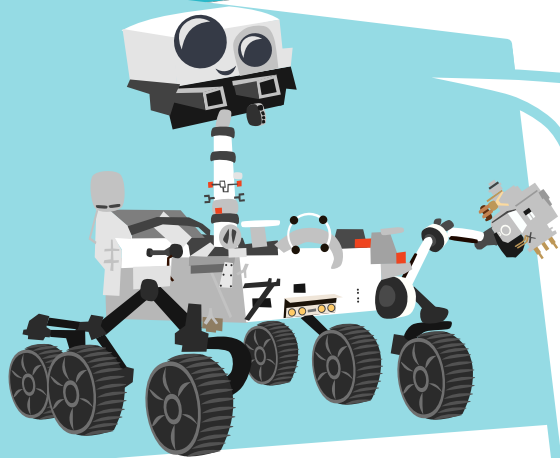
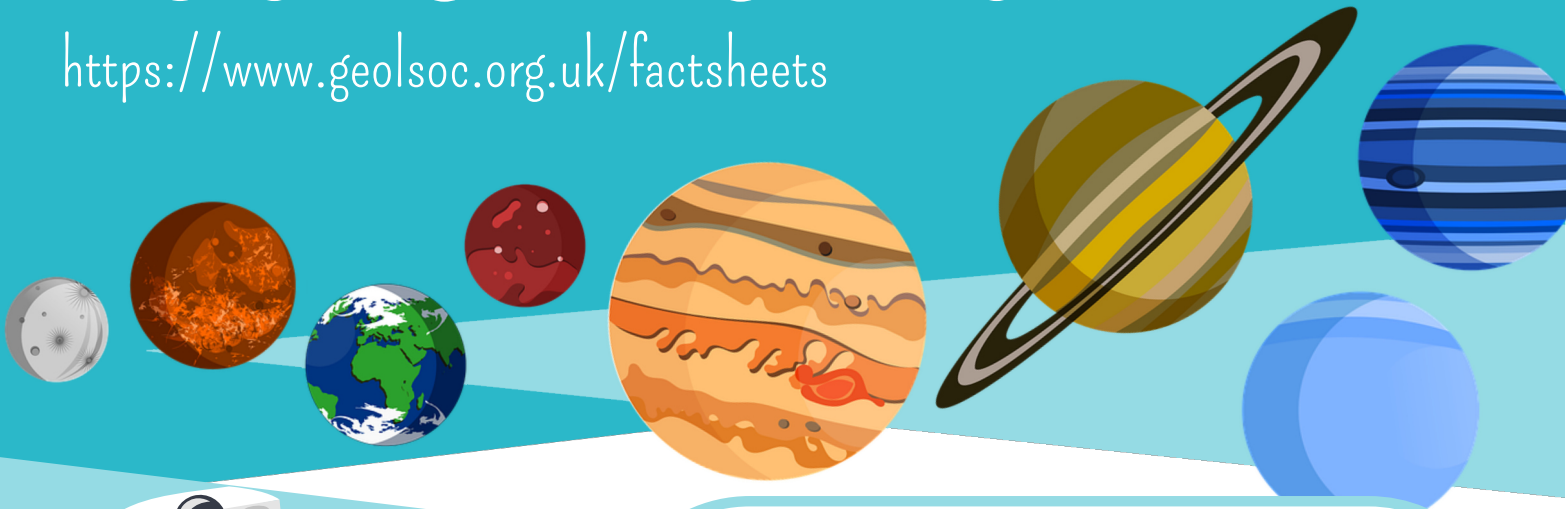


ROCKS IN SPACE

<https://www.geolsoc.org.uk/factsheets>



Hi I'm Percy, a rover designed by NASA to explore Mars. Come along with me as I tell you about the wonders I have seen!

My main mission is to understand the geology of Mars and to collect samples to be brought back to Earth. While exploring Mars I find rocks that might have formed in water. Finding water is important because it could have supported microbial life in Mars's past!

