SPACE SUITS

DISCUSSION

While on orbit in the space station, astronauts dress to live comfortably and work safely in the environment of space. Inside the station, the temperature is between 18.3 and 32.2 degrees Celsius (65 and 90 degrees Fahrenheit) with a relative humidity between 30 and 50 percent. Outside the station, temperatures vary from -100 Celsius to 120 degrees Celsius (-148 to 248 degrees Fahrenheit).

Each astronaut is outfitted with the clothing needed for the work that is to be done during his/her 90 day mission. All the crew members have clothing for cooking, cleaning, relaxing, and sleeping inside the space station The astronauts that work in the laboratory module with manufacturing, experiments, or science activities, have the clothing needed for that job, too They also have safety goggles and rubber or fire retardant gloves. Most of the time, the crew wears slipper socks, but they also have tennis shoes and boots.

Some of the crewmembers must work outside the space station and they have clothing to protect themselves. The complicated space suit worn outside the space station is called an **extravehicular mobility unit** (EMU). This suit provides correct air pressure, temperature, oxygen, drinking water, food, and electrical power. It also protects the astronauts from micrometeoroids. Micrometeoroids are tiny objects (natural or manmade) that are in orbit around the planet thousands of miles per hour. A hit from one of these fingernail size objects could kill an unprotected astronaut or disable a spacecraft.

Astronauts aboard the space station use improved EMU space suits when they go outside to build, repair, and resupply the station; check experiments; or fix satellites. The suits have many layers of materials, and it is very difficult to work while wearing them. Outside the station on an **extravehicular activity** (EVA), the crewmember must wear the EMU and MMU (**manned maneuvering unit**) equipment that weighs 148 kilograms (about 326 pounds). On Earth, the space suit (EMU) weighs 113 kilograms (about 250 pounds). To practice on Earth, the astronauts work in a huge tank of water called a neutral buoyancy simulator. This simulator helps the astronaut learn to work while wearing the stiff, bulky suit. Scientists can float the astronaut and the equipment so that they can practice the tasks they will do when they are working aboard the space station.

After 90 days, the space station crew will prepare for the arrival of the new crew. Each astronaut will complete his/her chores, pack up, and get ready to go home. They will put on their flight coveralls for the return trip to planet Earth.

Activity

The mission team member will choose an astronaut and dress him or her for the work to be done.

QUESTIONS

What clothing is worm by astronauts while they are aboard the space station? What clothing is needed for each activity?

MATERIALS

1 Set of paper dolls with the space station wardrobes
1 Pair of sharp scissors

PROCEDURES

1. An astronaut is going outside the space station to repair a satellite. Find the astronaut and the clothes he or she will need.

2. Cut out each piece of clothing and equipment. Now dress the astronaut.

3. One astronaut has time off from work, and he is going to look out the window and take photographs. Dress this astronaut

4. One astronaut will be working in the laboratory. This astronaut will check an experiment. What will he or she wear? Dress this person for work.

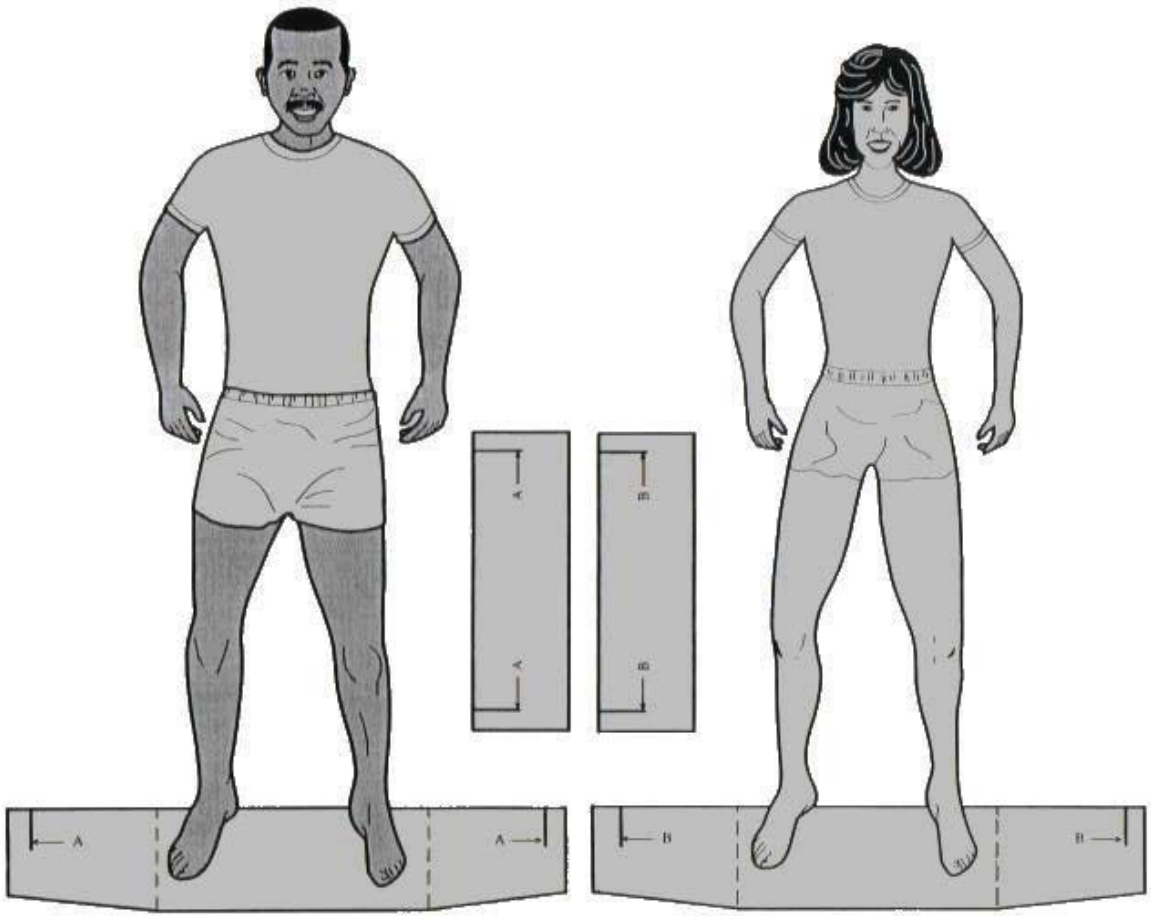
5. It is the last day of the 90-day tour of duty. One astronaut is getting ready to return to Earth. What will this person wear? Dress this astronaut.

