

# WHAT ARE CONDITIONS LIKE ON THE MOON?

Conditions on the Moon are very different from those on Earth. Compared to Earth, there is less **gravity**, no air or liquid water, extreme temperatures, no daylight and no sound. Astronauts visiting the Moon need special equipment to survive.

## The Moon has little gravity

Gravity is a force that attracts all objects towards each other. The bigger an object, the stronger its **gravitational pull**. The Moon is a lot smaller than Earth and has very little gravity. Earth's gravitational pull is six times that of the Moon.

- ✓ Everything on Earth weighs six times more than it would on the Moon. A person weighing 60 kilograms on Earth weighs 10 kilograms on the Moon.



WHAT DOES IT MEAN



**gravity** the force that attracts all objects towards each other

## The Moon has little atmosphere

Earth is surrounded by a layer of gases called the **atmosphere**. The atmosphere protects Earth from **space** objects, such as **meteoroids**, and helps to create conditions for life to exist. Compared to Earth, the Moon has little atmosphere because its weak gravity cannot hold gases close to its surface. Because of this, there is no air and only tiny amounts of ice on the Moon.

- ✓ Earth's atmosphere provides water and air, so plant and animal life can exist. The Moon's thin atmosphere leaves it dry and airless.



## Moon fact

Most meteoroids heading for Earth burn up in its atmosphere. Hundreds hit the Moon each year, as its atmosphere is not thick enough to stop them.



## The Moon has extreme temperatures

Earth and the Moon are about the same distance from the Sun. Earth's dense **atmosphere** acts like a blanket to protect it from the Sun. This keeps its temperature even. The Moon does not have enough atmosphere to protect itself in the same way. This causes **extreme** temperatures.

### Moon fact 🌙

Temperatures on the Moon can be very hot and very cold. They range from 120°C when the Sun is overhead, to less than -150°C when it is not.

-150°C during the night

120°C during the day

⚠️ The Moon's thin atmosphere cannot protect it from the Sun's heat during the day, or keep it warm at night.

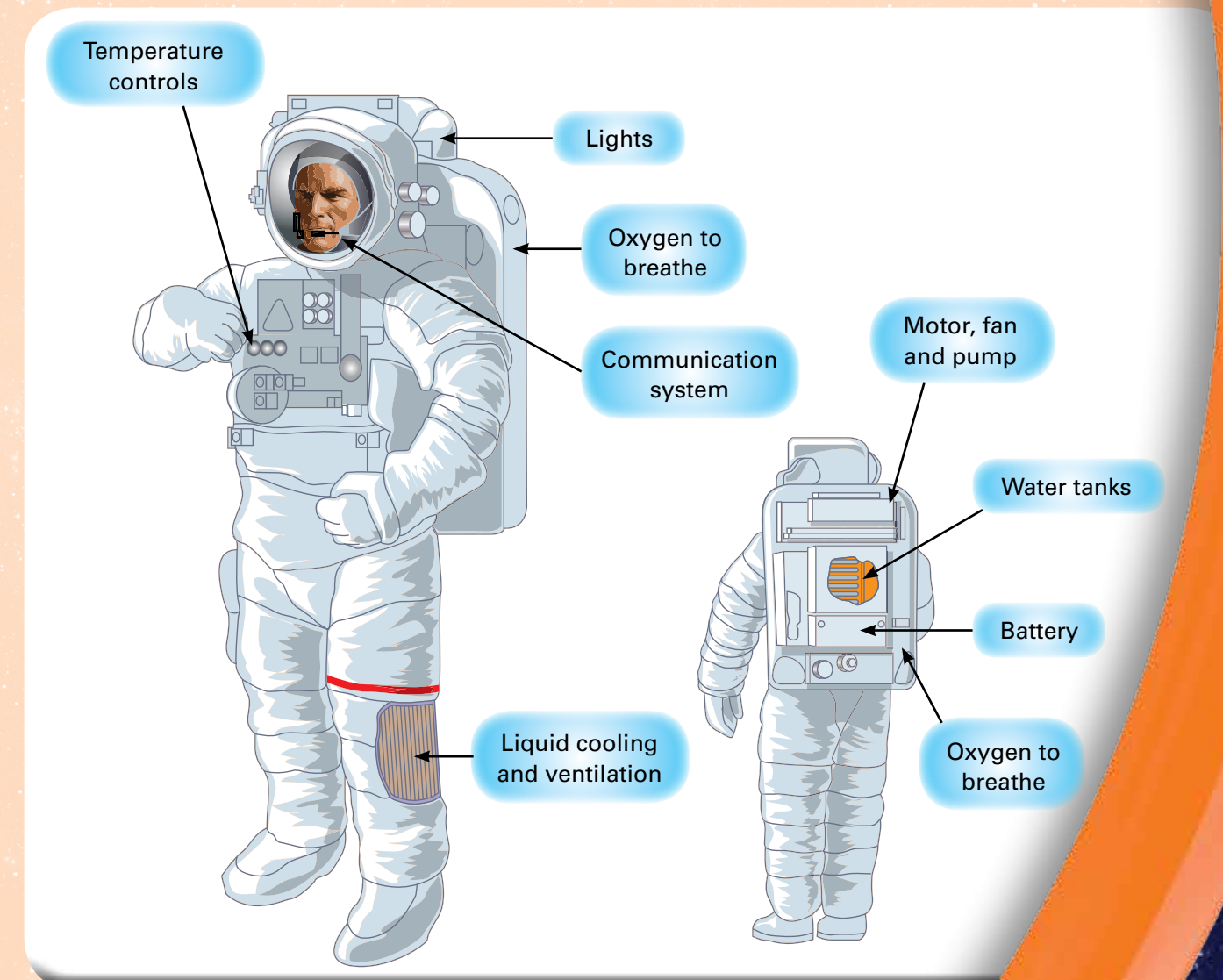
## The Moon has no daylight

There is no daylight on the Moon. The reason we see daylight on Earth is because our thicker atmosphere scatters the light from the Sun. Because the Moon's atmosphere is so thin, it does not scatter the light in the same way. Therefore, on the Moon the sky stays dark, even when the Sun is overhead.

