

Satellites in Space

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Satellites in Space

What Is a Satellite?

A satellite is an object that **orbits** a large object in space, such as a planet. Some satellites are a natural part of our solar system. For example, the Moon is a satellite because it orbits Earth. However, most satellites in our solar system are artificial. These are satellites that have been built by people and **launched** into space from Earth.



An artificial satellite and the Moon both orbit Earth.

Today, thousands of artificial satellites orbit Earth, and they have a wide range of uses. Some can send TV, telephone, GPS (Global Positioning System) or internet signals to different locations around the world. Other satellites are used for scientific research, such as studying Earth's surface or looking deep into space.

Satellites can be built in surprising shapes and sizes. Tiny satellites, often shaped like cubes, can be small enough to fit inside a lunch box. On the other hand, the world's biggest satellite, the International Space Station, has giant wings and is roughly the size of a soccer field.

A large satellite, the International Space Station, is shown orbiting Earth. The station has a complex structure with multiple modules and large solar panel arrays. The Earth's surface is visible below, showing clouds and the horizon. A large red watermark "For Review Only" is diagonally across the image.

The International Space Station is the largest satellite in space.

The First Satellites

The first artificial satellite was launched in October 1957 by the **USSR**. This satellite, named Sputnik 1, was a simple metal sphere about the size of a beach ball. It had four long antennas to send **radio signals** back to Earth.

After three weeks in orbit, Sputnik 1's batteries ran out of power. The satellite continued to orbit Earth until it was pulled downwards by Earth's **gravity**. As Sputnik 1 sped through Earth's **atmosphere**, it burnt up.

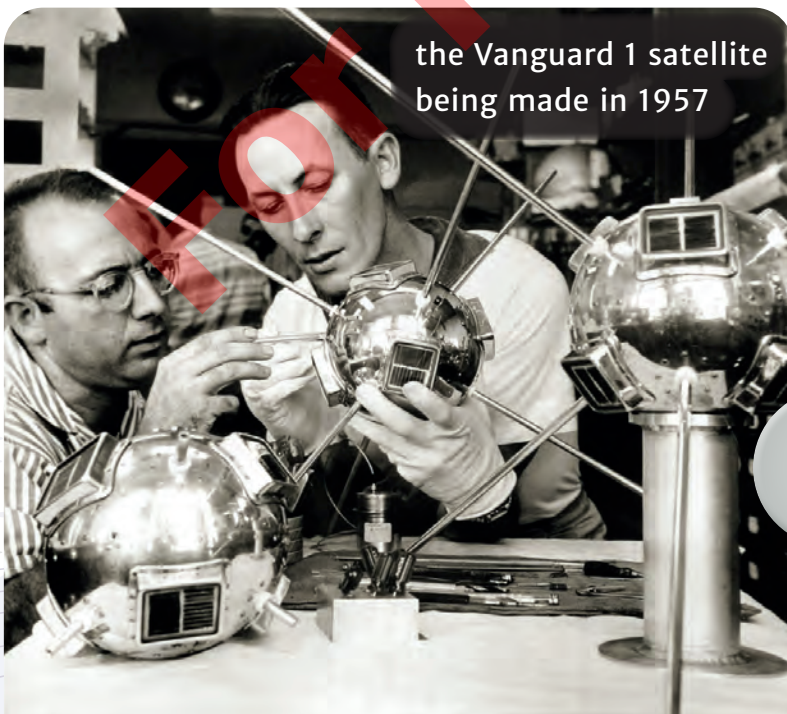
The power for Sputnik 1 came from three batteries, which were kept inside the sphere.



In January 1958, the USA launched its first satellite, Explorer 1. This satellite was shaped like a small rocket and measured about 2 metres long. After its batteries failed, it remained in orbit for 12 more years.

A few months after Explorer 1 was launched, **space engineers** in the USA built a satellite that was fitted with solar panels to provide power. This satellite, named Vanguard 1, is still in orbit today, even though it no longer works.

The launch of these early satellites marked the beginning of a new age in Earth's history. This time is known as "the **Space Age**" – the time when humans **first** travelled into space and started **exploring** the universe.



the Vanguard 1 satellite
being made in 1957



Explorer 1 was launched on
a rocket on 31 January 1958.

Vanguard 1 is the oldest
human-made object in space.

