

Our Amazing Moon

Students will explore the changing relationships between the Sun, the Earth and the Moon through a kinesthetic model and a hands-on craft project.

Grade Level : Kindergarten

Objectives:

- Students will understand the basic relationships between the Sun, the Moon and the Earth.
- Students will be able to explain why there is day and night.
- Students will know the Moon appears the change shape in the sky.

Materials:

- Flashlight
- Moon poster
- Moon phase poster (pp. 7-9)
- For each student:
 - ⇒ Glue stick
 - ⇒ Safety scissors
 - ⇒ Photocopy of Moon Phases Student Page (pp.5-6)
 - ⇒ Half-sheet of black construction paper (cut length-wise)

Time Considerations

- Preparations:
- Activities:
 - 1– Day and Night: 15 min
 - 2– Moon Basics: 5 min
 - 3– Story Time: 10 min
 - 4– Moon Phases: 20 min

Related Activities:

Sun Rays, Kinesthetic Astronomy, Comparing Worlds



Nevada Department of Education Standards

- **E.2.B Students understand there are objects in the sky, which display patterns.**
E.2.B.1 Students know objects in the sky display patterns in how they look, where they are located, and how they move. I/S **E.2.B.2. Students know the Sun rises everyday and the Moon can rise during the day and/or during the night. E/S** **E.2.B.3 Students know the Sun and Moon appear to move across the sky. I/L** **E.2.B.4 Students know the Moon appears to change shape over the course of a month.**
- **N.2.A Students understand that science is an active process of systematically examining the natural world.**
N.2.A.3 Students know observable patterns can be used to predict future events or sort items. E/S

Excellence in Environmental Education Guidelines

- **Strand 1-Questioning, Analysis and Interpretation Skills (A—Questioning):** Learners are able to develop questions that help them learn about the environment and do simple investigations. **(F-Working with models and simulations):** Learners understand that relationships, patterns, and processes can be represented by models. **(G-Drawing conclusions and developing explanations):** Learners can develop simple explanations that address their questions about the environment.

Background

Standing on the surface of the Earth, it appears that the Earth is stationary and the Sun and the Moon rotate around it. However, the hard work and perseverance of early astronomers showed that the Sun is actually at the center of the Solar System, that the Earth orbits around the Sun and that the Moon orbits around the Earth.

We can't take a trip out into space to observe how the Sun, the Earth and the Moon are moving in relation to each other, but with models, astronomers can explore these relationships and better understand them. Just like astronomers, in this lesson students will make models of the Sun, the Earth and the Moon to understand the repeating cycles which these space objects go through,

and the simple concepts of day and night. Additionally, we can use our memories of the Moon at different phases to introduce the changing Moon Phases.

The twenty-four-hour rotation of the Earth causes the ever-shining Sun to appear to move across the sky. Additionally, the orbit of the Moon around the earth about once a month causes the Moon to appear to rise and set in the sky. Presence of the Moon is often associated with night, but an observant student will know that the Moon is also often visible during the day. The Moon itself does not give off light, but reflects the light of the Sun, and this causes the Moon to appear to change shape over the course of its orbit around Earth. These changes are called the phases of the Moon.



The Earth's Moon.

Preparations

Prepare needed items. Cut black construction paper lengthwise in advance. Laminate moon phase poster and a

