EARTH/MOON COMPARISONS

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Students will understand: the use of models to understand relationships; comparative sizes and distances of the Earth and the Moon; the concepts of diameter, distance, and volume.

Students will be able to: work with group members to arrive at a prediction; explain relative sizes and distance of the Earth and Moon.

1. Diameters

   a) Review the definition of diameter.
   b) Using construction paper, make a circle with a 12.8 cm diameter* and draw a diameter line across it; label it "Earth."
   c) Put the circle on the board or the wall; say to students, "If this circle represents the diameter of the Earth, how big would a circle representing the Moon be?"
   d) Give the students some time to discuss this in their groups of three or four.
   e) Have one member from each group draw a circle on the board to represent their prediction of the Moon (or, have them cut one out of construction paper).
   f) When all predictions are on the board, observe and discuss them.
   g) Then show the students a 3.5cm circle labeled "Moon." Show how the Moon fits across the Earth's diameter about four times. The ratio is approximately 4 to 1 – it takes four Moon diameters to equal one Earth diameter.

*Scale: 1 cm = 1,000 km; 1:100,000,000

2. Distance

a) Refer back to the circle representing the Earth on the board.
b) Say to the students, "If this shows Earth's position in space, how far away is the Moon?"
c) Have students make group predictions; one student from each group draws their Moon on the board.
d) Observe and discuss the predictions.
e) Using a meter stick, measure 383 cm away from the Earth and tape the Moon circle at that point (or, move the Earth circle 30 times away from it original position). The Moon is almost exactly 30 Earth diameters away from the Earth.

3. Volume

a) Review the concept of volume.
b) Give each group a piece of clay and have them form 50 spheres of equal size, using all of their clay.
c) Ask students to decide how to model the volumes of the Earth and the Moon; how many spheres of the 50 would represent the Earth and how many the Moon? They must use all 50 spheres.
d) Have the students loosely clump together the spheres of their models.
e) Have each group display their models on one table.
f) Observe and discuss the models.
g) Show the correct relationship; one sphere of clay represents the Moon's volume and the other 49 represent the Earth's.

Evaluation: Review the three relationships studied. Have students copy and complete the following:

1. The Earth's diameter is _____ times greater than the Moon's.
2. The distance between the Earth and the Moon is equal to _____.
3. Earth's volume is _____ times greater than the Moon's.