

Animations

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To enter slide show mode, go to the **slide show menu tab** and select either **from beginning** or **from current slide**.

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An illustration of Earth and the Moon in space. The Earth is shown as a curved horizon with blue oceans and green landmasses, with white clouds swirling over it. The Moon is a large, spherical body with a grey, cratered surface, positioned in the upper right corner. The background is a dark blue space filled with small white stars.

The Earth and the Moon

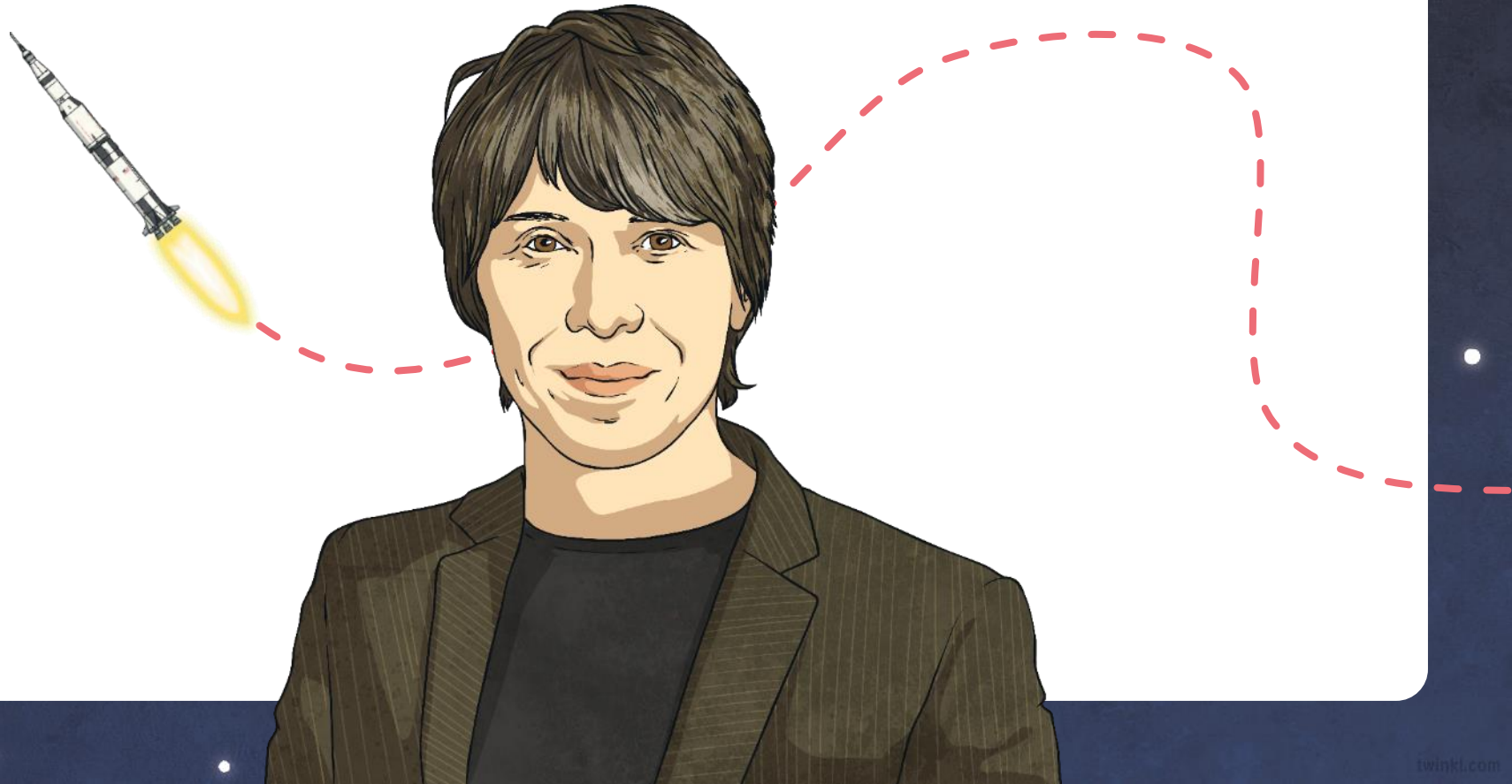


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BBC World Space Week Live Lesson

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Introducing the Solar System

The Solar System consists of the Sun at its centre and everything else that revolves around it, including the eight planets, their moons, **comets**, **asteroids**, rocks and ice, as well as five **dwarf planets**.

