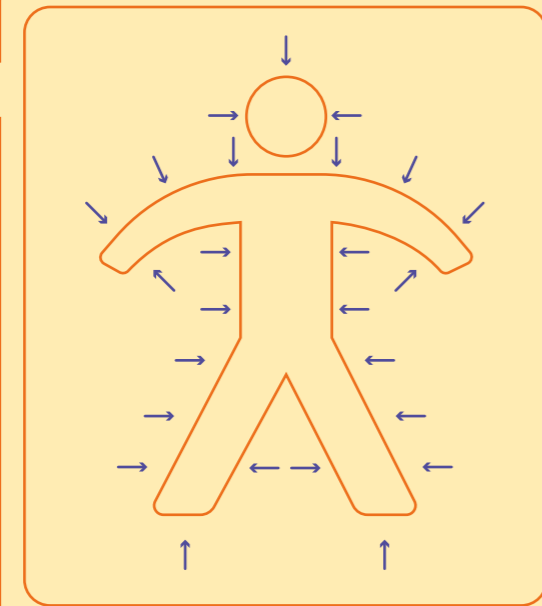


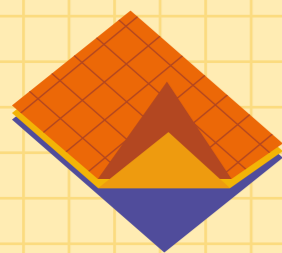
Astronaut Equipment

The Earth has just the right mix of oxygen, water, air pressure, and light for life to exist. Space has very different conditions, which is why astronauts need special equipment to survive.



The air around us creates pressure that we are so used to feeling that we barely notice it. However, in space, there's no such pressure—it's like a vacuum. Without protection, our bodies can't survive the harsh conditions, which is why astronauts wear space suits. The suits balance out the pressure and temperature differences, making sure the person inside gets enough oxygen to breathe. The suit isn't just a protective covering—it has lots of technical devices, including ones that allow astronauts to talk to people back on Earth.

The first space suit to be worn by a human in space was called SK-1. The wearer was the Soviet cosmonaut (what the Russians call astronauts) Yuri Gagarin, in 1961, when he orbited the Earth in the space capsule **Vostok 1**. He was the first human to fly into space.



The process of making the suit and the materials used were kept top secret at the time. This was because different countries were competing with each other in their attempts to explore space.

Emma and Louis have uncovered some of the secrets

The SK-1 suit had three layers:

The **outer layer** was like a suit of armor. It provided protection against space dust and harmful rays from the sun.

Rubber and other materials in the **middle layer** helped to keep the pressure in the suit properly balanced.

The **inner layer** was soft and ensured that the wearer would not get too cold.



The helmet protected the head and special tanks took care of the oxygen supply so the cosmonaut could breathe.

Inside the suit was a small radio that the cosmonaut used to keep in touch with the control center on Earth.

The space suit

The **Extravehicular Mobility Unit (EMU)** used by NASA protects astronauts when they leave their spaceship. They do this when they explore celestial bodies or go for a walk in space.

The helmet has a visor that keeps out the intense radiation from the sun.

A rucksack on the back contains different tanks for oxygen, water, and coolant.

The suit consists of several layers that protect the astronaut against the extreme temperatures they will encounter in space.

The central part of the space suit (covering the back and chest) contains everything necessary for survival—oxygen supply, temperature regulator, and apparatus to enable contact with people back on Earth.

Special gloves were developed to allow the astronaut to use tools and other equipment in space.

Astronauts wear a high-tech diaper that sticks to their skin. Because the space walks take many hours, they cannot go to the bathroom in between. (The longest space walk lasted more than eight hours!)

The arms and legs of the suit have several joints so that astronauts can move freely no matter how much equipment they're carrying.

The boots are thick and tough to protect the astronaut against sharp-edged space dust and micro-meteorites.

As long as astronauts remain on board their spaceship or space station, they don't have to use an EMU. When they're on board the International Space Station (ISS), the crew members often wear a simple training suit. There are special suits for when they go out into space or return to the Earth's atmosphere.

