

The shape of the moon – 11/5/07 (4th grade)**Expected Time: 20-30 minutes****Objectives:**

- Students will be able to demonstrate the cause of various moon phases by participating in an experiment using a ball to represent the moon and a provided light source.
- Students will be able to make observations about the effect of light on the moon, and will be able to write at least one observation they made from their experiment in their science notebooks.
- By the end of the lesson, students will be able to verbally state that the moon does not change shape, but the amount of light from the sun affects what we can see from Earth.

Materials:

- Powerpoint presentation
- 3-5 playground balls
- Science workbooks
- Sun/lamp

Launch: (5-7 minutes)

*Begin with a short review of prior knowledge about the moon that students have gained through other lessons. Use the 1st slide to start with the question, “Does the moon change shape?” (Yes, we’ve seen crescents, half moons, full moons, the eclipse happened and took the moon away, etc.). After establishing that the moon does change shape, “Does the moon change shape in one night?” (No, at least not that we can see.) “Why do you think the moon changes shape?” Students may have difficulty trying to put the concept into words – guide them to think about the effect of the sun as a light for the moon, or to think about shadows (i.e. If I stand facing the sun, is my back going to be lit?)

*Show students the 2nd slide, illustrating the phases of the moon – further reinforcing that the moon changes shape. How many days does it take for the moon to be the same shape again? (28-29, depending on counting). Let students know that they don’t need to remember the names of the phases.

*3rd slide: Go through the information with the students, defining what changes (amount of light, not shape), cycle takes 28 days, to quickly review what our discussion covered.

Investigate: (15-20 minutes)

If cloudy outside, use a lamp to represent the sun.

(5 minutes) *Tell students that we are going to try an experiment to see the changes light has on the moon. Hold up the ball, just above head but not out of sight, and stand in front of the lamp (tell students the lamp represents the sun). Ask students what the ball represents (the moon), and what you represent (the earth). Stand towards the back of the class and hold the ball up in front of the light so students can see. Ask students to only think about the side of the ball they can see. Is it lit up? (No, not facing the sun). What moon phase does this match? (New moon). What if I turn to the side? (Half the ball is lit up).

(10-15 minutes) *Tell students that they are going to have the opportunity to try this experiment for themselves. Remind them to turn, then pause and observe what they see. Why will spinning in circles not work? (You can’t see anything). When you finish, hand the ball off to someone else in the group and then write a sentence or two about your observation in your notebook.

Closure: (5 minutes)

*Ask students to share an observation they have written in their notebooks about this experiment. Review: Does the moon actually change shape? (Did our ball stop being a sphere?) What did change? (The amount of light).

*If there is extra time, go back to slide 3 and allow students time to copy down the information into their notebooks. Make sure that students are aware they will not be tested on this information, but it’s good to add to their knowledge.

Assessment:

- Observe students during class discussion and the experiment. Students should be able to answer the questions and participate in discussion, as well as listen to the instructions in order to carry out the experiment effectively (cooperating to share the ball, making observations of what they see).
- Check student workbooks during the class period. Students should have at least one observation written in their books, and also if there was time – students should have the notes from the powerpoint presentation written down.

Lesson Success

_____ **Excellent** _____ **Good** _____ **Fair** _____ **Flop**