

Solar System Model

Name _____

Background: Earth, the planet on which we live, as well as the other seven planets orbit the sun at very high speeds. Together, the eight planets, the sun, and other matter orbiting the sun make up the solar system in which we live. The sun, which is actually a star, is the gravitational anchor around which the planets revolve. The planets are arranged in the following order starting with the planet closest to the sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. The distances between objects in the solar system are huge. For example, the distance from Earth to the sun is about 150 million kilometers. Even though it seems like Earth and other planets are huge, they take up a small amount of space in the solar system. In this activity you will create a model of the solar system.

Materials: different color clay or play-dough, large piece of yellow paper, metric ruler, metric tape, large soccer or football field, string, stiff paper, marker, scissors, and hole punch

Directions:

1. In this activity you will make a scale model of our solar system. In a scale model the distances and sizes of objects are proportionally sized relative to one another. In this scale model, one centimeter will represent 500,000 kilometers.
2. First, one group of students will make the sun. Obtain a metric ruler, yellow paper, scissors, and clay or play-dough. Make a circle on the yellow piece of paper that has a diameter of 2.8 centimeters. Cut out the yellow circle. This symbolizes the sun.
3. Look at the chart titled "Planets". In the left column is the name of the planet. In the second column is the actual diameter in kilometers of each planet. In the third column is the approximate diameter of each planet based on the scale we are using.
4. Your teacher will assign each student or group of students a planet. Using the stiff paper and a marker write down the name of your planet. Punch a hole at opposite ends of the paper. Tie the string through each hole so the sign will fit loosely around your neck.
5. Obtain a piece of clay and metric ruler. Roll a tiny piece of clay into a ball to represent your planet. The inner planets such as Mercury, Venus, Earth, and Mars will be so tiny that you will hardly be able to see them. Using the metric ruler, measure the diameter of your planet to match its required size as stated in the third column of the top chart. If it is too big, you will need to take away some clay and then reform the ball. If you have trouble making your planet, ask your teacher for help.
6. Your class will now go outside to place your planets in the model of the solar system.

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7. The first thing to do is to position the “sun” at one end of the field. The sun is 2.8 cm in diameter.
8. Using the chart titled “Planet Distance,” find the position of your planet relative to the sun in the third column. For example, Mercury is 1 meter, 16 cm from the sun. Neptune is 90 meters from the sun. Using the tape measure, carefully measure the distance from the sun to your planet. Stand in position once you have measured the correct distance.
9. Once all the “planets” are in place, take a minute to observe your model solar system. Have everyone hold up their planet. Notice how it is nearly impossible to see the model planets because they are so small compared to the distances between them. Maybe your teacher can take a picture of your class solar system so you can discuss it at a later time.

Planets

Planet	Actual Size Diameter (km)	Approximate Scale Size Diameter (mm)
Mercury	4,900	.10
Venus	12,100	.24
Earth	12,800	.25
Mars	6,800	.14
Jupiter	143,000	2.9
Saturn	120,000	2.4
Uranus	51,800	1.0
Neptune	49,500	.99

Planet Distance

Planet	Actual Distance from Sun	Model Distance from Sun
Mercury	58 million km	1 meter, 16 cm
Venus	108 million km	2 meters, 16 cm
Earth	150 million km	3 meters
Mars	228 million km	4 meters, 56 cm
Jupiter	778 million km	15 meters, 56 cm
Saturn	1,430 million km	28 meters, 60 cm
Uranus	2,870 million km	57 meters, 40 cm
Neptune	4,500 million km	90 meters