The Earth is the third planet from the Sun and is the only planet to have its own single moon.



Many scientists believe that at some time in the past, over four billion years ago, a large chunk of rock around half the size of the Earth (possibly even another planet) collided with it.

The resulting rocky **debris** clumped together to form the Moon.

The Moon

The Moon is the brightest object you will see in the night sky.

It is the fifth largest moon in the Solar System; however, it is unique because it is much larger in relation to the planet it orbits than any of the other planets' moons.



Top Lunar Facts

- The word lunar derives from the Latin word for moon, 'luna' and means anything resembling or affected by the Moon.
- The **radius** of the Moon is about 1740km, which is 27% of the radius of the Earth.
- The Moon and the Earth are about 384 400km apart.

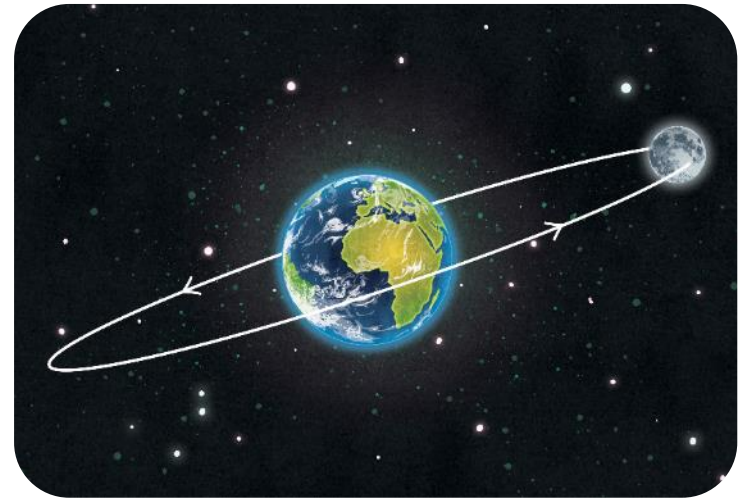
Orbits and Rotations

Just as the Earth orbits the Sun, the Moon orbits the Earth. One complete **orbit** takes around 27 Earth days. The Moon also rotates on its **axis**, just like the Earth, and this rotation occurs at the same rate as its orbit.

This means, here on Earth, we only ever see the same side of the Moon, the nearside.

Did you know... ?

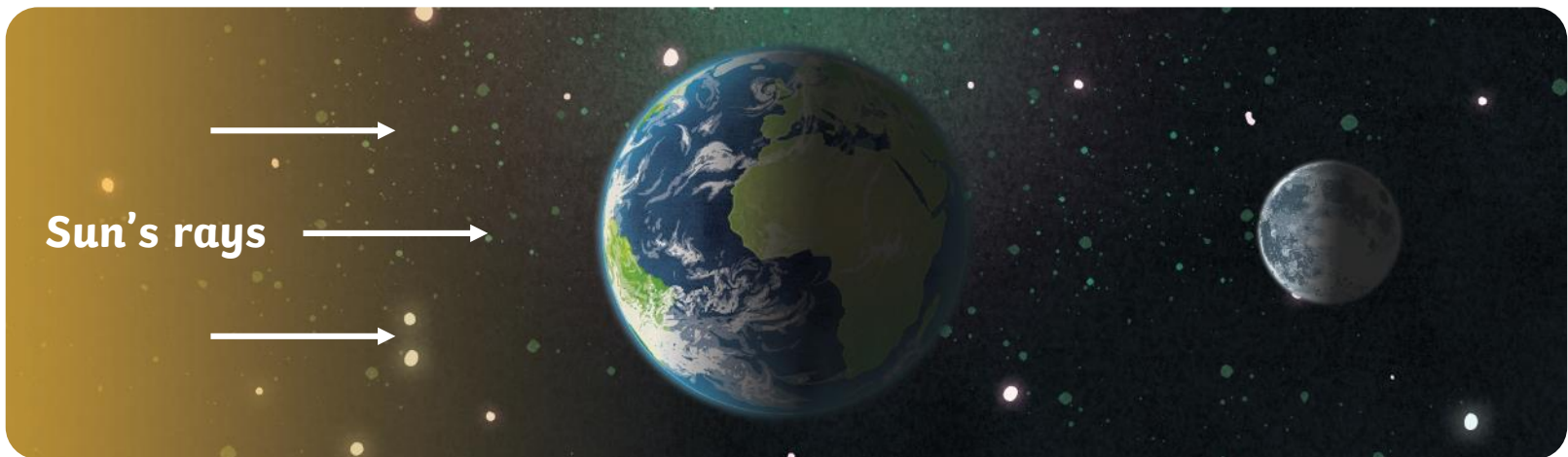
Humans first set foot on the Moon on 20th July 1969 when the American crew from the Apollo 11 spaceflight successfully reached and made contact with the Moon. It was the nearside that they landed on.



