



Handout -----A Model of the Earth and Moon – Making a scale model

1. The Ratio of the Earth to the Moon

The diameter of the earth is about 12,756 km (how many miles? There are 0.621371192237 miles in a km).

If you could measure from one side of the earth through the center to the other side, it would be 12,756 km. If you did the same thing for the moon, the measurement would be 3476 km (how many miles?).

What is the ratio of the diameter of the earth to the diameter of the moon? How did you determine this value?

Answer: About 3.7. That means the diameter of the earth is almost 4 times the diameter of the moon. If you have a balloon, measure its diameter. A model of the moon to go with the balloon would have to be about $\frac{1}{4}$ the size of the balloon.

2. How Big Should the Model Parts Be?

That would mean a nine inch diameter balloon would need a moon that was about $2\frac{1}{4}$ inches across, a little smaller than a tennis ball. Make a model of the moon that is $\frac{1}{4}$ the size of your balloon using Playdoh.

How was the value of the size of the moon determined?



3. How Far Apart Are The Earth and Moon?

Let's determine how accurate you were in guessing the distance between the earth and moon with your model.

The moon is about 384,000 km (how many miles?) from the earth.

Express the value in scientific notation and explain how you changed from standard form to scientific notation (See Handout on scientific notation).

Scientific Notation: 3.8×10^5

How can you determine the circumference of the earth? (What assumption are you making about the shape of the earth?)

What is your answer? _____

The circumference of the earth is about 40,090 km (how many miles).

How does the measurement around the earth, its circumference, compare with the distance to the moon (what is the ratio)? What is the value?



5. How Far Apart Should Your Model Parts Be?

How can you use this value to determine the distance for your model? Cut the string to represent the distance.

6. Finish the Model

Now put your moon and earth model together. Are you surprised at the model? Why or why not?

Source: http://www.espsciencetime.org/student_life.cfm?subpage=295515