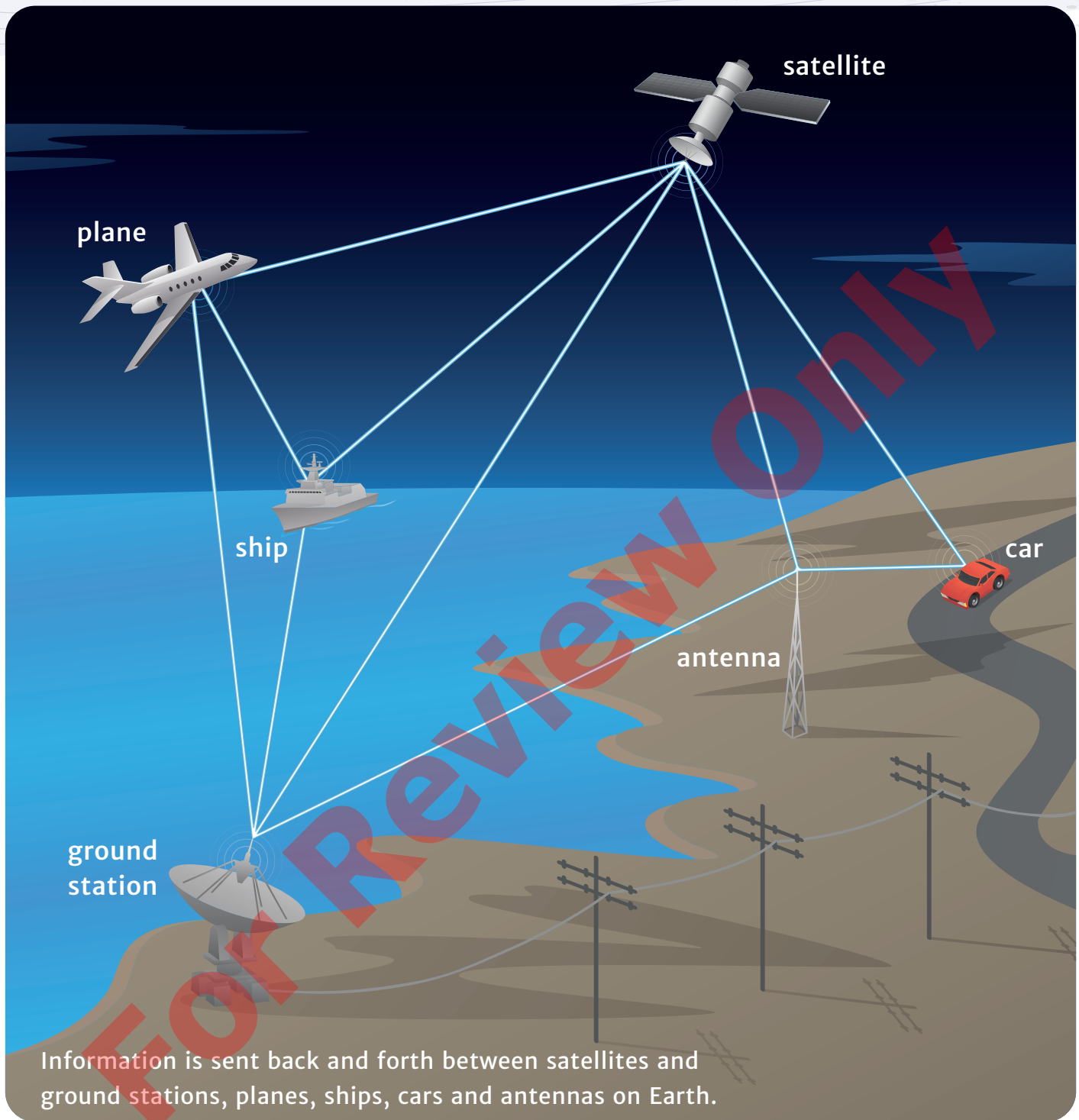
How Satellites Work

Satellites are usually launched into space using single-use rockets. Rockets need to use large amounts of fuel to propel themselves out of Earth's gravity and into space. Then, when a rocket reaches the correct distance from Earth, the satellite is released.

Once a satellite is in orbit, it can send and receive radio signals from Earth. When a signal is sent to a satellite, it can take a few seconds for the signal to reach the satellite and bounce back to Earth. This effect can be seen when TV interviewers talk to people on the other side of the world, as there is a short time delay between the question asked and the answer given.



This large satellite dish in Parkes, New South Wales, Australia, received TV signals of the first astronauts walking on the Moon.



Radio signals can be sent and received from a **ground station** using a large satellite dish. These ground stations are often built in areas where signals can be received easily, such as an open field or the top of a hill.