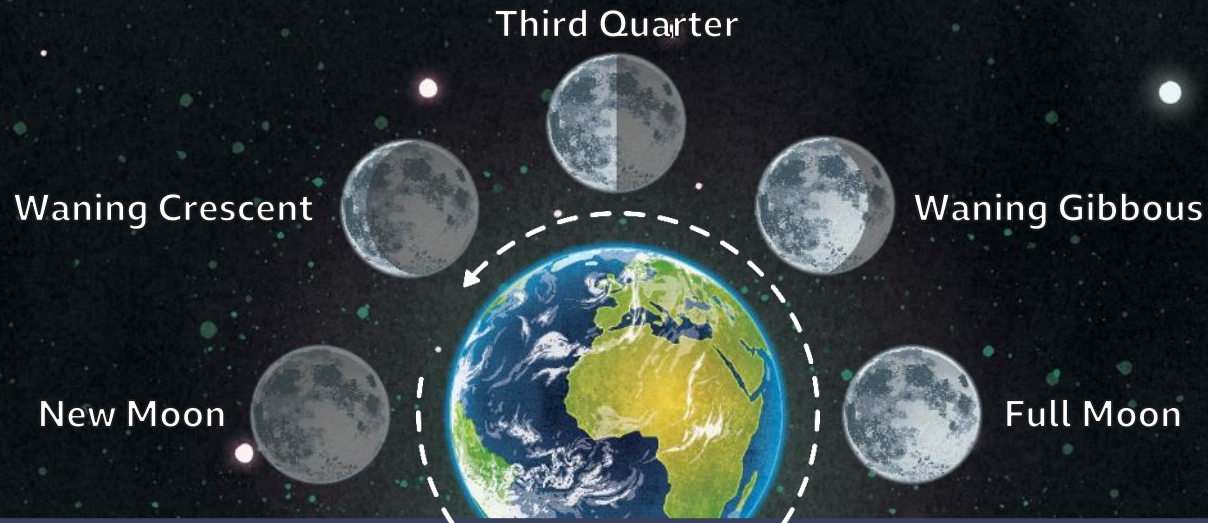
Does the Moon Shine?

Although the Moon is the brightest object in the night sky, it doesn't actually make its own light. The Moon appears to shine because it reflects light from the Sun.

The side of the Moon facing the Sun always appears bright because of the Sun's rays shining on it. There will always be half of the Moon illuminated by the Sun and the other half will always be in the dark because no light can reach it.



Phases of the Moon



As the Moon orbits the Earth over 28 days and the Earth moves through space, the view from Earth of the half-lit side of the Moon changes so it appears to look different. These are called the phases of the Moon and each phase has its own name.

First Quarter

Effects of the Moon on the Earth

As both the Earth and the Moon rotate in space, the Moon has an effect on the Earth in different ways.

3. For a long time, some people believed that the Moon's gravity affected human behaviour; in fact, the word 'lunatic' could well be low as the word 'lunatic' comes from the Latin for 'moonstruck'.
2. The Earth is much weaker than the Moon's gravity, so the Moon's gravity does not have a significant effect on the Earth's climate and seasons. However, this theory has never been scientifically proven!