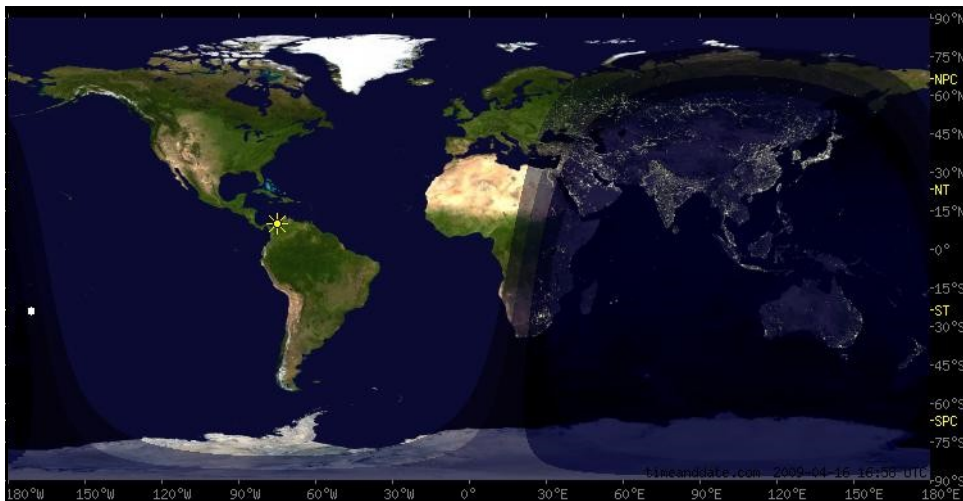
poster of a close up picture of the Moon.

Doing the Activity

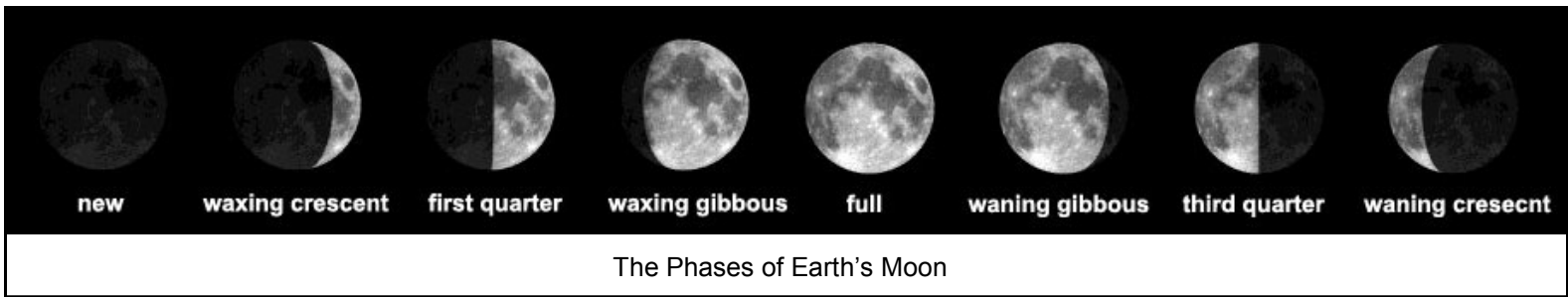
Activity 1—Day and Night
Start the lesson by asking stu-

dents to talk to a partner about what the sun is. Then explain that the Sun is a star (large burning ball of gases) that is relatively close to our Earth and that's why it looks so different from the other stars that we only see at night. Ask, "What does the sun give the Earth?" (*light and heat.*)

Next ask students if the Earth moves. (*yes, it rotates on its axis and orbits around the Sun*). Then tell students that they will now work all together as a class to act out how night and day work on Earth. Have students stand in a circle representing earth. Turn off the lights in the classroom and shine a bright flashlight on the students. Have them walk in a



Day and night on Earth on April 16, 2009 at noon.



circle (representing the Earth's rotation), while the flashlight (the Sun) stays in the same place. Explain that the flashlight acts like the Sun does towards Earth and that when the light shines on one side of the circle, that is day and the other side is dark. Stop the students periodically and ask if it is day or night for them. Explain that it takes Earth one day to complete a turn. Now, have one student volunteer be the moon. While the rest of the students are continuing to walk in a circle and represent the rotation of the Earth, have the student playing the moon walk around them to represent the Moon's orbit around the Earth.

Have students sit back down and ask students to put their thumbs up if they think the Sun shines all the time and their thumbs down if they think the Sun only shines during the day. Then tell them that the Sun is always shining and when our side of Earth is facing the Sun it is day and when our side of Earth is away from the Sun, it is night for us. Show the students that day follows night and night follows day.

