



Return to the Moon

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The last time a person walked on the Moon was in 1972, but there are plans to return there very soon. Engineers are building a brand new rocket for this new mission.

The new NASA mission to return people – including the first woman and person of colour – to the Moon's surface in 2024 is called Artemis. This name has been chosen for a reason. In Ancient Greek mythology, Artemis is a Goddess – twin sister to the God Apollo. And Apollo was the name of the NASA mission that took people to the Moon for the first time.

People have been going into space to visit the International Space Station (ISS) for the last 20 years, but the Moon is much further – 1000 times further. So, a visit to the Moon requires a different type of space rocket. Engineers are developing a new rocket called the Space Launch System (SLS). It is a much bigger, more powerful rocket than the ones we currently use to get to the ISS. In fact, it is very similar to the rockets of the past like the famous Saturn V rocket that took astronauts, including Neil Armstrong, to the Moon in the Apollo 11 mission in 1969.



A brief history of space travel

Before we go on to find out about this new mission – let's look back to see what has come before.

1942: The German rocket V2 was launched and reached 100 km from the Earth's surface (the boundary of space).

1947: The first animals - fruit flies - were sent into space. They were sent because we wanted to know how being in space would affect living organisms.

1957: Russia sent the first satellite into space to orbit the Earth. it was called Sputnik 1.

1961: Russian Yuri Gagarin became the first man in space. His spacecraft, Vostok 1, completed one orbit of the Earth and landed 2 hours after launch.

1962: Valentina Tereshkova became the first woman in space.

1969: Neil Armstrong became the first man to walk on the surface of the Moon.

1981: The space shuttle was first used. This was the first reusable spacecraft.

1986: The MIR space station was built. It was the first space station that people could live in for several days. It no longer exists as it burned up in 2001 when it crashed back to Earth.

2000: The first people moved into the ISS - a huge space station. People are still living there today.

2014: The Rosetta probe successfully landed on a comet. It took 10 years to reach its destination.

The SLS

The SLS is a very large rocket – 98 m tall. It split into segments, or stages, stacked on top of each other.

The SLS is made up of a giant core that contains two large storage tanks: one for liquid hydrogen, the fuel, and another for liquid oxygen, which makes the hydrogen burn.

At the base of the core are four massive engines. When liquid hydrogen and oxygen are fed into the engines they are ignited with a spark. The hydrogen burns and steam is produced. The steam leaves the engine at speeds of 10 000 mph to generate thrust - the force that pushes the rocket upwards through the air.

A lot of thrust is needed to lift the massive rocket upwards, against the force of gravity so the rocket has two solid rocket boosters (SRBs) on the side of the core. These give the rocket this extra power. When the rocket takes off, they will burn 6000 kg of solid propellant fuel every second. They provide most of the thrust during the first two minutes of flight.

Sitting on top of the core is the Orion capsule. This is where the astronauts will sit. As the rocket travels upwards, the core, engines and rocket boosters will split away and fall back down to Earth (into the sea, where they will be collected). The Orion will be all that is left, and it will leave Earth's orbit and travel to the Moon. Once Orion is in space the pull of Earth's gravity is much weaker, so less force is needed to move away towards the Moon.



