What Causes the Tide to Change?
Classroom Activity

Tides are the rising and falling of the ocean water. The gravitational forces of the sun and the moon are the primary causes of the tidal changes. Because the moon is closer to Earth, it has a stronger gravitational pull than the sun. The following demonstration and activity illustrate the effects of only the moon on the tides.

SYNOPSIS

This activity is comprised of two parts. In the first part, the teacher will demonstrate the tides to the class. In the second part, students will play a game to experience how the moon's gravitational pull creates the tides.

OBJECTIVES

Students will be able to:

- explain how the moon's gravitational pull creates the tides

VOCABULARY/CONCEPTS

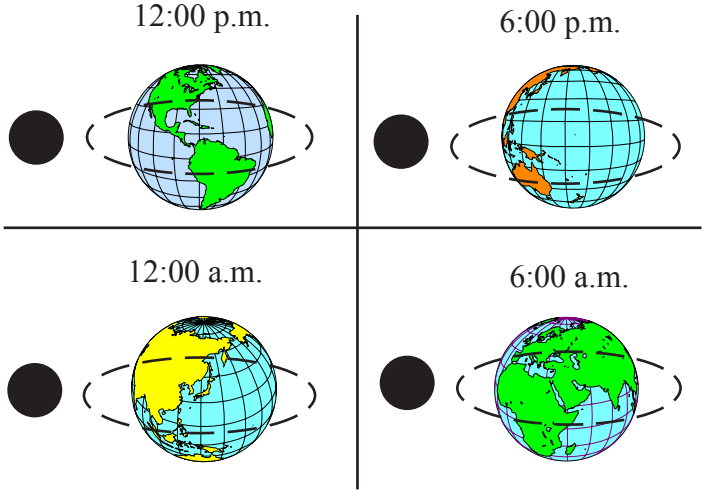
- tides
- gravitational pull

MATERIALS

- globe
- string or chalk
- large piece of cloth or a bandana

PROCEDURE - Part 1

1. Use the "What Causes Tides?" background information in conjunction with the following diagrams and a globe to demonstrate to the students the effects of the moon's gravitational pull on Earth's water. In the diagram, the dark circle to the left of Earth represents the moon. The pooling of the water created by the gravitational pull is represented by the arcs on the quarter closest to the moon and the quarter furthest away from the moon.



2. Place the cloth or bandana flat and open on a table. Tell the students that the table represents Earth, the cloth represents the water, and your hand symbolizes the moon's gravitational pull.

3. Pull the cloth from the center. Ask the students whether the tide at the center of the cloth is high or low tide. The "bulge" which forms represents the high tide. Tides are merely the pooling of water on the surface of Earth.

PROCEDURE - Part 2

1. Create a large circle on the ground with string or chalk.

2. Have the students stand on the circle outline. Tell them that the circle represents the water on Earth.

3. Choose one student to represent Earth and another the moon.

4. Place the Earth student in the center of the water circle. Place the moon student on the outside of the circle.

5. Have the earth student slowly spin counterclockwise to show the rotation of Earth (from west to east). Because the water is on the surface of Earth, the water students should also walk counterclockwise around the circle (see Figure 1).

