow, rectangular boxes
- Two bags of flour
- 2 - 3 cans of cinnamon, paprika or something similar
- several small rocks, balls, or marbles for each group
- tape measures or rulers for each group
- paper for each group to record data
- several pieces of different color construction paper available for use in skirts if needed
- one or two sets of encyclopedias
- several non-fiction books about the moon
- two or three sheets of drawing paper for each student for use with several of the activities



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Vocabulary Words

moon
moon phases
lunar
moon's surface
craters

Pre-Viewing Activities

1. Hold up the pictures (Activity Sheet attached) of the cow jumping over the moon, the man in the moon, the cream cheese moon, and the werewolf, one at a time and ask the students to comment on what they see.
2. Lead a discussion to include myths and legends about the moon and ask students if they can think of any other stories or poems about the moon.
3. Discuss the myth behind werewolves and full moons and the meanings of lunar and lunatic.

Focus for Viewing

To give students a specific responsibility while viewing, explain to the students that today they are going to see a video and explore many facts about the moon.

Viewing Activities

1. Ask the students to watch the beginning of *Take a Look 1, #13* and listen for the first question. **START** the video at the beginning of the program. **STOP** after the boy asks the first question, "Did you ever take a good look at the moon and wonder why it's different every night?" Discuss student responses.
2. Focus: Ask the students to be able to tell how people can tell what the moon will look like? **START** the video and **PAUSE** after the lady says, "the moon has four phases". Ask students to respond to the question. (Answer: Because the

moon has four phases.)

3. Focus: Say, "Now let's find out the names of these four phases and how often they occur. Listen carefully and see if you can tell me. **START** the video and **STOP** when the lady says "Once you know this, it's easy to predict when the moon will be out and what it will look like." Say: "Who can name the four phases?" (Answer: new, first quarter, full moon, last quarter) "How often do these four phases occur?" (Answer: once a month) Say: "Okay, let's try a bonus question. Who can remember how to spell phases?" (p-h-a-s-e-s)
4. Say: Okay, class. Let's see how these four phases occur. **START** the video and show the demonstration of the moon's phases. **STOP** when the lady says "Would you turn the light on for me?"
5. At this point, perform this demonstration in your classroom. Set up the bright light in a corner of the room. Ask one student to be the earth and you or another student be the moon. Go through the four phases just like the video explained. (You may need to let several students stand with or pretend to be the earth so that everyone has an opportunity to see the light on the moon's face.)
6. **REWIND** the tape to the beginning of the demonstration where the lady and the boy go into the house. Refocus by asking the students to watch the demonstration one more time and relate it to what we just did in the classroom, deciding if our experiment worked as well as theirs did. Also ask them to listen to see if they can find out if the moon has it's own light and where it comes from. (This section could be shown with the **SOUND OFF**. The students could explain what was happening and name each phase. Turn the **SOUND ON** as the lady points for the boy to turn the light back on.) **STOP** when the voice says "that's the way the moon looks from earth," as the picture of the moon comes over the horizon. Give the students a few minutes to discuss how their experiment compared to the video and why it may have been different. If you kept the sound on, see if they were about to catch where the moon's light comes from. This would also be a good time to review the phases of the moon one more time before going on.

7. Focus by saying, "We have seen what the moon looks like from the earth and examined the four phases of the moon. Let's think about what the moon would look like if we were to visit it. Let's listen to find out what the first astronauts found when they arrived on the moon (Answer: rocks, craters) and how they were made (Answer: Scientists think they were made by meteors and volcanoes). **STOP** after the words, "some people think this pattern looks like a face". Discuss answers.

8. Before the next section, give each student an index card or piece of paper. Focus by asking students to listen for at least one thing they would need to survive on the moon and write it on their card. **STOP** at the statement "...cool during the hot daytime and warm during the very cold nighttime". Give them a minute to brainstorm in small groups and write down some other things they think they may need to stay on the moon for an extended visit. Discuss their answers and decide if the items are truly needed.

