Using Your Head—Making a Model of the Sun, Earth, and Moon system

In this activity you will make another model of the Sun-Earth-Moon system, this time using the size of your head to represent the size of the Sun.

1. Calculate the diameter of your head.
   a. With a partner, use a piece of string or a measuring tape to measure the circumference, C, of your head.
   b. To determine the diameter, D, of your head, divide the circumference of your head by π (3.14).

$$D = \frac{C}{\pi}$$

   Diameter of my head = _____ (Don't forget to write what units of length you're using.)

2. Use the diameter of your head and the actual diameter of the Sun to determine the scale for your model. Show your calculations below and check your scale with your teacher:

3. Using your scale, calculate the scale size for each blank spot in the data table below:

Object	Actual Diameter	Scale Diameter	Actual Distance	Scale Distance
Sun	1.4×10^6 km		To Earth = 1.5×10^8 km	
Earth	1.3×10^4 km		To Moon = 3.8×10^5 km	
Moon	3.5×10^3 km		To Earth = 3.8×10^5 km	

   Use space below to write down any calculations that you make and fill in the data table above.

4. Make a scale model of Earth and the Moon with Play-Doh or as a drawing on a piece of blank paper. Use your scale diameters and distances.

5. Construct your model

    a. In an area that will accommodate your scale distances (classroom, hallway, or gym for example), find and mark (with masking tape) where you will stand as the Sun in the model.
    b. Place the scaled models of Earth and the Moon at their proper distances away from your location.

Pause and Reflect

6. Astronomers sometimes refer to Earth as a sand grain floating in the void of space.

    As the Sun in your model, can you see Earth (with your eyes)?

    Can you see the Moon?

7. About how many Suns (arranged like beads on a string) will fit between the Sun and where the Earth is in its orbit? (You might need a calculator for this.)

8. About how many Earths (arranged like beads on a string) will fit between the Earth and where the Moon is in its orbit? (You might need a calculator for this.)