

Our Place in Space

Program Summary

Instead of just listening to someone talk about the Earth and the Sun, students will be asked to help solve a crossword puzzle about the sky. Some clues are easier than others.

Starting with ideas as basic as the difference between a star and a planet, one clue builds on another. The answers lead to exploration of the relationship between the Earth and Sun, how apparent size changes with distance, the rotation of the Earth and the effects of gravity (or the lack thereof), and the cause(s) of day and night.

There is a brief segment about constellations and how the sky is a big dot to dot game. From there, students will use their imaginations to take a trip into space to visit the planets in the Solar System and travel beyond the realm of the Milky Way galaxy.

Tennessee Science Standards

See www.adventuresci.com to find specific Grade Level Expectations (GLE).

STANDARD 6 – THE UNIVERSE

Conceptual Strand 6: *The cosmos is vast and explored well enough to know its basic structure and operational principles.*

STANDARD 11 – MOTION

Conceptual Strand 11: *Objects move in ways that can be observed, described, predicted, and measured.*

Objectives

1. Explain the difference between a star and a planet.
2. Describe how Earth's rotation causes day and night.
3. Name a common constellation or make up their own star picture.
4. List three objects that are found in space.

Pre-Visit Activities

1. Discuss the difference between the daytime and nighttime skies. Have students draw day and night pictures. Students can also find and cut out pictures from magazines and identify them as DAY or NIGHT.
2. Discuss how size appears to change with distance using familiar examples such as airplanes, cars, etc.
3. In a darkened classroom with a rotating Earth globe and a bright light, have students observe how light shines on one side of the Earth while the side away from the light remains dark. (A clear light bulb works best.)
4. Ask the class to name objects found in space. Have students look for ways to classify the list or separate it into groups (planets, stars, etc.)

Post-Visit Activities

1. Have students drop 6 to 10 beans onto black construction paper and glue each bean where it landed. Students connect the beans/dots with lines, using chalk or white crayon, to create a picture. Have students name their constellation and tell a story about it.
2. Using a globe, demonstrate the difference between rotation (turning around an axis) and revolution (orbiting/moving around another body). Go outside where pairs of students can model the motions of the Sun and Earth. You

Vocabulary

constellation

day

Earth

galaxy

gravity

night

planet

planetarium

star

Sun

could also have students act out both movements in a large circle with one student standing in the center as the Sun. Groups of three students could physically model the motions of the Sun, Moon, and Earth, showing rotation and revolution all at the same time. Don't forget that the Sun also rotates and be prepared for a dizzy experience!

3. Take the class outside on a sunny day to explore shadows. Have pairs of students draw a chalk outline of each other's shadow and note the time they drew it. Draw their footprints first and then they can more easily return to the same position each time. Go out several times during the day and redraw the outline with students standing in the same spot. Be sure to write the time they made each shadow beside each marking. Discuss how the shadow has changed; size, length, direction of the shadow. Help students draw conclusions about their observations.
4. Assign each student an object in space from the following list: Sun, Mercury, Venus, Earth, Earth's Moon, Mars, Asteroids, Jupiter, Saturn, Uranus, Neptune, Pluto, another star, double star, star clusters, nebula, galaxy.
 - Have students create a representation of his or her object. These could be 2d or 3d using any type of material.
 - Have students line up in order of position moving outward from the Sun. What tricks can be used to remember the order of the planets? After reciting the standard "Mary's Very Eager Mother Just Served Us Nine Pizzas." ask the students to make up their own sentences.
 - Each student could then tell the class two things about their object.
 - Create a scale model that shows the relative distances of the planets from the Sun.
5. Download the monthly star chart from our website. Encourage students to locate the constellations and any planets visible in the evening sky.

Exhibit Connections

Space Chase

- The movement of the earth around the sun can be seen in the Earth-sun orrery in the solar System Survey.
- Students can explore the Solar System Touchscreens to learn more about the Sun and human exploration of Earth's planetary neighborhood.

Resources

Books

A Child's Introduction to the Night Sky
Michael Driscoll, Meredith Hamilton
ISBN-13: 978-1579123666

Everything Kids' Astronomy Book (Everything Kids Series)

Kathi Wagner, Sheryl Racine
ISBN-13: 978-1598695441

Find the Constellations

H.A. Rey
ISBN-13: 978-0547131788

Zoo in the Sky: A Book of Animal Constellations

Jacqueline Mitton and Christina Balit
ISBN-13: 978-0792259350

The Planet Hunter: The Story Behind What Happened to Pluto

Elizabeth Rusch, Guy Francis
ISBN-13: 978-0873589260

Touch the Sun by Noreen Grice a NASA Braille book

Find the Constellations and *Zoo in the Sky* are available from the Nashville Public Library.

Websites

Monthly star charts and related articles
www.SudekumPlanetarium.com

Paper Plate Astronomy
analyzer.depaul.edu/paperplate/

Build a Solar System
www.exploratorium.edu/ronh/solar_system/

How Big is the Solar System?
www.noao.edu/education/peppercorn/pcmain.html

National Space Science Data Center
(up-to-date data about the Solar System)
nssdc.gsfc.nasa.gov/planetary/planetfact.html

Scale models of the solar system
www.vendian.org/mncharity/dir3/solarsystem/