Name: _____

Measuring the Solar System
BUILDING A SCALE MODEL OF THE SOLAR SYSTEM

Terms to Know

Solar System - the Sun and everything that orbits around it, such as planets, their satellites, asteroids and comets

Orbit - the path that one object, such as a planet, takes around a larger object, such as the sun

Rotation - the spinning of an object about its own axis (The Earth's rotation causes day and night.)

Revolution - the motion of an object around another object (The revolution of the Earth around the Sun causes the seasons.)

Astronomical Unit (AU) - the average distance between the Earth and the Sun (1 AU = 150,000,000 kilometers or 93,000,000 miles)

Research

Answer the following True or False questions about the Solar System:

True/False   The Earth is at the center of the Solar System.

True/False   The Earth is the only planet in the Solar System.

True/False   All planets in the Solar System orbit the sun in circular orbits.

True/False   The Earth rotates on its axis once a day.

True/False   The Sun goes around the Earth.

True/False   The moon goes around the Earth.

True/False   The phases of the moon are caused by its motion around the Earth.

True/False   You would weigh less on the surface of Mars than you do on the Earth.

Make the Scale...

Complete the table to determine how far away each planet should be from the sun in your model of the Solar System. Use a scaling factor of 25 centimeters per Astronomical Unit. Once the chart is complete, mark the locations of the planets on your team's model.

Solar System Objects

Object	Diameter	Surface Gravity	Distance from Sun	Scaling Factor	Distance in Model
Sun	1,391,400 km	28 g's	---	---	---
Mercury	4,880 km	0.38 g's	0.39 AU	25 cm/AU	9.75 cm
Venus	12,100 km	0.91 g's	0.72 AU	25 cm/AU	
Earth	12,760 km	1.00 g's	1.00 AU	25 cm/AU	25.00 cm
Mars	6,790 km	0.38 g's	1.52 AU	25 cm/AU	
Jupiter	143,000 km	2.14 g's	5.20 AU	25 cm/AU	
Saturn	120,500 km	0.74 g's	9.54 AU	25 cm/AU	238.50 cm
Uranus	51,100 km	0.86 g's	19.19 AU	25 cm/AU	
Neptune	49,500 km	1.10 g's	30.07 AU	25 cm/AU	
Pluto	2,300 km	.08 g's	39.48 AU	25 cm/AU	

Place the Planets...

Place the planets on your model using the objects provided. Use the information in the table to help you decide which object should represent each planet.

Solar System Model

Object	Actual Diameter	Represented by...
Mercury	4,880 km	
Venus	12,100 km	
Earth	12,760 km	
Mars	6,790 km	
Jupiter	143,000 km	
Saturn	120,500 km	
Uranus	51,100 km	
Neptune	49,500 km	
Pluto	2,300 km	

Questions to Think About

1. What are some things that are incorrect with this model?

2. On which planet would you weigh the most? On which planet would you weigh the least?

3. Mercury is a much smaller planet than Mars, but they both have the same surface gravity. What could cause this?

4. On this scale, how far away do you think the furthest space probe launched by humans is?

5. On this scale, how far away do you think the closest star is?