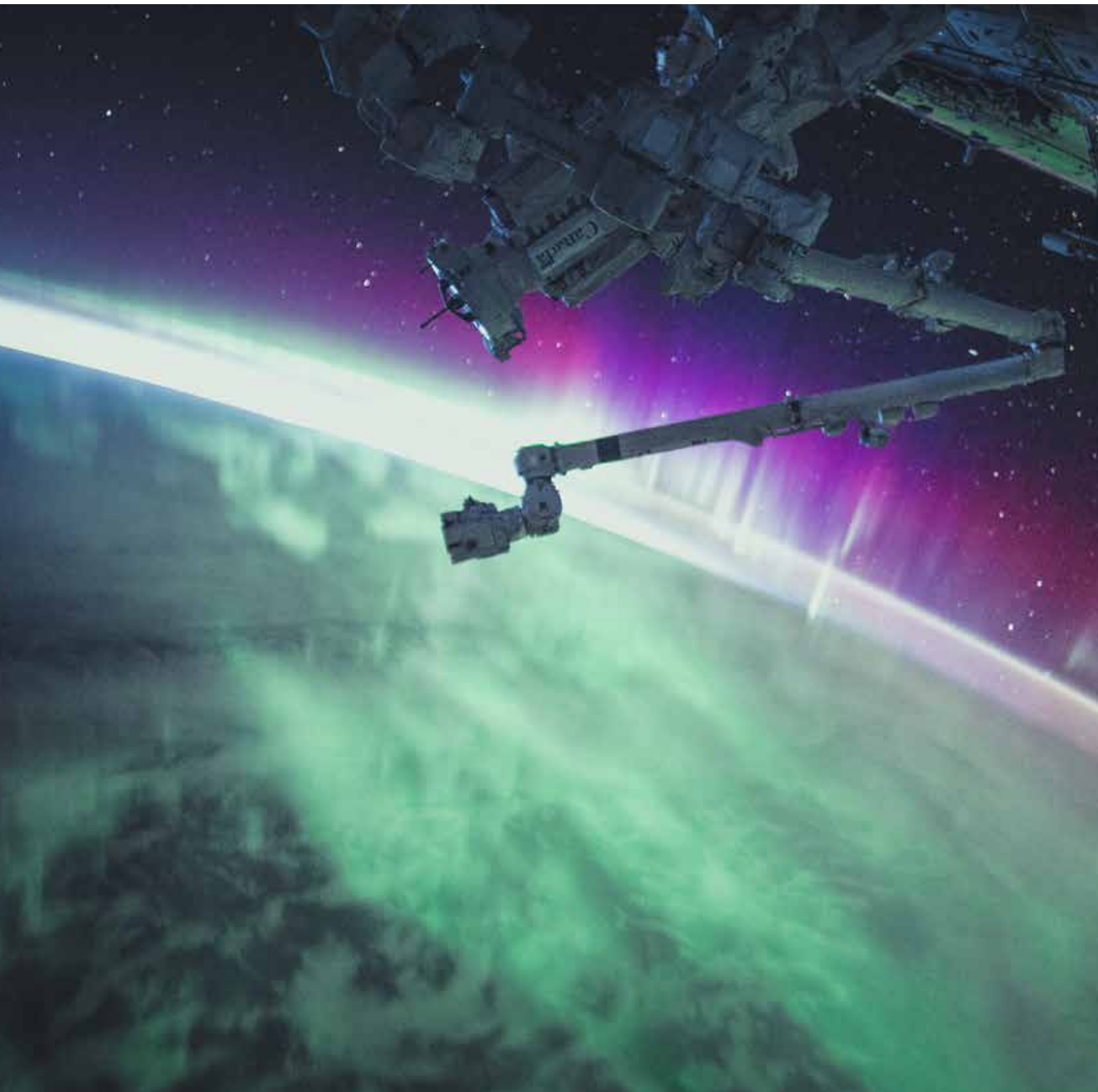
The rocket will be tested (without people on board) in 2021.

Why we want to return to the Moon

We have been to the Moon, and there is not a lot there! Why do we want to return?

Artemis is an important mission in the future of space travel. The next mission will be to take people to our nearest planet – Mars. The technology built in the Artemis mission, and the things the scientists will learn, will be immensely helpful for this next stage in our manned exploration of the Solar System. In the past, people only spent around 3 days on the surface of the Moon. During the Artemis mission, they will spend longer and build structures on the Moon to stay in.

NASA are planning to send people to Mars by the end of the 2030s. That means that the children of today may be visiting Mars when they are older – would you like one of them to be you?



Worksheet

1. Explain why the tip of a rocket is pointed. Hint: the rocket needs to travel quickly through the air.

Draw diagrams to show the forces acting on the rocket when it is:

- a) on the ground before launch
- b) travelling through the air just after launch.

2. Do some research about another NASA mission. Find out:

- a) The years it ran.
- b) The purpose of its mission.
- c) At least one significant event.

3. Research the history of space travel. Write about another event that you think is important.

4. Would you like to travel to space? Write about why.

Curriculum links

KS2

Earth and space
Forces

KS3

Chemical reactions

Forces: forces as pushes or pulls, arising from the interaction between two objects

Forces and motion: forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) change depending on direction of force and its size.



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