Life in Space

A Reading A–Z Level S Leveled Book
Word Count: 999

LEVELED BOOK • S

Life in Space

MULTI LEVEL S•V•Y

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Written by Jennifer McStotts

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Front cover: Astronaut Scott Kelly floats in front of the windows on the ISS.

Title page: Astronaut Rick Sturckow gives a thumbs-up in front of a wall filled with the badges that represent the different crews who have worked on the ISS.

Table of contents: Astronaut Chris Hadfield poses in front of a floating water bubble.

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Correlation

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Weightless Living

You wake up just as the Sun is rising. It takes a moment to untangle from the sleeping bag in the small space. Opening the door, you grab a handle and flip yourself over. With a gentle push, you fly from one end of the room to the other. Another crew member floats by, hands you some coffee, and says, "Good morning," in Russian. You thank him and yawn, tired because you haven't slept much. Your stomach isn't used to the lack of **gravity** yet—and you're incredibly excited.

A space shuttle docks with the International Space Station.

You're about to begin your first day working on the International **Space Station**. Even simple activities are difficult without gravity. It's almost as if you have to learn them all over again. You won't head back to Earth for another six months, so you may as well get started.

The Race to Space

People began racing into space in the 1950s and 1960s. The first person in space was **cosmonaut** Yuri Gagarin, from Russia (then part of the Soviet Union). He **orbited** Earth one time and landed safely after 108 minutes on April 12, 1961. In 1968, U.S. **astronauts** on *Apollo 8* successfully orbited the Moon. On July 20, 1969, the crew of *Apollo 11* stepped onto the Moon's surface.

Space programs created vehicles that let people stay in space for days or weeks. However, scientists were building a structure in which people could actually live for months or years.

The Soyuz spacecraft, first created in the 1960s, are still being used to take people to and from the International Space Station.

Space Stations

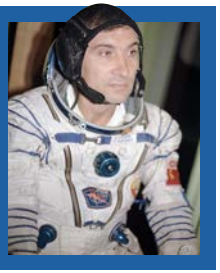
A space shuttle docks with Mir.

The Soviet Union **launched** the first space station in 1971. It spent 175 days in space. In 1973, the United States launched Skylab. It supported three **missions** before being abandoned in 1974.

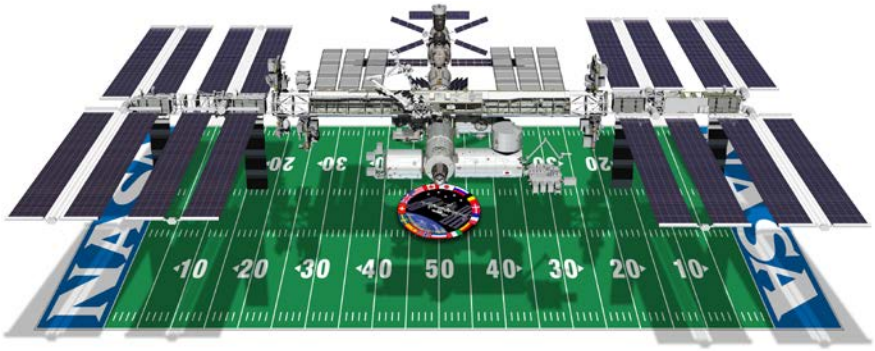
The Soviet Union launched the Mir (MEER) space station in 1986. It was the first space station that lasted more than a few years. Mir remained in orbit for fifteen years—three times longer than planned. Scientists from many different countries visited it.

438 Days in Space

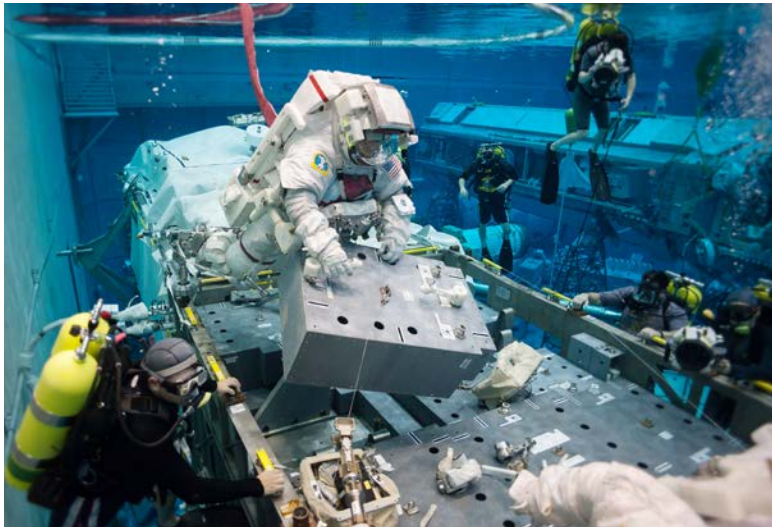
A Russian scientist spent 438 days in space in 1994 and 1995. During his stay, he lived on Mir and orbited Earth 7,075 times. His record still stands.