Activity 2—Moon Basics

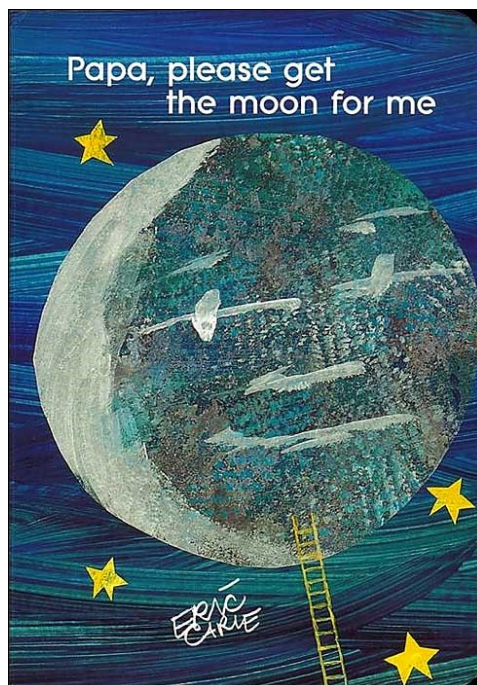
Start by having students share with a partner everything they know about how the Moon changes. Give them one minute to do this and then intro-

duce the students to the moon by asking the following questions:

- Why does the moon rise and set in the sky? *It orbits around the earth—about once a month, just like the Earth orbits around the Sun once a year.*
- Do you ever see the Moon during the day? *Yes. The moon is visible sometimes during the day and sometimes during the night.*
- Does the moon change? How? *The moon appears to change shape, but it really doesn't. The different shapes we see are the called phases of the Moon.*

Activity 3—Story Time

As an introduction to how the Moon changes and the phases



of the Moon, read the book, *Papa, Please Get the Moon for Me*, by Eric Carle. Wrap-up the book by asking students how the moon changes.

Activity 4—Moon Phases

Next, have students sit at their tables and draw a picture of one shape they have seen the Moon make. Have students share pictures with the other students at their table and see if they think that the shapes happen over and over again in the night sky. Explain that the moon phases are a regular cycle that occurs because the Moon moves around Earth every month (28 days). These phases are predictable and occur the same way each month.

Split students into groups of two. Give each group a copy of the Moon Phases Student Page, a pair of safety scissors, a glue stick and a half-sheet (cut lengthwise) of black construction paper. Have students work together to cut out the shapes of the moon. For the new moon phase (where it is all black, with a white circle) have students cut around the circle. Once all of the phases have been cut out, have students paste the pictures of the moon onto their black sheet of paper starting with number 1 and progressing to number 8. Make sure to point out to students

that the brightest part of the moon is on the bottom and the darker parts of the moon are on the top. This will help them find the right orientation for each moon cutout. Now students will have created a picture of the moon phases to reference in the future.

Conclude the lesson by reviewing the relationships between the Earth, the Sun and the Moon and how the Moon and Sun appear to change and move in the Earth's sky.

Evaluation—

Informally evaluate students by their ability to engage in group discussion about day and night and the moon. Formally evaluate students by their ability to identify if it is day or night for them during Activity 1, to tell why there is day and night on Earth, to describe the changing moon shapes in the sky and their ability to correctly follow directions and paste the moon cut-outs in the right order.

Extension Activities—

Moon Characteristics

- Ask the following questions to help students learn more about the Moon:
⇒What is the moon made of?

The moon is made up of rock and dust.

- ⇒Could humans live on the Moon? *No, there is no air or sign of life.*
- ⇒Why can we see the moon? Why is the Moon bright at night? *The moon has no light of its own. It is bright in the night sky because it reflects the sun's light. Our moon looks big and bright because it is so close to Earth compared to the faraway stars and planets.*
- ⇒Why is the moon so big? Is it bigger than the stars and the planets? *It is Earth's closest neighbor in space. The moon is 238,900 miles away. It is 1/4 of the size of the Earth and smaller than all the other planets.*

































Explore Day and Night

- Show students the Day and Night World Map at: <http://www.timeanddate.com/worldclock/sunearth.html>. Explore different days and times and see how the map changes.