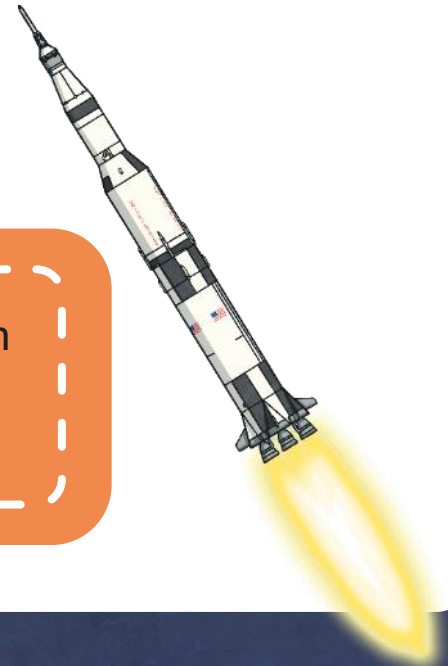
Missions to the Moon

Scientists have been studying the Moon for many years and we already know a lot, but there is still so much more to be discovered.

There have only ever been 24 humans to set foot on the Moon and the rock samples they collected and brought back to Earth are still being studied by scientists now to help them understand more about the structure of the Moon and its conditions.

These are also useful in planning future missions to the Moon, which might allow people from diverse backgrounds to experience it first hand.

The first and most well-known mission that landed on the Moon in 1969 involved three American astronauts: Neil Armstrong, Buzz Aldrin and Michael Collins.



Planets in the Solar System

Remember that the Earth is one of eight planets in the Solar System.

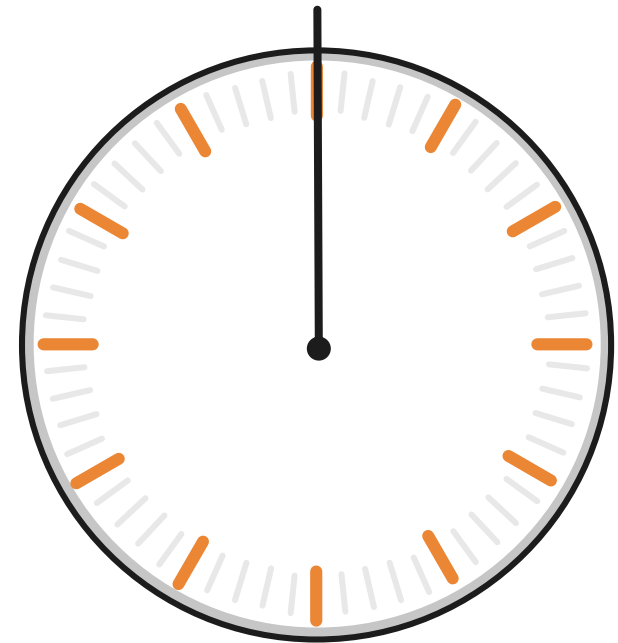
How many other planets can you name in just 30 seconds?

Can you also guess, or remember, how many of these other planets have a moon?

