



TRAVELLING IN SPACE

People have dreamt of travelling into space for hundreds of years. But it is only in the last 50 years that people have succeeded in travelling there.

1. How the Space Shuttle developed

A spaceship is used for travelling outside of the Earth's atmosphere. The first spaceships were launched using rockets which could not be used again. They were left in space and we have 'space junk' which can never be used again.

Later NASA in the United States of America designed the Space Shuttles. The Space Shuttles can be sent up into space, and come back safely to Earth to be used again. Using a spaceship more than once is less expensive than leaving it in space.

2. A spaceship with many uses

The Space Shuttle is like a laboratory for doing scientific experiments in space. It also carries scientists to the International Space Station (ISS) and takes them back to Earth again. The Shuttle is also used to launch satellites for sending TV and radio signals to and from Earth. Satellites are also used for military purposes. The Shuttle has a large room inside (called the payload bay) for carrying satellites.

3. Working in space

When the Space Shuttle arrives in space the doors open and the satellite is unloaded. The Space Shuttle took astronauts to the Hubble Space Telescope to repair the mirror in the telescope.

RIGHT: View of the Space Shuttle Atlantis with its payload open, connected to Russia's Mir Space Station.



NASA stands for: National Space and Aeronautics Administration (USA)

In January 1986 the Space Shuttle Challenger was carrying seven astronauts, including a schoolteacher, when it exploded just after it was launched. This picture tells the story ...

More recently, in 2003, the Space Shuttle Columbia broke into pieces and burned up when it re-entered the Earth's atmosphere on its way back to Earth. All seven astronauts on board were killed.



4. South Africa's own astronaut

Mark Shuttleworth was the first South African to travel into space. In 2002 he was launched into space from the Baikonur Cosmodrome in Kazakhstan. He travelled in a Russian spaceship called Soyuz TM-34.

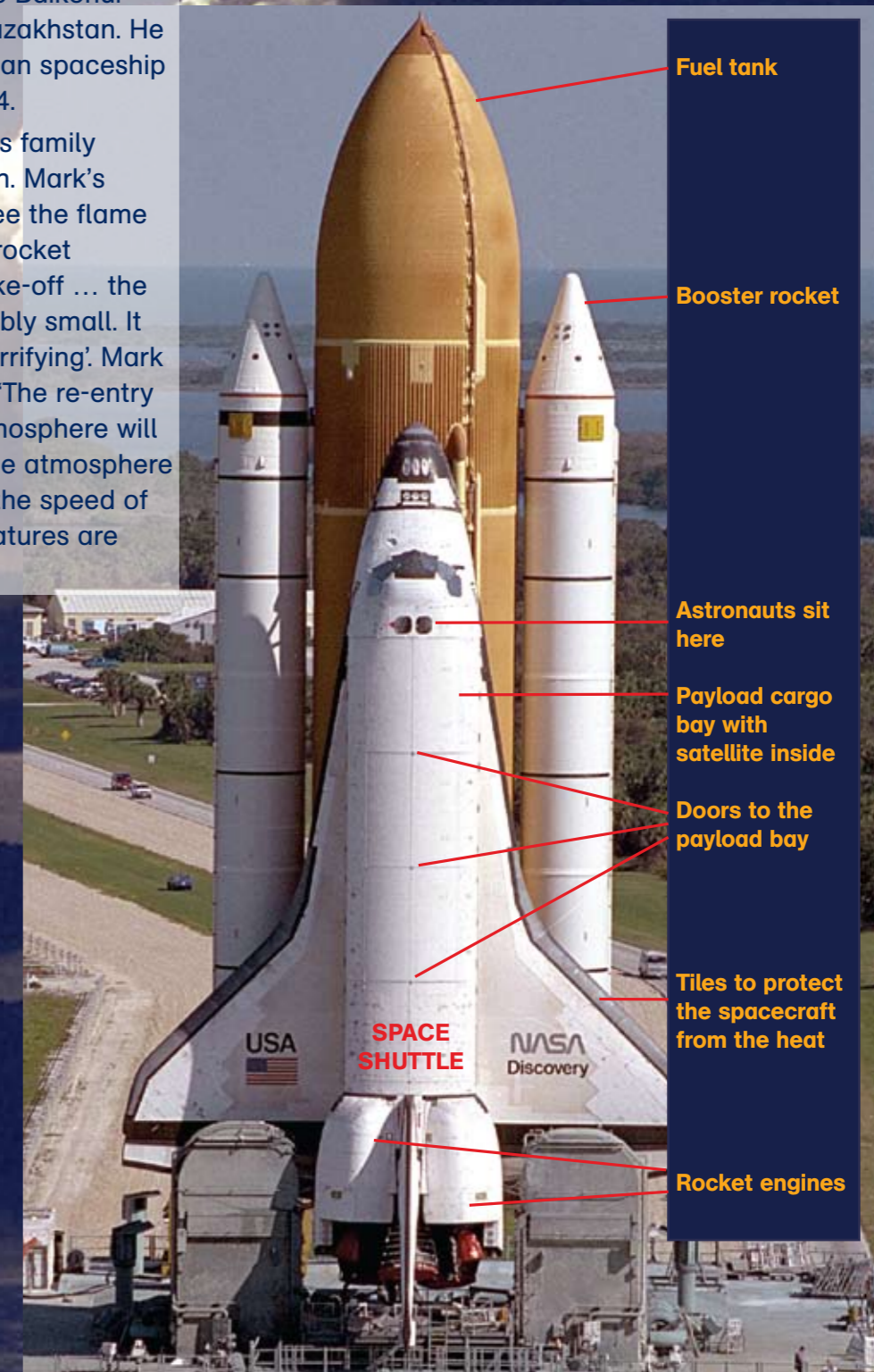
Mark Shuttleworth's family watched the launch. Mark's father said, ... 'to see the flame come out and the rocket hovering before take-off ... the rocket looked horribly small. It was really quite horrifying'. Mark Shuttleworth said: 'The re-entry into the Earth's atmosphere will be scary. You hit the atmosphere at about 30 times the speed of sound and temperatures are very high.'

