

Living and Working Aboard the International Space Station

The first space station crew members will spend a lot of their time setting up the station, building its components and conducting various scientific experiments and Earth observations. The crew will live in the service module at first. This module has spartan living quarters, but provides everything the crew needs -- personal sleeping quarters, a toilet, hygiene facilities, a kitchen with a table, a treadmill and a stationary bicycle. Astronauts will have to exercise frequently to keep from losing bone and muscle mass, which happens with prolonged weightlessness.

Sleeping

Sleeping in space is quite different from sleeping on Earth. Instead of a bed, you have a wall-mounted sleeping bag that you slip into and zip up. The bag is also equipped with arm restraints to prevent your arms from floating above your head while you sleep.

Bathing

While stations such as Skylab and Mir have been equipped with a shower, most astronauts take sponge baths using washcloths or moistened towelettes. This reduces the amount of water consumed. Each astronaut will also have a personal hygiene kit with a toothbrush, toothpaste, shampoo, razor and other basic toiletries.

Eating

The food on the ISS will be mainly frozen, dehydrated or heat-stabilized, and drinks will be dehydrated. Astronauts will collect food trays and utensils, locate their individually-packaged meal from a storage compartment, prepare the items (rehydrate if necessary), heat the items (microwave, forced-air convection oven), place them in the tray and eat. After the meal, they will place the used items in a trash compactor, and clean and stow the utensils and trays. Interestingly, astronauts get to select their menus approximately five months before their flight.

Exercising

In weightless conditions, the body loses bone and muscle mass. To counter these losses, astronauts will have to exercise daily. The service module is equipped with a treadmill and a stationary bicycle. Astronauts must strap themselves onto these devices so that they do not float away while exercising.

Working

Once the ISS is completed, work will involve maintaining the station (fixing broken equipment, repairing structures, etc.) and conducting scientific experiments and observations. The station will have six scientific laboratories. Closet-sized racks along the walls of the laboratory module will hold the equipment, and the astronauts will use footholds and restraints so they won't float away while working. The experiment racks will also have remote video and data links so that scientists on the ground will be able to monitor the experiments on-board the ISS continuously. The Japanese laboratory

module will have a platform open to space, for determining the effects of the space environment on materials.

Moving Around on the ISS

Working in weightlessness, or **microgravity**, is very different from what we are used to. For example, as I write this article at my computer, I do not have to worry about floating off of my chair, or having the papers on my desk float away. This is not the case in the ISS. As we have mentioned above, many places (experiment racks, kitchen area, crew quarters) will have restraints to keep the astronauts and equipment from floating away. And while I can walk the corridor in my office with no trouble, astronauts on the ISS will have to use handholds mounted on the walls of the station to keep themselves stable as they move around.

Spacewalks

The crew will have to perform spacewalks during construction and maintenance of the ISS. Initially, the crew will perform spacewalks from the Russian service module using Russian spacesuits. Because spacesuits operate at lower pressures than the station, the astronauts will have to reduce the air pressure of the entire station prior to the spacewalk, so that the spacewalker's body can adjust; otherwise, the spacewalker might get the bends.