

Science with Zoe & Cogs - Experiment 11

Solar System Chalk Trail

The space between the planets in our solar system is huge! This is a good exercise to understand those distances. It's also a good walking exercise!



Things you need:

- Coloured chalk
- A 30 cm ruler
- Tape measure, a meter wheel or good distance estimates
- A friend or adult to walk with

What to do:

- 1** Pick a starting point. Place your 30 cm ruler (school ruler) on the concrete and mark a point at each end. Draw a circle that touches both points. This circle is your starting point on your solar system exploration and represents the Sun.
- 2** Now you need your counting skills. Use your metre counter or tape measure to count out the distances.
- 3** If you have to turn a corner, don't worry. The distances given are the average distance of the orbits of each of the planets. At any one time, a planet could be in any part of its orbit. The idea is to get a picture of the size and scale of the solar system.
- 4** Your first stop is Mercury, 12.5 metres out from the outer edge of the Sun. At a scaled size of just 1 mm, Mercury would be the faintest white dot you could make with your chalk.
- 5** Walk another 11 metres and draw a yellow dot for Venus. Nine metres on draw a blue or green dot the same size (about 2.5 mm) for Earth. Red Mars is about half this size (1.4 mm, a very small dot) another 17 metres from Earth.
- 6** You are now entering the outer solar system and it will take a bit longer to get to the next planet. Count out 118.5 metres to Jupiter, and draw a stripy red and white circle 3 cm in diameter. After 140 metres draw a pale yellow circle a little smaller (2.5 cm) for Saturn – don't forget the rings!
- 7** Uranus is a 1 cm circle another 311 metres past Saturn. Neptune is 350 metres further, and is also almost 1 cm in size. Both planets look blue. You have now walked almost 1 km and reached the most distant planet.
- 8** If you wanted to continue to the edges of the solar system to the dwarf planet Pluto and the Kuiper belt (a ring of icy objects that circles the outer solar system) you could draw a lot of white icy dots another 304 metres past Neptune.

Science with Zoe & Cogs - Experiment 11

Solar System Chalk Trail



What's going on?

As you can see, space is mostly just that – space! Using the same scale, if you were to walk to Alpha Centauri, the nearest star, you would have to travel 8706 km – one-fifth of the way around the Earth!

Table of distances

Body	Size (diameter in millimetres)	Distance to chalk and walk (metres)	Actual diameter (km)	Actual distance from Sun (average orbit radius) in km
Sun	300 mm or 30 cm	Starting point (0)	1,391,900	0
Mercury	1 mm	12.5 metres	4,878	57,909,175
Venus	2.6 mm	23.3	12,103.6	108,208,930
Earth	2.7 mm	32.2	12,756.28	149,597,890
Mars	1.4 mm	49.1	6,780	227,936,640
Jupiter	30 mm	167.7	139,822	778,412,020
Saturn	25 mm	307.9	116,464	1,426,725,400
Uranus	10.1 mm	618.6	50,724	2,870,972,200
Neptune	9.7 mm	969.9	49,248	4,498,252,900

What else do you see?

Use this space to write about, and draw anything else you noticed while doing this experiment.