Before Mir was abandoned, work began on a new, larger space station. The United States, Russia, Japan, Canada, and other countries worked together. In 1998, the first section of the International Space Station (ISS) was launched into orbit. More sections have been added over the years, and more are planned for the future. As of 2012, the ISS was as long as a football field and weighed almost 1 million pounds (453,592.3 kg).



Over the years, more than two hundred people from fifteen countries have visited the station. Many astronauts stay on the ISS for about three to six months. Staying on the space station can be very difficult. Scientists have found ways to make it easier for astronauts to live in space.



An astronaut practices repairing part of the ISS on an underwater model. Working underwater helps prepare them for space walks.

An Astronaut's Life

Astronauts go to school for many years before they begin **training**. The physical training involves being weightless while flying in an airplane. Astronauts also spend up to seven hours in a space suit while working underwater. They work on models of space vehicles in a huge pool.

Sick in Space

The change to being weightless can make some people ill. Fortunately, the ISS comes with special bags. They have a cloth side that can be used to clean up as well as an extra sealable bag attached for easy disposal.

Sleeping

The ISS has six small "sleep pods" that each hold a sleeping bag with armholes. Each bag is tied to the wall to keep the astronaut from floating away. Because of the space station's orbit, astronauts on board see sixteen sunrises and sunsets every day. Since people are used to sleeping at night and being awake during the day, this can cause sleep problems. The space station has a "shades down" period. During this time, it is dark and quiet to allow the astronauts to get the sleep they need.

Astronaut Alvin Drew prepares to sleep on the ISS.

An astronaut has a breakfast of eggs and sausage on a tortilla with coffee on the ISS.

Eating

Astronauts eat many of the foods most people enjoy, such as chicken, fruits, peanut butter, and brownies. The ISS has no refrigerator, so all food has to be packed so it won't spoil. The station does have an oven, however. Some food can be eaten as is. Other food, such as spaghetti, must have water added. Astronauts use liquid salt and pepper. Regular salt and pepper would float away and damage the space station equipment. Once the food is prepared, however, astronauts still have to get used to swallowing. Astronaut Piers Sellers said it was like "eating while lying on one side."

Using the Toilet

Using the bathroom can be tricky. Astronauts need special training to use the toilet. The toilets on the ISS have two parts. For liquid waste, astronauts use a tube with a **nozzle**. For solid waste, astronauts must use foot straps and handles to stay in place. The toilet takes the waste from the opening or tube to where it is stored.

The tube hanging on the wall is for liquid waste. The base on the floor is for solid waste. The ISS has two toilets.

Astronaut Karen Nyberg shows how she washes her hair on the ISS.

Bathing and Teeth Cleaning

Astronauts use water and special soap on a cloth to wash their bodies. They wash their hair with shampoo that uses no water. To clean their teeth, they use toothpaste that can be swallowed when they're finished.

Free Time

Astronauts on the ISS might play cards, read, or write, among other things. Talking with loved ones is also important. Astronauts are able to make calls and use video chats. Sometimes astronauts answer questions from students all over the world or give video tours of the station. Many just look out the windows or take photos. Who can blame them? The view is pretty amazing.

Astronaut Chris Hadfield plays guitar on the ISS. During his last visit to the space station, he even made a music video.

Astronaut Luca Parmitano exercises on a treadmill on the ISS.

Exercising

When people exercise on Earth, their bones and muscles must work against gravity, which makes them stronger. The lack of gravity in space makes it very easy to move things. Because of this ease, astronauts' bones and muscles weaken over time.

Astronauts must exercise at least two hours every day. Even with a daily workout, their bones and muscles are weaker when they return to Earth.

Astronauts return to Earth from the ISS in 2013.

Back to Earth

When astronauts return to Earth, the work isn't over. After a six-month stay on the ISS, it takes six weeks of exercise to regain their strength. It can take a whole year for an astronaut's bones to fully recover. Astronauts have to work hard, but the time spent living and working in space is worth it.

Scientists always keep track of the astronauts' physical and mental health. The information they gather has already helped astronauts live healthier and happier lives. This information might mean the success or failure of future space travel.

Glossary

astronauts *(n.)* people trained to travel and work in space (p. 5)

cosmonaut *(n.)* a person trained to travel and work in space; a Russian word for "astronaut" (p. 5)

gravity *(n.)* the natural force that tends to pull objects toward each other, such as objects being pulled toward the center of Earth (p. 4)

launched *(v.)* used force to start something moving (p. 6)

missions *(n.)* flights of a spacecraft or aircraft with the purpose of completing a special assignment (p. 6)

nozzle *(n.)* a part at the end of a hose, pipe, or tube that is used to direct and control a stream of liquid or gas (p. 11)

orbited *(v.)* revolved around another object (p. 5)

space station *(n.)* a spacecraft in which people can live for a long time, used for scientific experiments and research (p. 4)

training *(n.)* the teaching of a specific skill or behavior (p. 8)