

Name _____ Due Date _____ Period ____ Partner's Name _____

The Rotation of the Moon

You may have noticed that the same face of the moon is always facing Earth. In fact, we never see the other side of the moon, and we knew nothing about its nature until a spacecraft took pictures of it in 1959. In this activity, you will use a model made with a toothpick, a marshmallow, and a light bulb to investigate how the moon rotates

Why do we only see one side of the moon's surface?

1. Obtain a toothpick, a marshmallow, and a marker. Place the toothpick through the center of the cylinder portion of the marshmallow. The toothpick will represent the rotational axis of the moon. (Like the North and South poles on Earth)

2. Look at the image of the full moon (Figure 1). On one of the round sides of the marshmallow, sketch a few of the four major craters or seas that face Earth. Now draw an arrow next to the toothpick in your marshmallow moon, as shown in Figure 2.

3. Your teacher will set up a strong light source, which will represent the sun. Face the light source and hold the marshmallow about 50 cm away from you with the marked face toward you. You are the observer from Earth looking at the moon. Note toward which side of the classroom the arrow on top of the marshmallow points. Move the marshmallow in a counterclockwise direction 90° , keeping the marked face toward you. You will have to rotate along with the moon as you move it. Note in which direction the arrow is pointing.

4. Repeat this procedure for 180° , 270° , and 360° , or back to 0° .

5. Repeat the experiment with a lab partner taking the place of the marshmallow. Instruct your lab partner to stand between you and the light source, facing you (new moon position). Your lab partner's face is the side of the moon that always faces Earth; you are the observer on Earth. Tell your lab partner to move to first quarter position (counterclockwise 90°), still facing Earth.

Continue through full moon and last quarter to the next new moon. Switch roles and repeat.



Figure 1



Figure 2

6. Discuss your results with classmates. Then answer these questions.

A) It takes 28 days for the moon to revolve around the Earth. What is the rotation rate of the moon?

B) What in your observations led you to this conclusion?

C) Why does the same side of the moon always face the earth?