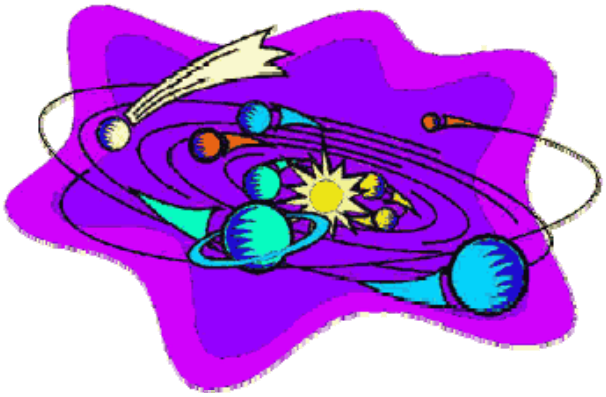
PATTERNS IN THE SKY-GRADE 3



OBJECTIVES:

1. Patterns in the nighttime sky are caused by rotation and revolution.
2. Learning why the Moon changes in the sky.

VOCABULARY:

Axis-an imaginary line through the center of an object around which it rotated while spinning.
Orbit - the curved path of an object around a point in space.
Revolution - the motion of one body around another.
Rotation - the turning of a body on its axis.

PROCEDURE:

MATERIALS: placemats, Styrofoam Earth and Moon, cut bookmarks of Moon's surface

Concept to review: Rotation and Revolution

The entire Universe moves, including galaxies, stars, planets, and moons.

The key concept to emphasize is that the Earth revolves around the Sun (orbits around a central point). The Earth rotates on its axis and revolves around the Sun. The Moon rotates on its axis and revolves around the Earth. Stars and planets also rotate on their axis and revolve around the Sun. Movement in the universe allows us to see patterns in the sky from constellations changing position to the phases of the moon. These patterns help us to visualize the motion.

Note that the words in English sometimes confuse children. When we go through a "revolving door" we are really rotating around an axis. When we play volleyball we "rotate," but we are actually revolving.

Rotation is a little more involved because students need to understand an axis. An axis is an imaginary line around which an object spins on itself. The Earth's axis is an imaginary line that runs through the north and south poles. You can use a basketball spinning on a finger as an example of rotation.

1. Use the first few slides of the Universe Slideshow to show the movement of the universe. Even thought there is all this movement we can still see patterns in the sky.
2. Ask the students what evidence suggests to us that the Earth moves. Explain how the passing of day and night are cause by rotation.

Activity 2. Stars and Constellations

Constellations are geometric patterns of stars and far off galaxies. They are a convenient way to locate objects in the Universe from Earth. Certain constellations can be found by locating one key star in the constellation such as the star Polaris in the constellation Ursa Minor.

1. Read the Bear and the Baby.
2. Using the placemats, name a couple constellations in the northern and southern hemispheres that the students can easily find.
3. Using the workbook and placemats, have students locate the five constellations listed and draw the pattern of each in the space provided. The activity on page 2 (dot to dot) can be done with the teacher at a later time.

Activity 2/3. Phases of the Moon

Moon phases change cyclically as the Moon orbits the Earth. The pattern repeats itself every 28 days, called the Lunar Cycle. The moon shows different phases as the relative position of the Sun, Earth, and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of Earth and a new moon when they are on the same side of Earth. Note that a new moon cannot be seen because it is in the shadow of the Earth.

1. Use the illustration in the workbook to help explain the movement of the moon around Earth. Ask the students where the Sun would be in order to make these patterns.
2. Use the models of the Earth and Moon and have the students stimulate each of the phases of the moon as it moves.
3. Have students color in the moon phases in their workbooks.
4. Give each student a piece of a 1967 Apollo Mission picture of the moon (these are the originals) and have the students make a bookmark. You can have them transfer the phases to the back. Teachers may want to do this after if there is not enough time