Lesson 3 – Student Worksheet

Understanding Distances in Space

To make a model of the distances of the planets from the Sun using adding machine tape.

Materials

- Meter stick
- Adding machine tape
- Paper
- Scissors
- Tape

Procedure

1. Complete the table to find out how far away the planets would be from the Sun using different scales. Record your answers in the table.

   In Column 3, find the scale distances if one AU = 1 meter:

   > Example: Mercury

   If 1 AU = one meter, then .4 AU would equal .4 times 1 = .4 m on your scale

   In Column 4, find the scale distances if one AU = 10 cm

   > Example: Mercury

   If 1 AU = 10 cm, then .4 AU would equal .4 times 10 = 4.0 cm on your scale.

2. From your table, how much adding machine tape would you need to model the distance of Pluto from the Sun using one meter as your scale distance?

3. Decide on which scale you will use to model the distances of the planets to the Sun. Will you use 1 meter = 1 AU, or 10 cm = 1 AU? Why?

4. Using the adding machine tape, measure out the different distances needed and label the planets along the tape at the correct distance.

Table: Comparing Distances Using a Scale

Planet Name	Distance to Sun (AU)	Distance to Sun (1 AU = 1 meter)	Distance to Sun (1 AU = 10 cm)
Mercury	0.4	0.4 meters	4.0 cm
Venus	0.7		
Earth	1.0	1.0 m	10 cm
Mars	1.5		
Jupiter	5.2		
Saturn	9.5		
Uranus	19.2		
Neptune	30.1		
Pluto	39.5		

Questions

1. What is an AU?

2. Why did you decide on the scale that you used for your model?

3. Why do astronomers have to use AU's to measure distances in space?