Moon Phase Calendar

- Work with students over the period of a month to draw the moon each day. Have them create a moon phase calendar of the month. Ask parents to

assist you in this activity by having their child look at the moon when it is visible. Lastly, have students share their observations about the moon and make sure to point out that while the Sun is only visible during the day, the moon is visible during both the day and night.

April 2009						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						
						
						
						
						

An example of a moon phase calendar for April 2009.

Vocabulary

Sun: The closest star to Earth, made of burning gases.

Moon: A large round rock that moves around the Earth once a month.

Earth: The planet that humans live on.

Sources—

Day and Night Activity inspired by: Kindergarten Science: Unit 10: Changes in Earth and Sky. http://www.rapides.k12.la.us/Tech_Resources/Kindergarten/unit%2010/Science%20Comprehensive%20Curriculum%20Unit%2010%20Kindergarten.doc. Accessed on 16 April 2009.

Carle, Eric. *Papa, Please Get the Moon for Me*. Saxonville, MA: Picture Book Studio, 1986.

Day and Night World Map. <http://www.timeanddate.com/worldclock/sunearth.html>. Accessed on 16 April 2009.

Images—

All Images accessed on 16 April 2009.

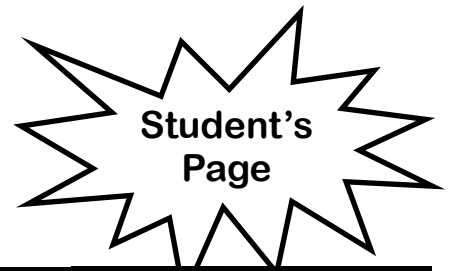
Full Moon: <http://apod.nasa.gov/apod/ap990419.html>

Moon phases: <http://storytime-out.blogspot.com/2008/02/lunar-lessons.html>

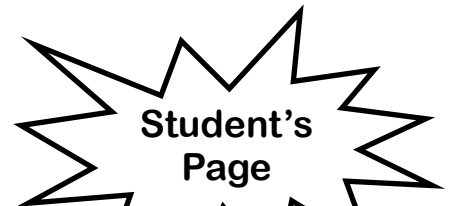
Day and Night World Map: <http://www.timeanddate.com/worldclock/sunearth.html>

Moon Phase Calendar: http://www.moonconnection.com/moon_phases_calendar.phtml

Moon Phases



Moon Phases

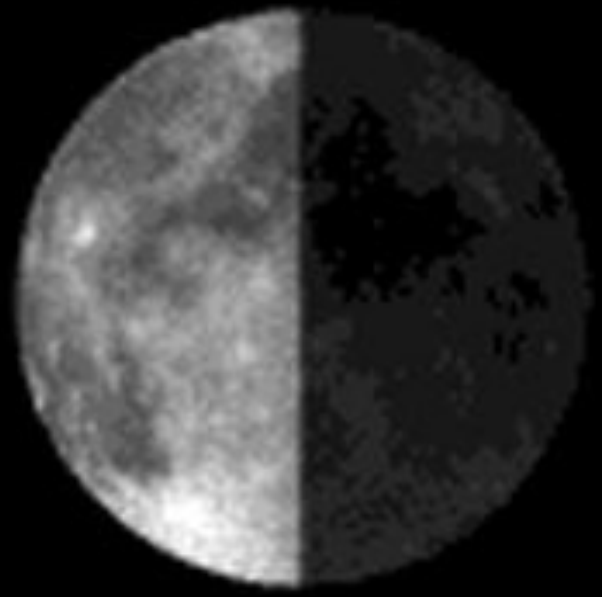


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