Earth and Space

CONTENT STANDARD: Earth and Space Science

CONTENT TOPIC: Earth and Space Science

CONCEPT: Our solar system is composed of many objects which revolve around a star.

CONTENT OBJECTIVE: To understand the composition of our solar system including the similarities and differences among planets

INSTRUCTIONAL OBJECTIVES: The learner will:

Describe the composition of our solar system.
Recognize the names of the planets in our solar system.
Compare and contrast the nine planets that orbit the sun.
Compare and contrast the Earth and Sun.

OUTLINE OF CONTENT:

I. Composition of solar system
II. Names of planets in the solar system

TIME REQUIRED: ~ 35 minutes

The Sun and Earth Size Comparison

Compared to Earth, the Sun is enormous!

Mass (for the younger students, you will need to explain "mass", i.e. weight)

The Sun's mass is about 333,000 times Earth's mass. An object at the Sun's surface would weigh 28 times as much as it does on Earth's surface!

Connectors

- How much would you weigh at the Sun's surface?
- How does this number compare with the weight of a car on Earth? (Cars and trucks weigh 2000 pounds or more.)

Diameter

The Sun is 1,391,000 kilometers (862,400 miles) in diameter. Earth is 12,742 kilometers (7,900 miles) in diameter.

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Can you picture this difference in size?

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Activity:
We have chosen a penny to represent the size of Earth. You will draw a circle to represent the size of the Sun compared to this Earth-penny. The length of the string has been calculated for you.

Materials:

- yardstick and ruler
- ball of string or twine
- piece of chalk
- 150 pennies

Instructions:

1. Obtain a string approximately 1.5 meters long.
2. Tie a piece of chalk to one end.
3. Measure 104 centimeters from the chalk and make a mark.
4. In an open area, have one student hold the marked point of the string against the floor or ground while another student takes the chalk end with the string taut and draws a circle. (Students are operating as a life-sized compass).
5. When you have finished drawing the circle, have the students take turns; place pennies next to each other until you have made a line of pennies all the way across the middle of the circle (diameter).
6. Observe.
7. Count the pennies used.

MATERIALS:

Picture of a spacecraft and solar system, art paper, magic markers metric rulers.

SET:

Today, class, we are going to describe the composition of our solar system and recognize the names of the planets in our solar system.

INSTRUCTION:

(Show a picture of a "Voyager 2" spacecraft.) This spacecraft left the earth in 1977. It was going to the edge of our solar system. How long do you think it took to get there? (response) Would you like to travel in space? (response) What is in our solar system? (response)

In 1989, Voyager 2 made the first close approach to Neptune. That left Pluto as the only unexplored planet in our Solar System.

(Picture of the solar system for demonstration.) Our solar system includes the sun and all the planets and comets that move around the sun. The nine planets are: Mercury, Venus,

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Earth, Mars, Jupiter, Uranus, Saturn, Neptune, and Pluto. This sentence on the board, may help you to learn the names of the planets. "My Very Educated Mother Just Served Us Nine Pies." Planets are large bodies that revolve around the sun. Let's name the planets as I point to them.

ACTIVE PARTICIPATION:
Split the class into teams of 3-4 students per team.

Relative size of planets with Earth the size of a Penny:

Planet	*Diameter in Centimeters*	*Diameter in inches*
Mercury	0.7 cm	0.3 in.
Venus	1.8 cm	0.7 in.
Earth	1.9 cm	0.75 in.
Mars	1.0 cm	0.4 in.
Jupiter	20.8 cm	8.2 in.
Saturn	17.4 cm	6.8 in.
Uranus	7.0 cm	2.8 in.
Neptune	6.8 cm	2.7 in.
Pluto	0.3 cm	0.1 in.

1. Use the above relative figures of size to make a representation of the solar system. Use metric measurements to have children draw a picture of each planet, working in small groups. Use art paper, markers, and crayons.

Relative distances from the Sun:

Planet	*Distance in Centimeters*	*Distance in Feet*
Mercury	0.4 cm	1/3 ft
Venus	0.7 cm	2/3 ft.
Earth	1.0 cm	1 ft.
Mars	1.5 cm	1 1/2 ft.
Jupiter	5.2 cm	5 ft.
Saturn	9.5 cm	9 1/2 ft.
Uranus	19.2 cm	19 ft.
Neptune	30.1 cm	30 ft.
Pluto	39.4 cm	39 ft.

2. Use the above relative figures of distance to make a representation of the solar system. Use metric measurements to have children draw a mural of the solar system, working in small groups. Use art paper, markers, and paints.

CLOSURE:

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You have explored the size comparison of Earth and Sun using measured values and by making a scale model.

Write the names of the planets, in order from the sun, using the sentence clue on the board. Draw the planets in order from the sun.

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