A Sun/Earth Comparison

Overview:

Students develop a comparative perspective between the size of the sun and planet Earth.

Objectives:

The students will:

- determine that the diameter of the sun is about 100 times larger than the diameter of Earth;
- compare the size and the distance between Earth and the sun through mathematical exercises; and
- conclude that the sun is the central and largest body in the solar system.

Materials:

- Clay balls (1 centimeter in diameter)
- Large butcher paper
- String
- Graph paper
- Meter stick
- Calculator
- VISUAL AID: "Model Sun"
- STUDENT WORKSHEET: "A Sun/Earth Comparison"
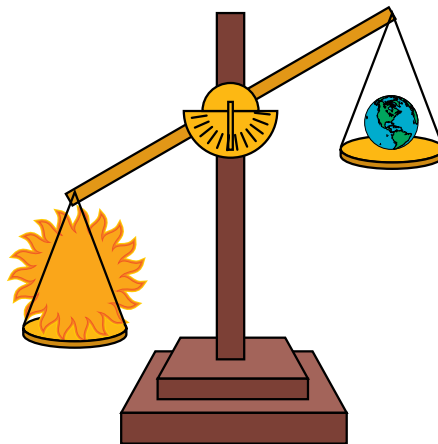
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Activity Procedure:

1. Explain that Earth and the eight other planets in our solar system revolve around the sun, which is the largest body in our solar system. The sun is 865,000 miles (1,393,000 kilometers) in diameter, which is wider than 100 Earths positioned side by side.

2. Organize students into small groups of three or four, and hand out clay, rulers, butcher paper, graph paper, string and calculators.

3. Ask students to make a clay ball about 1 centimeter in diameter. This ball will be a model Earth.

4. Write the following statement on the chalkboard: "The diameter of the sun is 100 times larger than the diameter of Earth." Explain that "diameter" is the distance across a circle through the center.

5. Show the VISUAL AID: "How to Draw a Model Sun." Ask students to draw a paper model sun that is 100 times larger than the clay Earth. Students must multiply 1 X 100 to figure out the diameter of the sun model, then draw a line 100 centimeters long in the middle of a wide piece of butcher paper.

6. Ask students to mark the midpoint of the 100 centimeters line with an "X".

7. Ask students to cut string to just over 50 centimeters in length and tie it to a pencil to make a string compass.

8. Ask students to put the free end of the string compass on the midpoint and hold it down, then stretch the string and use the pencil to draw a circle around the midpoint.

9. When students finish, ask them to figure out how far apart their models need to be to reflect the distance between Earth and the sun at this scale. Hand out the STUDENT WORKSHEET: "A Sun/Earth Comparison."

10. When students finish their worksheets, place the paper sun and clay Earth 108 meters apart.
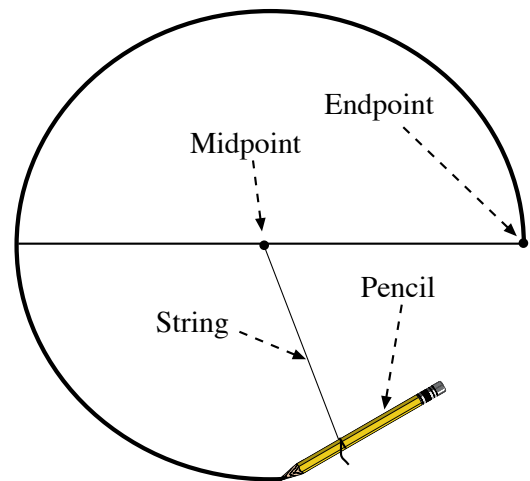
Answers to Student Worksheet:

1. *The sun's diameter is 100 times larger than Earth's diameter.*

2A. *13,930 kilometers/centimeters = paper model sun scale*

2B. *10,768.12 centimeters (rounded to 10,768 centimeters) = distance between clay Earth and paper sun models*

2C. *107.68 meters (rounded to 108 meters)*

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1. Fill in the blank: Most scientists agree that the diameter of our sun is _____ times larger than the diameter of Earth.

2. To find the distance between clay Earth and paper sun models, use the following formulas:

A. Formula for Finding the Scale of the Diameter of the Paper Sun

__**1,393,000**__kilometers **÷** _____ centimeters **=** _____kilometers/centimeters
diameter of the sun   *diameter of paper model sun*   *paper model sun scale*

B. Formula for Finding the Distance between Clay Earth and Paper Sun

__**150,000,000**__ kilometers **÷** _____kilometers/centimeters **=** _____centimeters
average distance between   *paper model sun scale*   *distance between clay Earth*
real sun and Earth   *and paper sun*

C. Formula for Converting Centimeters into Meters

_____centimeters **÷** 100 **=** _____
distance between clay Earth and paper sun   *meters*