

Planet Distances

Problem: How far apart are the planets?

Materials: Ruler, meter stick, adding machine tape, calculator, pencil, paper

Procedure:

1. Measure a piece of adding machine tape 4 meters long and cut it from the roll.
2. Measure in 2.0 cm from the end of the roll and make a slightly curve line across the strip of paper. Label this the sun
3. From the edge of the Sun, plot the distances to each of the planets in astronomical units (AU). Use the Table 1 below.
4. One astronomical unit (AU) is the distance from the sun to the earth.
5. To figure out the distance of the other planets from the sun (x), use 0.1 m as equal to 1 AU. Convert 0.1 m to cm, this is **Earth's scale distance from the sun**. Now set up your problem as follow:

Table 1

Planets	Distance in AU
Mercury	.39
Venus	.72
Earth	1.0
Mars	1.5
Asteroid belt	2.5- 2.8
Jupiter	5.2
Saturn	9.2
Uranus	19.2
Neptune	30.0
Pluto	39.4

Scaled distance of planet from the Sun calculation

$$\frac{1 \text{ AU}}{\text{Earth's Scale distance from the Sun}} = \frac{\text{planet's distance in AU}}{x}$$

Example: Mercury's distance from sun

$$\frac{1 \text{ AU}}{10 \text{ cm}} = \frac{0.39 \text{ AU}}{x}$$

$$X = 3.9 \text{ cm}$$

6. Draw the planets according to scale. Make Earth's diameter 5mm. Use table 2 to draw the other planets to scale.

Table 2

Planets	Diameter compared to Earth
Mercury	.38
Venus	.95
Earth	1.0 (5mm)
Mars	.53
Jupiter	11.2
Saturn	9.4
Uranus	4.0
Neptune	3.8
Pluto	.18

Calculate scaled diameter of the planets

$$\frac{1.0}{5 \text{ mm}} = \frac{\text{planet's diameter compared to Earth}}{x}$$

Example: Mercury's scaled diameter

$$\frac{1.0}{5 \text{ mm}} = \frac{0.38}{x}$$

$$X = 1.9 \text{ mm}$$