I was launched towards Mars on July 30 2020 and I arrived February 18th 2021, landing in Jezero Crater. NASA's plan is for me to spend at least 2 years looking around my landing site. I have already found clay that has given us some answers! Scientists can see from the clay that water carried clay minerals from the surrounding area into the crater. We also know that over 3.5 billion years ago, river channels spilled over the crater wall and created a lake!

Summarising the solar system in three parts

1. Inner planets

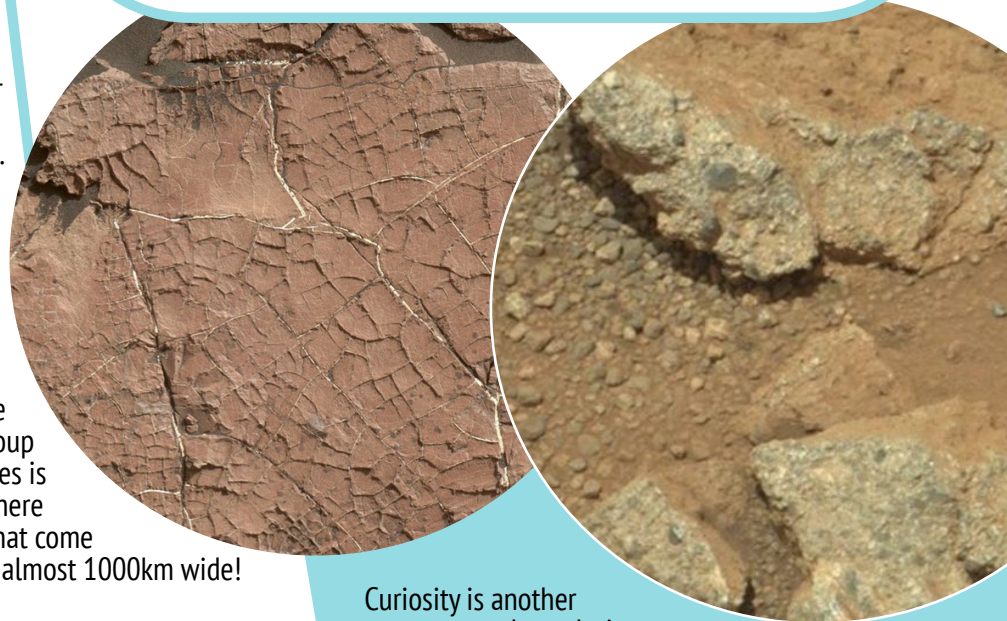
The inner planets are the four planets closest to the sun: Mercury, Venus, Earth and Mars. The inner planets all have solid rocky surfaces and are similar in size when compared to the outer planets. Inner planets also take quite short period of time to orbit the Sun and possess a small number of moons. For example Earth, as you know, only has one – The Moon!

2. Asteroid belt

In the large space between Mars and Jupiter, there are small bodies, mostly rocky or metallic, that group together and orbit the sun. This collection of bodies is called the asteroid belt. Scientists estimate that there are over 2 million asteroids in the asteroid belt, that come in sizes ranging from a small as a dust particle to almost 1000km wide!

3. Outer planets

The outer planets are Jupiter, Saturn, Uranus and Neptune. The four outer planets are often called gas giants, as they are made mostly of hydrogen and helium in gas and fluid form. These are the same elements that make up most of the sun. The outer planets have lots of similarities to each other; for example, they all have numerous moons and planetary rings, composed of dust and other small particles that encircle the planet in a thin plane.

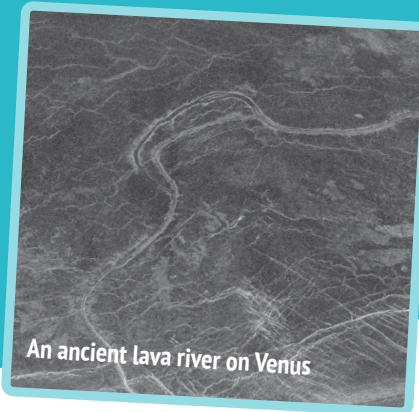


Curiosity is another rover currently exploring Mars. It landed in Gale crater in 2012.