## There is no sound on the Moon

We hear sound on Earth because **sound waves** are carried through the atmosphere. On the Moon, there is not enough atmosphere to carry sound. When **astronauts** hammered a flagpole into the surface of the Moon during the Moon landing in 1969, it made no noise.

✔ Astronauts visiting the Moon need special suits that allow them to breathe and protect them from extreme heat and cold, and radiation.



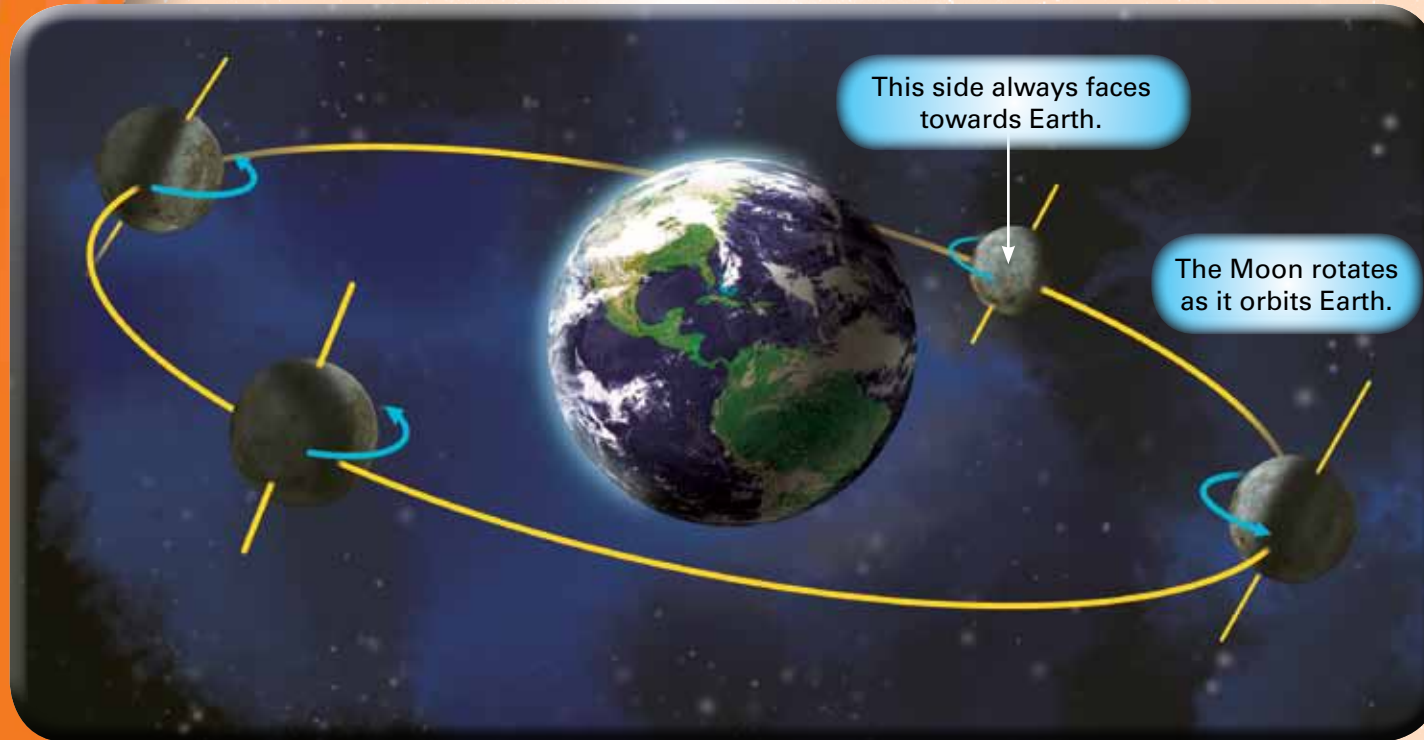


# DOES THE MOON MOVE?

The Moon moves in two main ways. It **orbits** Earth, and at the same time it **rotates** on its axis.

## The Moon orbits Earth

The Moon is a **satellite** of Earth, which means it orbits Earth. It does this because Earth's **gravity** pulls on the Moon as it moves through **space**. The Earth's **gravitational pull** keeps the Moon on the same orbital path and stops it from flying off into space.



- ▲ It takes 27.3 days for the Moon to orbit Earth, and 27.3 days for the Moon to rotate on its axis.

## FAMOUS SKY WATCHERS



In 1687, British scientist and sky watcher Sir Isaac Newton put forward his theories of motion and gravity in his book the *Mathematical Principles of Natural Philosophy*. These theories explain why the Moon orbits the Earth.

## The Moon rotates

As the Moon orbits Earth, it also rotates on its own axis. This means that it turns around like a spinning top. The Moon rotates in an anti-clockwise direction.

## We cannot see the far side of the Moon

The far side of the Moon is the part we cannot see from Earth. As the Moon orbits Earth, the Moon and Earth are also both rotating. Because the Moon takes the same time to rotate on its axis as it does to orbit Earth, the same side of the Moon always faces Earth. The far side is therefore always hidden from view.

- ▼ The first photos of the far side of the Moon were taken in 1959 by the spacecraft *Luna 3*. This photo was taken by *Apollo 15* in 1971.

## Moon fact 🌙

The Moon travels through space at 3683 kilometres per hour. This is as fast as the fastest jet plane can travel in the skies around Earth.