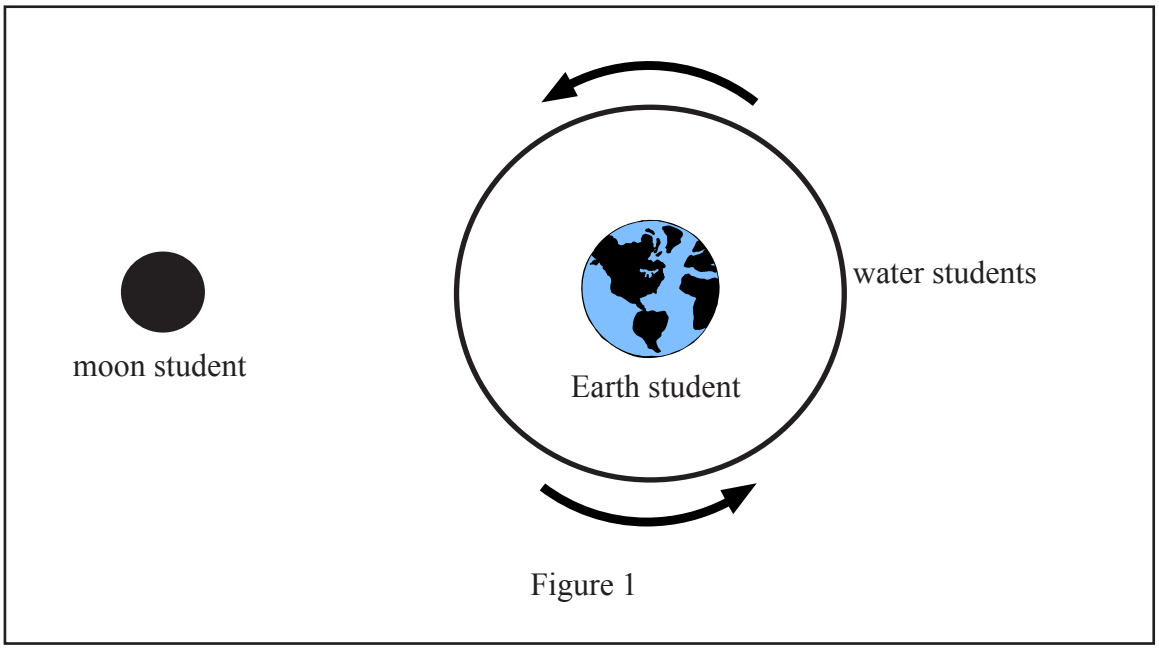


Figure 1

PROCEDURE (continued)

6. As the water students pass the moon, have them step away from the circle toward the moon. The water students on the opposite side must also step away from the circle. As the students continue circling away from the moon, they should step back into the circle. (The movement of the students should look like an oval; see Figure 2).

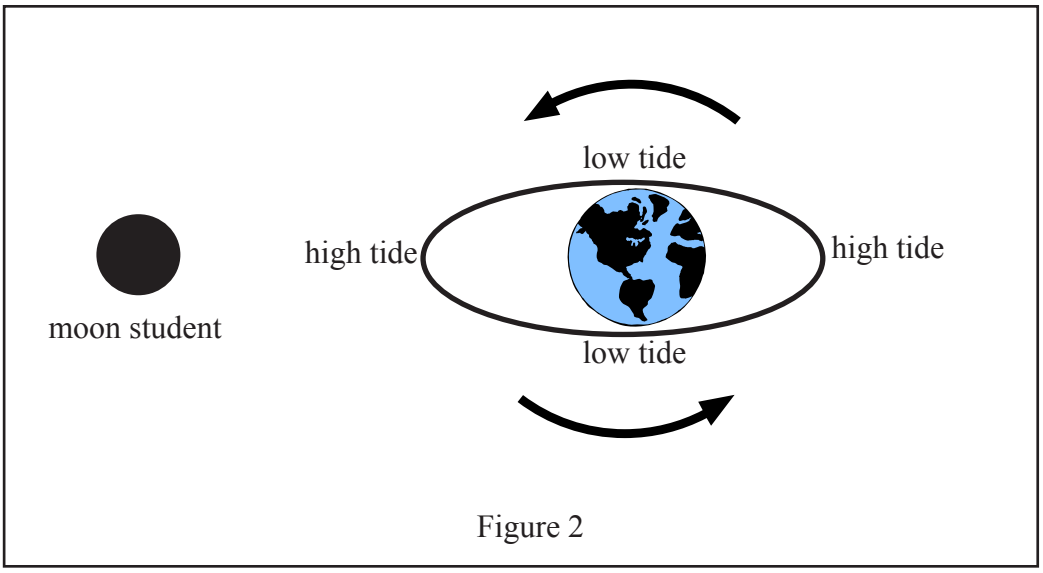


Figure 2

7. Tell the students their movement away from Earth represents the pooling of water or high tides. The students on the other two quarters of the circle represent the low tides.

CHECK FOR UNDERSTANDING

- Have the Earth and water students continue to rotate and step out of the circle at the appropriate quarters of the circle. Have the moon student say "Freeze." When this happens, all the students should freeze where they are. Have the Earth student select a water student to explain which tide he/she represents (high or low) and what is causing it.