

Pocket Solar System

Activity

In this activity you will make a model Solar System on a strip of paper. From this you can see how the planets in our Solar System are arranged, and how much further away Saturn is compared to Jupiter! For a full guide on how to do this, see the accompanying video.

You will need

- A piece of A4 paper
- Scissors
- Tape

Activity instructions

1. Take a piece of A4 paper and fold it in half along its longest edge. Fold the paper again so it is now in quarters.
2. Unfold the paper and cut along the folds. You should now have four thin strips.
3. Use tape to join the strips together end to end to create one strip of paper 1.2m in length. Now turn the paper over to the side without the tape.
4. Write **The Sun** at one end of the strip, and **Pluto** at the other.
5. In the middle of the strip write **Uranus**.
6. Half-way between Uranus and Pluto, write **Neptune**.
7. Half-way between Uranus and the Sun, write **Saturn**.
8. Now fold the end marked the Sun up to Saturn. Unfold the paper and write **Jupiter** on this crease.
9. Fold the Sun to Jupiter and mark the **Asteroid Belt** on this crease.
10. Fold the Sun up to the Asteroid Belt, and write **Mars** here.
11. The three remaining planets have to go between the Sun and Mars. In order from the Sun, they are **Mercury**, **Venus**, and **Earth**.
12. If you have completed the Play Doh planets activity, you can now place your planets in the correct places on your pocket solar system.

The Science

In our Solar System the inner, rocky planets (Mercury, Venus, Earth, Mars) are all relatively close together. The gas giants are much further apart from each other. This explains why a spacecraft can get to Mars in a few months but can take a few years to reach Jupiter.

The further out a planet is, the slower it moves. Mercury whips around the Sun in just 88 days, whereas it takes Neptune 165 years to make one orbit. The Kuiper belt objects take even longer, with Eris orbiting only once every 558 years!

The true size of the Solar System is difficult to imagine. Let's say we could fly a normal passenger aeroplane into space. It would take 18 days just to get to the Moon, 29 years to reach Mars and a passenger flight to Pluto would take an incredible 654 years to arrive! Thankfully, rockets are much faster than that but getting to the outer Solar System still takes decades.

For a long time, it was thought that all solar systems would look like ours, with the rocky planets close to the star and gas giants further out. Recently astronomers have discovered many other solar systems around distant stars, some of which look nothing like our Solar System! In these systems we sometimes see giant gas plants very close to the star (called hot Jupiters) and huge, rocky planets (called super-earths) much further out. This means that astronomers have had to change their ideas about how solar systems form.