Curiosity found these features in the rock, which could show that water was once present on Mars's surface. These cracks often form in mud when water dries up, and pebbles are formed when small jagged stones are rolled and tumbled in flowing water.

ROCKS IN SPACE

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An ancient lava river on Venus



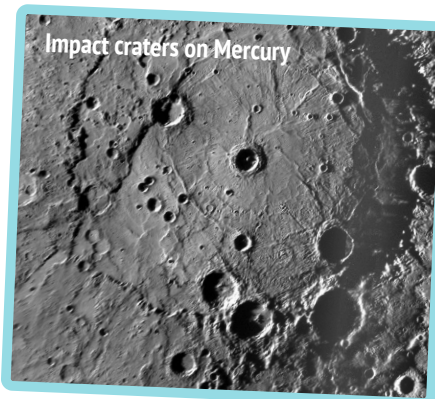
Olympus mons, a huge volcano on Mars

Space volcanoes!

The inner planets all have surfaces made predominantly of the **igneous** rock **basalt**, which forms when molten **lava** cools down to form hard rock. On Venus and Mercury, there is evidence of **flood basalts**, where lava flows out of several volcanoes at once or large cracks in the planets surface, covering a huge area with flat plains of basalt.

Venus and Mars also have enormous **volcanoes**, where ancient lava flows can be seen running from their summits like rivers. On some areas of Mars, the volcanic rocks have been **weathered** and **eroded** by ancient rivers to form sedimentary rocks made of sand and pebbles.

All rocky bodies in the solar system, especially our Moon and Mercury, are covered in impact craters where meteorites have smashed into their surfaces!



Impact craters on Mercury



Pluto is an example of a dwarf planet

What exactly is a planet?

Objects in our solar system are divided up into different categories depending on their **properties**.

Planet: Something that orbits a star but is not itself a satellite. It needs to have enough mass so it is almost spherical in shape, and has **cleared its orbit of other objects**. This process is also known as 'clearing the neighbourhood' and happens at the end of planet formation. The planet becomes gravitationally dominant, meaning there are no other bodies of similar size nearby, other than its natural satellites.

Moons: the natural satellites of planets. They orbit around an object in space, mainly the planets, dwarf planets or large enough asteroids.

Dwarf Planet: A spherical object that orbits a star but has not yet cleared its orbit of other smaller objects. Dwarf planets are known for having weaker gravities making them unable to clear their orbits.

Did you know?

Some people call Jupiter the solar system's vacuum cleaner as its powerful gravity pulls nearby comets and meteorites into its orbit.

Glossary:

Satellite: a moon, planet or machine that orbits a star

Celestial bodies: Objects in space

Gravity: the force that attracts an object to the centre of a celestial body.

Igneous: rock formed from cooled molten lava or magma

Sedimentary: rock formed from broken up pieces of other rock, like sand or gravel

Weathered: when an object has been worn down by wind and rain

Eroded: when an object has been worn down by knocking, hitting or bumping against other objects

Density

The inner planets are **denser** than the outer planets because they are solid and compact, whereas the outer planets are in a **gaseous state**. Density tells us how heavy an object is compared to the amount of space it takes up. For example, if you had a rock in one hand and a carrier bag full of feathers in the other, the rock would probably feel heavier even though it is much smaller. That's because rocks are usually very dense, but feathers are not!

Have a look at the table below that shows the different densities of the planets, in order of the highest density to the lowest. You can see Saturn's density is very low like the feathers, but Earth's is quite high like a rock!

Planet	Average density (g/cm ³)
Earth	5.5
Mercury	5.4
Venus	5.2
Mars	3.9
Neptune	1.6
Jupiter	1.3
Uranus	1.3
Saturn	0.7