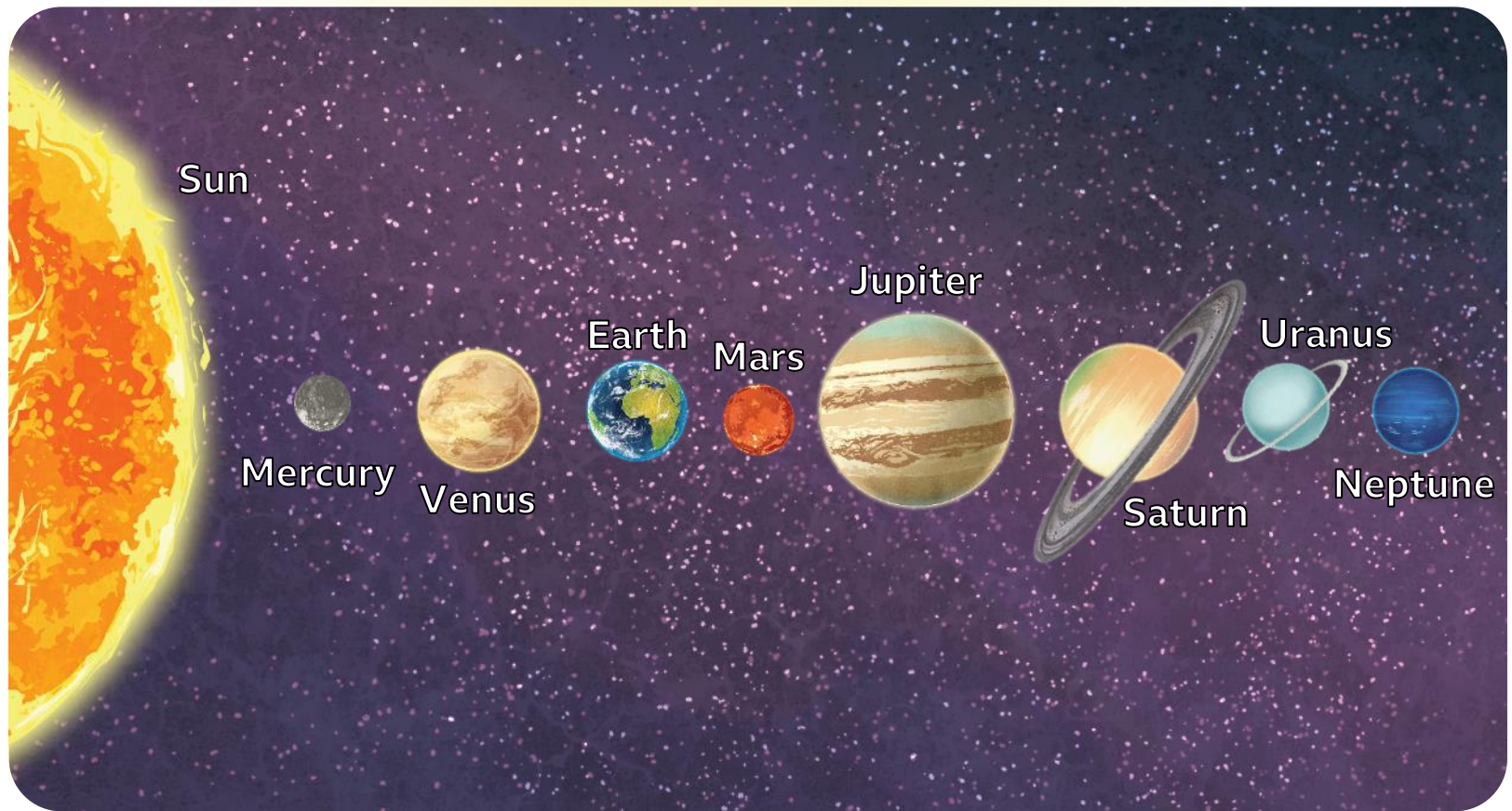
You can complete this task on your **activity sheet**.

Start

3,
2,
1,
blast off!




Planets in the Solar System



More Moons in the Solar System

As for moons, we know that Earth has one moon. What about the other planets?



Mars has two moons:
Phobos and Deimos



Phobos: the larger of Mars' two moons.

More Moons in the Solar System

Jupiter and Saturn each have over 50 named moons, though there are more awaiting official confirmation.

Jupiter



Saturn

Uranus



Neptune

Uranus has 27 moons, while Neptune has 14.

Satellites

Did You Know... ?

