# The Size of Things

**Objective:** To get an intuitive feel for the size of the universe

**Requirements:** Rulers, calculators

We’re going to build a scale model of the solar system and environs. To do this, we have to decide on a scale, and then determine what the sizes of and distances to each of our objects will be. Each group will be assigned one of more of the following:

1. Venus
2. Earth
3. Mars
4. Jupiter
5. Saturn
6. Uranus
7. Neptune

We’ll do the Sun and Mercury together as an example. We are going to do the distances and sizes using the same scale, so we can get a good feel for how big this place is where we live. To set the scale, we will use the smallest planet in the solar system, Mercury. Mercury’s diameter is 4879 km. We will represent Mercury by the smallest circle it is easy to draw, one with a diameter of 1 mm. So in our model, every 4879 km in the real world = 1 mm in the scale model.

We’ll use the Sun as the starting point for our model, so you’ll need to search for the diameters and orbit sizes of each of your objects. So find the scaled diameters and distances using the Mercury scale factor.

Draw a circle on a piece of paper scaled to the size of each object and cut it out. We will then place our papers at the appropriate scaled distances.

***Questions***

1. Find, on a map, where each of the following objects would have to be placed, and the appropriate size of circle to represent it.

1. Pluto
2. Oort Cloud comet
3. Proxima Centauri

It will be handy to use Google Maps to find a point that is far enough away to represent the scaled distances. You can use this procedure to do so:

To measure the distance between two points:

On your computer, open Google Maps.

Right-click on your starting point.

Select Measure distance.

To create a path to measure, click anywhere else on the map.

At the bottom, you can find the total distance in miles (mi) and kilometers (km) between those two points.

To move a point or extend the path, click and drag the point. To remove a point, click it.

2. How would you describe the size of the solar system to a friend who is not in this class? How about the size of the universe?

3. How did making this model change the way you visualize the solar system?

***Discuss your results with your instructor at this point***