Activity 2: Single Page 2- D Solar System Model:

**A. Discuss an AU (Astronomical Unit) ( 93 million miles).**

An AU is the distance from Earth to the Sun. Introduce the term by mentioning known distances with your students using local familiar landmarks. Here are some examples of what might work in the US. If you are using the metric system for your landmarks, please adjust the progression seen below.

**Describe the following distances:**

 1 mile away -

10 miles away –

50 miles away –

100 miles away -

1,000 miles away - New York City, The Gulf of Mexico

2,000 miles away - Chicago to California

4, 000 miles away - Your location to the Earth’s core

8,000 miles away - Your location straight through the Earth to \_\_\_\_\_\_

about 25,000 miles - around the equator (this is a rough estimate for math purposes)

 100,000 miles around the equator 4 times

1,000,000 miles around the equator 40 times

100,000,000 miles around the equator 4000 times

That’s roughly about one AU. (Actually 93,000 million miles)

1. **Draw a scale of planetary distances.**

Use a sheet of computer paper. Draw a line diagonally 30 cm across the paper. Put the sun at one end, mark off the planets at the correct distances (round to the nearest 0.1 cm) using the scale: 1 cm = 1 AU

Place planets along here.

Sun

Using the attached 'Distances of the Planets Table,' students will mark a distance from the sun's edge of 0.4 cm for Mercury. (Round off 0.36cm to 0.4 cm.) Venus would be 0.7cm from the edge of the sun. Continue for the other planets up to Neptune which will be 30 cm from the sun and at the line's end.

Please see an 'Example of a Student 2-D Solar System Model' also found as an attachment.

**C. Discuss the sizes of the planets on your scale.** THESE ARE NOT TO SCALE!

(If you are using the metric system for distances, please adjust the progression seen below.)



If we set 1 cm as 1 AU which is 93 million miles or 93,000,000 miles

Then, 1 mm = 9.3 million miles, that’s 9,300,000 miles

1 micron (that’s 1/1000 mm) then equals 9,300 miles

The Earth is 8,000 miles in diameter - not even a micron in this model!

That’s still hard to understand and very hard to see!

Consider the lead in the mechanical pencils - that’s a size of only 0.5 mm

0.5 mm = 500 microns

In this example, the Earth would be about the size of a period made with the pencil's lead !

In the 2-D Solar system with a 30 cm line, we would not even be able to see some of the planets if we drew them to scale size because they would be too small to see, so in this model, it is important to understand that the distances are to scale, but the sizes of the planets are not to scale.