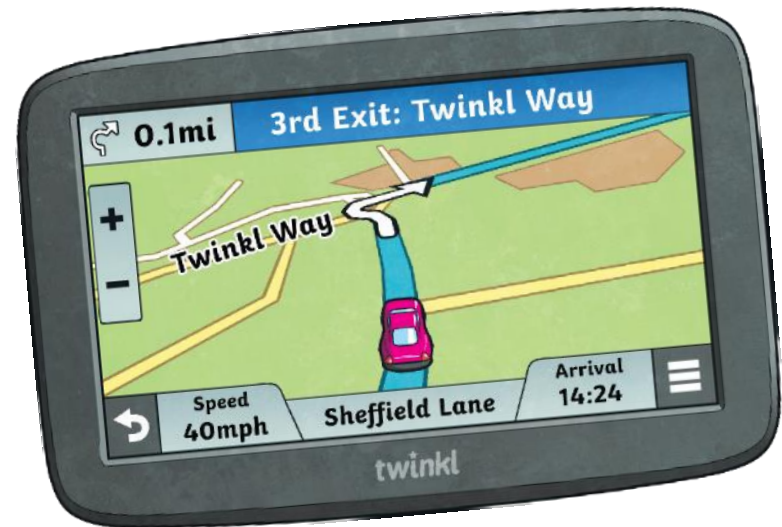
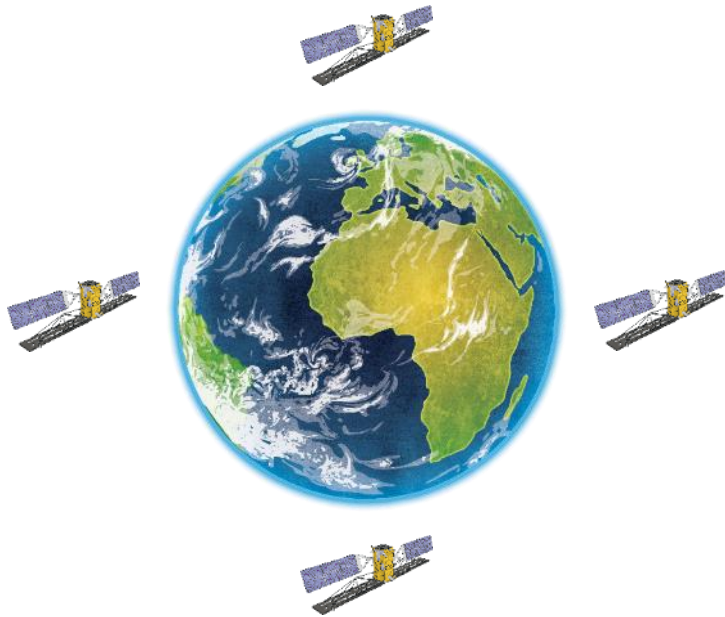
Moons might also be called satellites since a **satellite** is any object, such as a planet, moon or machine that orbits a planet or star. The Moon is the Earth's only natural satellite; however, the Earth has humanly constructed satellites that help us in our daily lives by studying large parts of the Earth quickly.

Some satellites collect information from the Earth and send it back to a different locality on Earth very quickly, making TV signals and phone communications much faster. Others photograph the planet to help predict weather patterns, including extreme weather.



Satellites

A group of satellites work together to form the Global Positioning System (GPS), which can help to track routes and traffic on electronic devices.

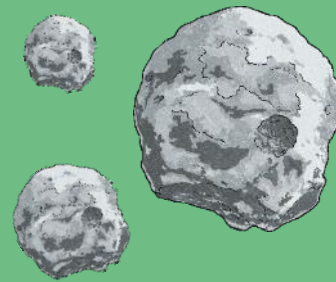


What Is It like on the Moon?

Remember that scientists' most recent theory is that the Moon was made from the rocky debris of a collision? No surprise then that the Moon has a rocky surface covered in fine, grey dust.



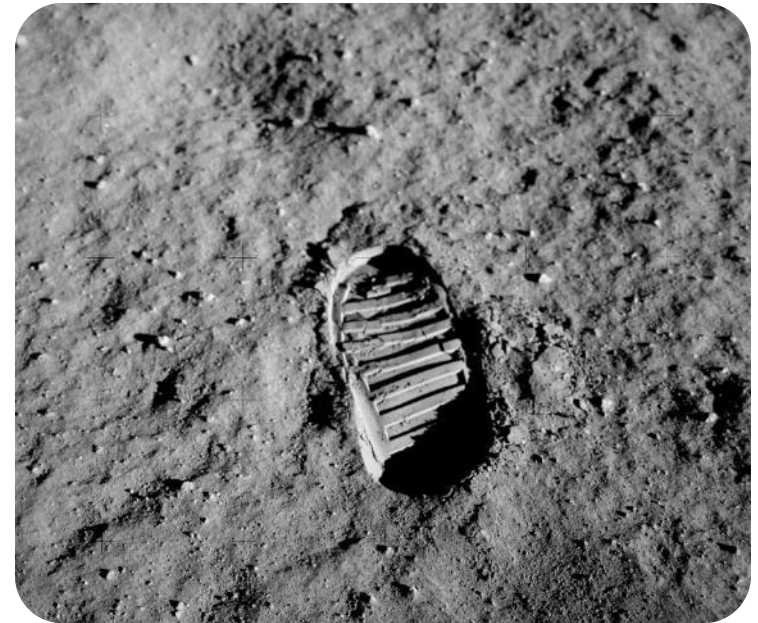
What might come as a surprise are the huge number of **craters** on the surface of the Moon. These craters have been created when large space rocks such as asteroids and comets that orbit the Sun collide with the surface of the Moon and leave imprints.



