**Scale of the Solar System**

When we want to look in detail at something very large, like our solar system, we use what we call a **scale model**. We imagine that the solar system has been scaled down to something small enough to deal with, and then look at the details of it – in this case, the sizes of the planets compared to each other and to the sun, and the distances between the sun and the planets on the same scale.

To do this, we have to decide what **scale** we're going to use. In this case, we're working with a model sun that is 100 mm (10 cm) in diameter. The real sun is actually 1,391,900 km in diameter! Knowing these two numbers, we can calculate the **scale factor** for our scale model. Consider this:

real diameter of the sun  scale factor = diameter of “scale model” sun

With our numbers, we can rewrite that as,

scale factor = 100 mm  1,391,900 km

1. What do you calculate the scale factor should be? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mm per km. Copy this number into the blank above Table 1, on the back of this page. (For the following instructions for Table 1, the figures for planet Mercury are done for you, as an example.)
2. Now, we can multiply the actual diameter of each planet by its scale factor, and determine what its size should be in the scale model, in millimeters (mm). Fill in the scaled diameters of each planet in the column labeled “3” in Table 1.
3. Table 1 also gives you the actual distance of each planet from the sun. Multiply this distance by the scale factor you determined in question 1 to get the scaled distances for our model in mm. Write these scaled distances in column “5” of Table 1.
4. There are 1000 millimeters in every meter. Divide the scaled distances that you have in millimeters by 1000 to get the scaled distances in meters. Write your scaled distances in column “6” of Table 1.