

YEAR 3 UNIT 6: We are Astronauts!

Enquiry Question: How do we begin to answer a scientific question?

Related units: Year 2 unit 6: Working Scientifically. What is a balanced diet? Why are materials suitable for different jobs? Year 4, Unit 6: Working Scientifically – How do you work scientifically?

Unit overview

National Curriculum Link Year 3: Working Scientifically

Pupils in years 3 and 4 are given a range of scientific experiences to enable them to raise their own questions about the world around them. They will make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; use simple keys; look for naturally occurring patterns and relationships and decide what data to collect to identify them; make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used; how to use new equipment; collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. These opportunities for working scientifically should be provided across years 3 and 4 so that the expectations in the programme of study can be met by the end of year 4. Pupils are not expected to cover each aspect for every area of study. This Super Science topic is an off-curriculum topic that continues to develop these essential scientific working skills. In this topic children become astronauts. First, they look at the Moon, how humans have visited it and then plan their own mission by designing a Moon lander, making spacesuits and eating space food!

Assessment (Expectations)

1. Describe the appearance of the near and far side of the Moon.
2. Explain how a rocket works
3. Name a famous astronaut and why they are famous
4. Explain 3 problems that scientists have had to overcome by sending people into space

Scientific vocabulary

- Moon
- Rocket
- Thrust
- Orbit
- Crater
- Sphere
- Astronaut
- Cosmonaut
- Taikonaut
- Shock absorber
- Airtight
- Water cooling
- Thermal stabilized food
- Freeze drying
- UV

Working Scientifically

- Ask relevant questions and using different types of scientific enquiries to answer them.
- Set up simple practical enquiries, comparative and fair tests.
- Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Gather, record, classify and gather data in a variety of ways to help in answering questions.
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Identify differences, similarities or changes related to simple scientific ideas and processes
- Use straightforward scientific evidence to answer questions or to support their findings.

Cross-curricular links

Teacher knowledge

The Earth has only one Moon. It is the fifth largest Moon in the Solar System. Missions to the Moon have shown that the craters were formed by the impact of meteorites or asteroids. Both sides of the Moon see the same amount of Sun; however, only one side of the Moon is ever seen from Earth. The side we see is lit by reflected sunlight, while the side facing away from Earth has only been seen by human eyes from a spacecraft. The first spacecraft to reach the Moon was Luna 1 in 1959. This was a Soviet craft, which was launched from what was then the USSR. It passed within 5995 km of the surface of the Moon before going into orbit around the Sun. The far side of the Moon. In the experiment on page 87, air rushes out of the balloon as it contracts and produces a forward motion called thrust. Different sizes and shapes of balloon will create more or less thrust. In a real rocket, thrust is created by the force of burning rocket fuel as it blasts out from the rocket engines. As the engines blast down, the rocket goes up.

The USSR, as it was then, was the early leader in space exploration. They stunned the world in launching Sputnik 1, which was the first artificial Earth satellite, on 4th October 1957. The USSR then decided to find out if a mammal could survive in space and sent a dog called Laika into orbit on Sputnik 2 on 3rd November 1957. Unfortunately, Laika died on the trip but it was still hailed as a great success.

Each mission developed new expertise until the Soviets were confident that they could send a human into space. This was done on 12th April 1961 when the cosmonaut Yuri Gagarin orbited the Earth once in his spacecraft Vostock 1. He returned to Earth a hero to the Russian people. On 16th June 1963, Valentina Tereshkova became the first woman in space. The first cosmonaut to do a spacewalk was Alexey Leonov on 18th March 1965.

Following Yuri Gagarin by less than a month, the second person and the first American in space was Alan Shepard on 5th May 1961. On 24th December, 1968, Frank Borman, James Lovell and William Anders became the first people to orbit the moon. Neil Armstrong and Buzz Aldrin were the first two astronauts to walk on the Moon on 20th July 1969.

Space foods are food products, especially created and processed to be eaten in space in a low gravity environment. They have to provide balanced nutrition and be easy to store, prepare and consume in the spacecraft. Some foods on Earth such as nuts, cake and fruit juices can just be taken into space. Fresh fruit has to be eaten within two days before it starts to go off. Freeze-drying was invented to take the water out of fruit and make it last longer. You can now buy it and it is also seen in breakfast cereals. Tortillas are preferred over crisps because they make far fewer crumbs. Astronaut ice cream can be bought on the Internet. Many foods are treated, either by heat or irradiation, to destroy harmful bacteria or enzymes to make them last. Astronauts need extra vitamins added to their food as part of their diet. Suitable supplies for your picnic basket include: Space foods: tuna in a pouch, tortillas, dried apples, dried cocoa, packet of salad cream, bite-sized biscuits, bottle of salt and water solution, knives and spoons, wet wipes and a plastic food tray. Earth foods: tuna in a tin, loaf of bread, fresh apples, bottle of salad cream, large biscuits, tin of salt, plastic knives and spoon, sponge and a china plate. Spacesuits must provide a stable internal pressure and temperature; allow mobility; supply oxygen and get rid of carbon dioxide; enable communications and collect and contain body waste. A spacesuit also protects the astronaut from UV rays and space dust. The boots must be sturdy and provide grip. More information is available at [en.wikipedia.org/wiki/ Spacesuit](http://en.wikipedia.org/wiki/Spacesuit).

Did you know?

- Jules Verne first wrote about space travel in his book From the Earth to the Moon in 1865.
- Before the rocket blasted into space in 1961, Yuri Gagarin, the first cosmonaut, said, “Here we go!”
- Albert II was the first monkey in space. He went into space on 14th June, 1949 in a specially adapted American V2 rocket that flew to a height of 134km from Earth.
- In Moscow there is a statue that commemorates Laika, a dog, who in 1957 became the first animal to orbit the Earth.
- The first words said on the Moon were: “The eagle has landed”.

Common Misconceptions:

- We can see both sides of the Moon from Earth. In fact, we see just over 51% of one side. Landing on the Moon is science fiction: false, it actually happened.
- Landing on the moon is science fiction. In fact, it actually happened.
- Space flight has stopped now – false, it still continues, especially to the MIR space station.
- People have landed on other planets – false, so far they have not.
- You can drink fizzy drinks in space – you can but they will not stay down.
- You can survive in space without a suit – you would quickly die.

Resources

Activities at the National Space centre, Leicester: <http://www.spacecentre.co.uk/>

Cosmonaut Yuri Gagarin orbited the Earth once in his spacecraft Vostock 1. [Yuri Gagarin: First human in space - YouTube](#)

The first cosmonaut to do a spacewalk was Alexey Leonov on 18th March, 1965: [Aleksei Leonov's First Spacewalk - YouTube](#)

