

Lesson Plan Seven – Wobbling in Circles

Standard 01: Students will understand that the appearance of the moon changes in a predictable cycle as it orbits Earth and as Earth rotates on its axis.
Objective 2: Demonstrate how the relative positions of Earth, the moon, and the sun create the appearance of the moon's phases.
Intended Learning Outcomes: <ol style="list-style-type: none">1. Use science process and thinking skills3. Understand science concepts and principles6. Understand the nature of science

**Standard
I**

**Objective
2**

Background Information

The rotation of an object is when it spins on its axis. The revolution of an object is when it circles around another object. Earth takes about 24 hours to complete one rotation. Earth takes 365 $\frac{1}{4}$ days to make a complete revolution. It takes the moon about 28-30 days to make one revolution, and the same amount of time to make one complete rotation. Therefore, the same side of the moon is always facing Earth. The revolution of the moon around Earth is the reason we have moon phases.

Pre-Assessment/Invitation to Learn

1. Ask students if they know the difference between a rotation and a revolution.
2. Have another student demonstrate the counter clockwise rotation of Earth.
3. Have another student demonstrate the counter clockwise rotation of the moon while it revolves around Earth. The first student (Earth) should still be rotating. Make sure the moon is only rotating once for every revolution. The same side of the moon should always be facing Earth. Explain to students that the revolution of the moon around Earth is why we have moon phases.

Instructional Procedure

1. Explain to the students that Earth revolves around the sun, just as the Moon revolves around Earth.
2. Remind students that Earth and the moon rotate counter clockwise as they orbit the sun. The moon revolves around Earth as Earth is revolving around the sun.
3. Assign three students to represent Earth, the moon, and the sun. They should hold the right word cards.
4. Have students demonstrate the rotation and revolution of Earth and the moon around the sun for the class. Make sure they rotate as they revolve.
5. Put students into groups to repeat this activity. Have students play the different roles of the sun, the moon, and Earth.

Materials

- Word cards for Earth, Moon, Sun, planet, and 2 stars (for each group.)
- Large open area

6. Bring the students back together as a class.
7. Assign students again to be the sun, the moon, and Earth, but this time add two stars and one planet out in the distance.
8. Have Earth slowly turn from day to night. Have them pay special attention to the planet and stars. What do they appear to do? Earth should notice that the planet and stars appear to move across the sky as they are rotating. Point out that although the other planets are revolving around the sun, it is because of Earth's rotation that the planets appear to move across the sky. The same is true with the stars in the sky. They appear to move because of Earth's rotation.
9. Again, break students into groups to repeat the activity so all can understand that stars and planets appear to move across the sky based on Earth's rotation. Each student should have the opportunity to play Earth.

Assessment Suggestions

- Observe groups demonstrating the activity to make sure the concepts are understood.
- Journal Activity: Have students write a paragraph comparing a revolution and a rotation. Have them explain the movement of Earth and the moon in space, in addition to the apparent change in position of the planets and stars.

Reference to Assessment Section:

	Multiple Choice	Constructive Response	Performance Test
Unit Test	1, 7, 8, 9, 10, 11	3, 4	

Resources

Videos –

- [The Moon](#), Lucern Media, 1994
- [The Moon](#), Staton Films, 1983