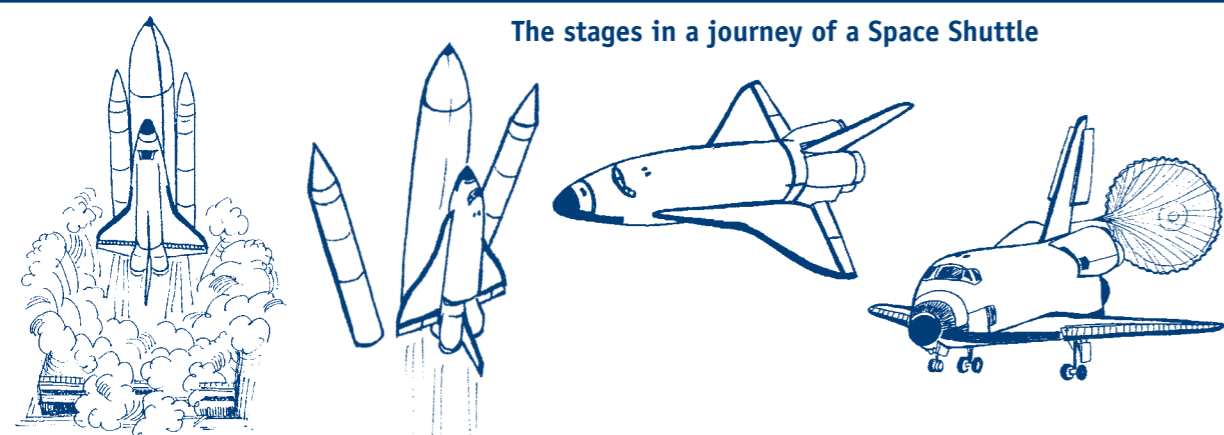
Laika and Yuri

The first living animal to be sent into space was a dog called Laika in 1957. The dog died during this flight.



The first man to go into space was a Russian called Yuri Gagarin. He orbited around the Earth in 1961.





The stages in a journey of a Space Shuttle

ACTIVITY 1. Take a journey in a Space Shuttle

Learning area: Languages

There are different stages in the flight of a Space Shuttle

Sort the stages in the Space Shuttle's journey into space.

