Room for notes

INTERNATIONAL SPACE STATION 1

The International Space Station is a large **satellite** that **orbits** the Earth at an **average altitude** of 400 km. It travels at a **speed** of 27,000 km an hour (17 000 mph) and **completes** 15 Earth orbits every day.

ISS emblem with flags of participating nations

Image : NASA, Public domain, via Wikimedia Commons

The space station **serves** as a laboratory for scientific experiments in many fields. The **spacecraft** is also used to **conduct** tests for future **missions** to Mars and other planets.

The International Space Station is not **owned** by a single country. It is a project **carried out** by the **space agencies** of several nations including the United States, Russia, Japan, Canada and European countries. Almost 300 astronauts and **scientists** from 26 countries have been sent to the ISS in the 25 years of its **existence**.

The first part of the space station was **launched** into orbit by the Russian Soyuz spacecraft in 1998. Since then, Russian and American spacecraft have been **delivering** most of the modules to **expand** the space station. During this **period** of time **crews** have been **constantly** arriving and leaving the ISS. The space station, with over 30 modules, was completed in 2011 and will stay in orbit until at least 2030.

In 2001, Dennis Tito, an American businessman became the first space tourist to visit the ISS. In 2020, SpaceX became the first private company to send astronauts to the ISS.

Before sunrise or after sunset you can see the ISS with the **naked eye** as a slow bight moving **dot** across the sky. The ISS is the biggest man-made object **orbiting** the Earth, about as bright as Venus.

Experiments and research

Because of **zero gravity** scientists on the ISS can carry out experiments that cannot be done on Earth. They check out the **effects** that zero gravity has on plants and animals, or they can mix together **fluids** which react differently in **space**.

Scientists on Earth can watch experiments or carry out new ones. They can also **monitor** the crew's **data**. Even students around the world can take part in certain ISS experiments and **compare** results.

Living on the ISS for a longer period gives **researchers** an **insight** into how the human body changes when it is **exposed** to **weightlessness** for a longer time. This data is important in order to see how astronauts react when they go on a longer trip, for example, to Mars. Such an **expedition** would take almost three years to **complete**.

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Life on board the ISS

The **atmosphere** that is **created** on board the ISS is similar to the Earth's atmosphere. The food that the astronauts eat is mostly **frozen** and **canned**. There are kitchen **appliances**, like warmers and **refrigerators** , on board. Drinks are made by adding water to powder. **Waste** is collected in bags and then carried away by an **air stream**.

The space station gets its **power** from solar **panels** that turn the sun's energy into **electricity**. They are much more **efficient** than solar cells on Earth. Some of the energy is turned into heat which keeps the space station at the same temperature all the time.

Water and **oxygen** are **delivered** to the ISS from Earth, but some of it can be **recycled** on board the station. Oxygen can be created from the **carbon dioxide** that the astronauts breathe out, or through recycled water.

Workday

A typical day for the ISS crew begins at six o'clock. After breakfast they have a conference with **ground controllers** before work starts. A lunch **break** and more work and exercise lead them up to 19.30. Then they have dinner, another conference and go to sleep at about ten.

Health risks and long-term space travel

Although low Earth orbit **partly protects** the ISS astronauts from **radiation**, they still are **exposed** to radiation levels that are five times higher than those in a passenger airplane.

There are a number of health risks in **long-term** space travel. **Muscles** and bones become weaker. Pumping blood into the heart **slows down** and the immune system **weakens**. To prevent this from happening, astronauts and scientists have to **exercise** regularly. For this **purpose**, there is **equipment** for **weightlifting**, a **stationary** bicycle and a **treadmill** on board.

Microgravity is **similar** to what we **experience** when we get older. So, scientists can get new **insights** into the **aging process**.

Astronaut exercising on a treadmill

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