

Sidewalk Solar System

Here is a fun way you can use your sidewalk to explore the scale of our solar system. Grab some chalk, a tape measure, some string and head outside to your sidewalk.

Make sure to keep an eye out for car traffic and people walking by while you are measuring out the solar system.



How big are the planets?

Draw the Sun so it fills the width of the sidewalk. The width of sidewalks varies. On my sidewalk I can make my Sun's diameter about 1500 mm. Now draw the other planets on the sidewalk. Use the table below for the sizes of the other planets. If you want to change the size of the Sun, the [Exploratorium](#) has a great online tool to calculate the sizes for you.

Object	Actual diameter (km)	Scaled diameter (mm)
Sun	1391900	1500
Mercury	4866	5.2
Venus	12106	13
Earth	12742	13.7
Mars	6760	7.2
Jupiter	142984	154
Saturn	116438	125.4
Uranus	46940	50.5
Neptune	45432	48.9
Pluto	2274	2.4

Look at how much bigger our Sun is when compared to Jupiter, the largest planet in our solar system. The Sun is a relatively small star when compared to Betelgeuse, a red giant star in the constellation Orion. At this scale, Betelgeuse would be over half a kilometer (562.5 m) wide. Curious about how big that is? You'd have to walk for about 5 minutes to cover the distance. That's one huge star!

Tip: Use a piece of string to help you draw a perfect circle. Tie the string onto your chalk and then measure a length of string the diameter of the Sun. To draw a circle, fold the string in half—this is the diameter of the circle. Hold the $\frac{1}{2}$ length of string in the middle of the sidewalk, hold the string so it is taut and draw your circle.

How big is our solar system?

Use your front sidewalk to create a scale model of the distances between the planets in our solar system.



Draw a Sun that is 5 mm in diameter. At this scale Pluto would be about 21 metres away. Use the table below to measure out the distance for each planet from the Sun.

Object	Distance from Sun (km)	Scaled distance from Sun (m)
Sun - diameter is 5 mm	0	0
Mercury	57950000	.2
Venus	108110000	.4
Earth	149570000	.5
Mars	227840000	.8
Jupiter	778140000	2.8
Saturn	1427000000	5.1
Uranus	2870300000	10.3
Neptune	4499900000	16.1
Pluto	5913000000	21.2

Tip: *1 metre = 1000mm = 100 cm - so at the scale in the table above Mercury would be 200 mm or 20 cm from the Sun.*

At this scale how far away would Betelgeuse be? The actual distance to Betelgeuse is 642.5 light years. A light year is the distance light travels in a year—about 9461000000000 km. To add Betelgeuse to your scale model of the solar system you would need to go to the other side of the world—to Port-aux-Français, Kerguelen, French Southern Territories. Have a look on a map to see if you can find it.

This model includes just the major planets (and Pluto) but there are many other objects in our solar system. There may be a very large planet, Planet 9, in Pluto's neighbourhood. You can help astronomers in their search for Planet 9 by analyzing data from NASA's Wide-field Infrared Survey Explorer (WISE) mission. Join the team of citizen scientists working on [Backyard Worlds: Planet 9 Zooniverse project](#).