1. Read the sentences below (a-j), which show the stages in the flight of a Space Shuttle. Make the following three headings on a sheet of paper:
 - The launch
 - The flight in orbit around the Earth
 - The return to Earth.
2. Sort the sentences below under the three main headings. Use the pictures to help you decide.
 - a) The Shuttle lifts off into space.
 - b) The rocket boosters come away from the Shuttle.
 - c) The empty external fuel tank falls away and burns up in the atmosphere.
 - d) The rocket boosters fall into the sea, slowed down by parachutes.
 - e) The Shuttle leaves the Earth's atmosphere and goes into orbit in space.
 - f) The Shuttle opens its doors to launch a satellite.
 - g) The Shuttle has its own rocket engines to move around in space and to return to Earth.
 - h) The Shuttle re-enters Earth's atmosphere.
 - i) The atmosphere slows the Shuttle down and it glides in to land.
 - j) The runway is 4,5 km long. The Shuttle needs a parachute behind it to help it to stop.

ACTIVITY 2. What does the Space Shuttle do?

Learning area: Languages

The Space Shuttle is used for many different activities

- A. Combine the sentences in the lists below so that they make sense.
1. The Space Shuttle is like a home because
 2. The Space Shuttle is like a taxi because
 3. The Space Shuttle is like a science laboratory because
 4. The Space Shuttle is like a delivery truck because
 5. The Space Shuttle is like a building workshop because
 6. The Space Shuttle is like a rocket because

- a) it helps to build the International Space Station.
- b) it can carry satellites into orbit.
- c) astronauts can live in it.
- d) astronauts do experiments on it.
- e) it carries astronauts to the Space Station. Then, it brings them back to Earth.
- f) it can carry many people to space.
- g) astronauts can travel to space in it.
- h) when it takes off, it flies straight up with a huge explosion of power.

- B. When astronauts travel into space the spaceship has to carry everything that the astronauts need in order to stay alive. It has to carry:
- Oxygen, food and water to support life.
 - Fuel, batteries and solar power to supply energy to launch the spacecraft into space and keep it moving forward.
 - Machinery, computers and other equipment.
 - It has to take all the waste back to Earth after the astronauts have been living in the spaceship.
- C. If you were going into space what else would you carry? Make a list and explain why you would take those things.

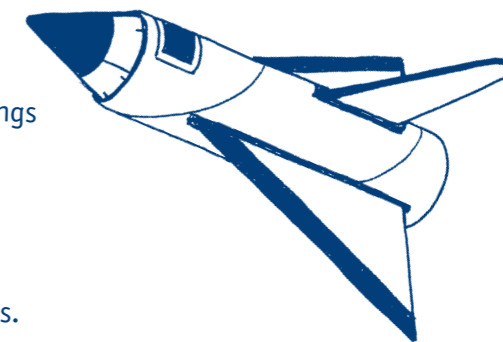
ACTIVITY 3. Make and test a glider

Learning area: Technology

Make the best design for a plane that will glide well

When the Space Shuttle returns to Earth it glides down gently. The shape and wings are specially designed to make it glide, smoothly through the air.

1. Make a plane that can glide using any materials.
2. Test your plane and make any improvements that you think are necessary.
3. Decide which plane design glides the best.
4. Can you think of a reason why one design is better than another? Discuss this.



ACTIVITY 4. Becoming an astronaut

Learning area: Languages

How and why Eileen Collins became an astronaut

Eileen Collins was the first female commander on the Space Shuttle. She has spent more than 6 280 hours in 30 different types of aircraft. More than 537 of those hours were spent in space.

She was a very shy person and did not enjoy sport at school.

1. Read what she said about becoming an astronaut.

'I have always loved flying, ever since I was a small child. My family never had the money to get me flying lessons or even get me a ride in an aeroplane. When I got a job at age 16 I started saving money. Eventually I took my savings to my local airport, at age 19, and I asked them to teach me how to fly. ... I've always been very interested in science, astronomy and geology, and the history of the space programme.'

Flying is a challenge, and I found it was something that I could do well ... We're a nation of explorers. We are the kind of people who want to go out and learn new things, and I would say take risks, but take calculated risks that are studied and understood.'

- a) Then make a mind map about what kind of person would make a good astronaut. Think of what interests, skills, health and fitness, and what type of personality they must have.
- b) Imagine you are an astronaut waiting to be blasted into space. Write a short paragraph or poem about how you feel.



Commander Eileen Collins runs a flight check on the Space Shuttle Columbia.