What Is It like on the Moon?

Unlike the Earth, the Moon has a very thin atmosphere, called an exosphere, with no air or weather to slow such missiles down so, if something bumps into it at speed, it leaves a mark on the surface.

A footprint left on the Moon by one of the first space explorers to have set foot there over 50 years ago!



Quick Quiz



What is the Moon made of?

rock

gas

cheese

metal



Quick Quiz



How does the Moon affect the Earth?

It causes night and day.

It controls the ocean tides and helps to keep the Earth stable on its axis.

It makes the Earth spin.

It turns the Earth into cheese.

Quick Quiz



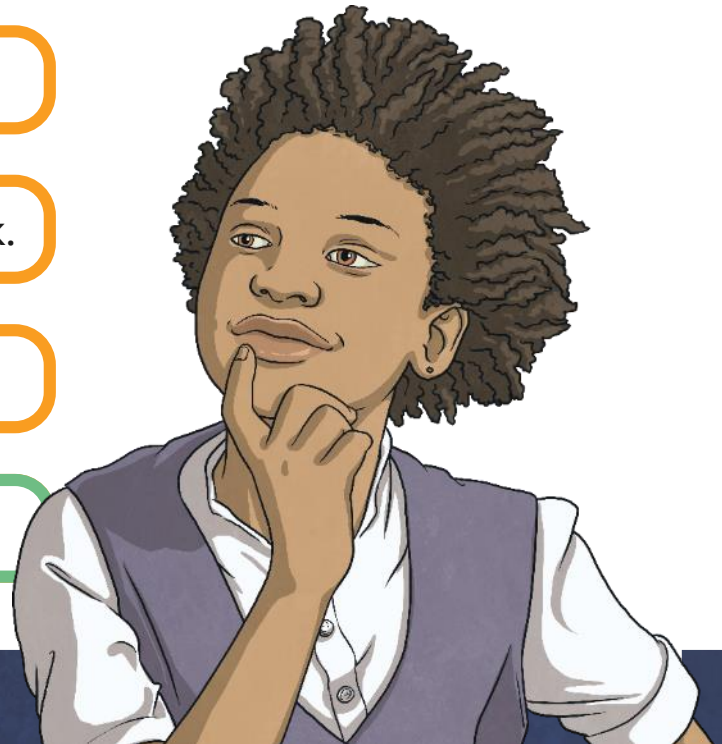
Why does the Moon shine so brightly?

It makes its own light.

It doesn't shine - it is always completely dark.

Someone forgot to switch the lights off.

It reflects the Sun's light.



Quick Quiz



Why does the Moon change shape and size?

It doesn't! From Earth, we only see the part that is lit up so our view changes as the Moon orbits the Earth but the shape and size of the Moon remains the same.

Sometimes it is further away from the Earth.

It gets smaller when it is night time.

Someone ate some of the cheese.

Further Exploration

The Moon continues to be of interest to space agencies across the world and many are still doing important work to take Moon exploration further, including plans for the first woman and first person of Black or Minority Ethnic background to set foot on the Moon.



There are still many opportunities for scientific discoveries to be made on the Moon, using special vehicles to collect samples of rock and to drive over the cratered surface.

The Moon could also be a stepping stone in the future for astronauts to make longer journeys, to Mars for example.

Glossary

asteroid

an imaginary line around which an object, such as a moon or planet, rotates

axis

an object found in space made of ice, gas and dust

comet

a rocky object that orbits the Sun, varying hugely in size

Glossary

crater

a large bowl-shaped hole on the surface of an object, usually caused by a collision with another object

debris

an object in space that resembles a planet but without all of the features that allow it to be classified as such

dwarf planet

the remains of something that has broken up, often left scattered

Glossary

gravity

an object orbiting another object in space, including the Earth, the Moon or another planet, either natural or humanly constructed

orbit

a straight line from the centre of a circle or spherical object to the side or outer edge

radius

the movement of an object in space along a curved path around another object, such as a star, planet or moon

satellite

the force that pulls everything towards the centre of a planet or moon and that keeps the planets and other bodies in their place, orbiting the Sun



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