9. Focus by asking the students to watch the next segment of the video and write on the back of their cards why it is always so dusty and why walking is so easy and fun. **START** the video and **STOP** after the man says, "...and if you ever get the chance to visit, you might find some of the things you left behind". Discuss students' answers.

Post-Viewing Activities

1. Making craters. Say: We've just seen moon craters that were made by meteorites, now we are going to make a classroom model of these impact craters ourselves. Give each group of 3 - 4 students a shallow box. (Small shirt gift boxes are good.) Fill the box about half full of flour. Sprinkle the top of the flour with a solid layer of paprika or cinnamon, etc. Drop different size meteorites (rocks, small balls or marbles) into the flour. Observe the different craters made. Measure the length of the "splash" made by each asteroid. Discuss how this simulates the surface of the moon.

2. Have students drop the same object several times

at different heights. (Each group could choose a different object to work with.) Let them estimate and then measure the diameter of the crater. Have them measure and record the distance dropped and the diameter of the crater. Students can observe if there is a correlation between the distance an object is dropped and the diameter of the crater it will make.

Have students weigh their objects before they drop them and then estimate and measure the diameter of the crater. Record the object's weight and the diameter of the crater it made. Students can see the correlation between weight of objects and the type of crater they will make.

3. Have students work in small groups to prepare skits about living and surviving on the moon. Have them make labels or draw and cut out the things they will need. The skits should be at least three to five minutes long.

4. Have students draw and label the four phases of the moon. Allow them to reconstruct the experiment from the video for review.

5. Have students make a list of as many characteristics of the moon as they can find. You could offer an incentive for the person who finds the most true characteristics. Have encyclopedias and books about the moon available for this activity, the Internet would be an excellent resource.

6. Have the students construct a calendar for the month in which they are studying the moon and earth. On this calendar, they should observe and draw the moon at home each night for that month, which enables them to observe an entire moon phase cycle. (The last segment of the video explains this project in detail.)

Assessment

1. Observe each group as they work together to make and measure craters on their "moon surface" to see how they are working and thinking together. Discuss the results of dropping objects at different distances and how objects of different weights can make different craters.

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2. Have students present their skits about living and surviving on the moon to the class. The skits could also be videotaped and shown to other classes and/or at PTA and parent conferences.

3. Check each student's drawing of the phases of the moon and/or observe students as they demonstrate and explain the phases using the experiment from the video.

4. Check the students' lists of characteristics of the moon's surface for accuracy and give incentives to the winner.

5. Have students share their month's calendar of the phases of the moon with the class.

Action Plan

1. Invite a local amateur astronomer in to talk to the class.

2. Students could write to NASA Space Center for information and pictures about the moon at the National Aeronautics & Space Administration, Washington, DC.

Extensions

Writing: Brainstorm with students a list of words to describe the moon. Have students use the word list to write poems about the moon.

Math: Have students find out how much they would weigh on the moon. (Divide your earth weight by six.)

Social Studies: Have students research and do reports on astronauts and scientists who have made contributions to space exploration and astronomy.

Music: Have students bring in the name of a song that refers to the moon in some way (ex. Blue Moon, Moon Over Miami, etc.). Have them bring in an actual recording or words to the song if possible.

Art: Have students draw pictures of their interpretation of different moon sayings or moon songs.

Reading: Set up a classroom library of fiction and non-fiction books about the moon for students' use.

Media Skills: Students can videotape their skits about living and surviving on the moon.

Technology: Students can visit the following Internet sites for more information about the moon:

<http://geocities.com/RainForest/4221/moonnow.htm> (shows the present month's phases and how the phases come about)

<http://science.cc.uwf.edu/sh/curr/moon/moon.htm> (great information and pictures of the moon, explains the four phases and gives classroom activities)

<http://khobs-kyunghee.ac.kr/cgi-bin/moon4> (shows what the moon looked like on a specific day. Type in your birthdate and it will show you what phase the moon was in on that day.)

<http://bang.lanl.gov/solarsys/moon.htm> (good source of information and statistics)

<http://scrtec.org/track/tracks/f00051.html> (student resources to the moon)

<http://www.nasa.gov> (many resources and pictures)

Activity Sheet

