Student Data Sheet

Using the diameter of a ball, create a scale Earth-Moon model to accurately show the size of and distance between the two bodies. Use ratios between the actual and scale measurements to calculate size and the Earth-Moon distance. Be sure to show your work.

Materials

- One ball
- Modeling clay
- Rulers or meter sticks
- String

Distance from Earth to the Moon: 384,400 kilometers (238,855 miles)
Earth diameter: 12,742 km (7,918 miles)
Moon diameter: 3,475 km (2,159 miles)

Instructions

1. Measure the diameter of the scale Earth ball.

   Diameter (D): _____ cm

2. Use ratios to calculate the diameter of a scale Moon ball.

   _____ cm

3. Make a scale Moon out of clay. Measure the diameter to verify it is the correct size.

4. Use ratios to calculate the scale distance to the moon.

   _____ cm

5. Add 2 cm to the scale distance and cut that length of string. Tape the string to the scale Earth ball, covering 2 cm with tape where it attaches to the ball. Extend the string from Earth and place the Moon at the end of the string to complete your scale Earth-Moon model.

6. The scale of your model can be found by comparing measurements in your model with actual measurements. Use the diameter of Earth to find the scale of your model in kilometers per centimeter.

    Scale: _____

7. When all groups have completed their scale models, line up from fewest to greatest kilometers per centimeter.

8. What would Mars' diameter (6,779 km) and circumference be at the scale of your model?

    Diameter: _____

    Circumference: _____

9. At their closest, Mars and Earth are about 78,000,000 km (49,000,000 miles) apart. At their farthest, they are about 378,000,000 km (235,000,000 miles). At the scale of your Earth-Moon model, what is the closest and furthest Mars would be?

    Closest: _____

    Furthest: _____