6. Display each astronaut on the stand provided.

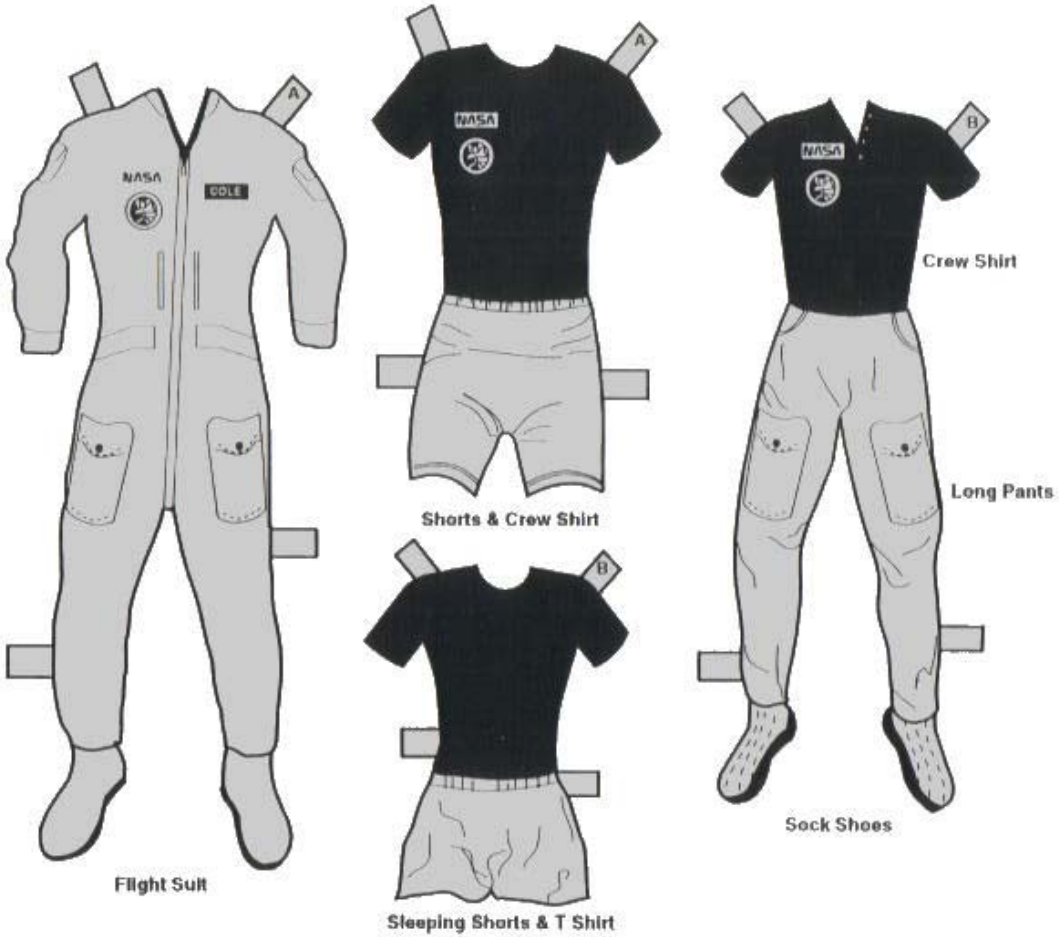
7. (Optional) Mission team members may wish to color the clothing provided for each astronaut.

The space suit and the underwear are white. Space clothing is usually white, light blue, or navy but Mission Team members may select their own colors.

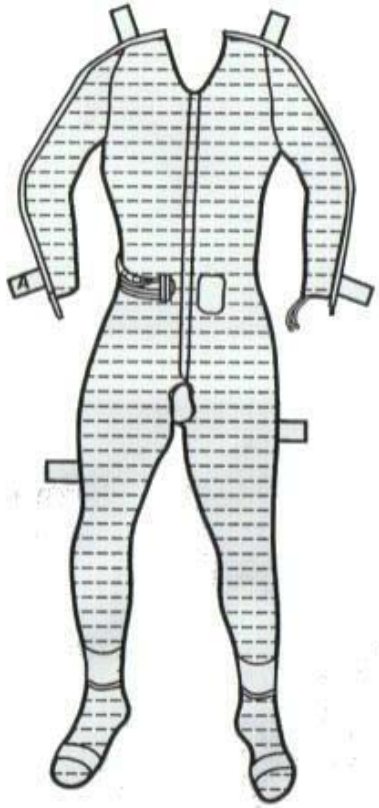
Space Station Astronauts

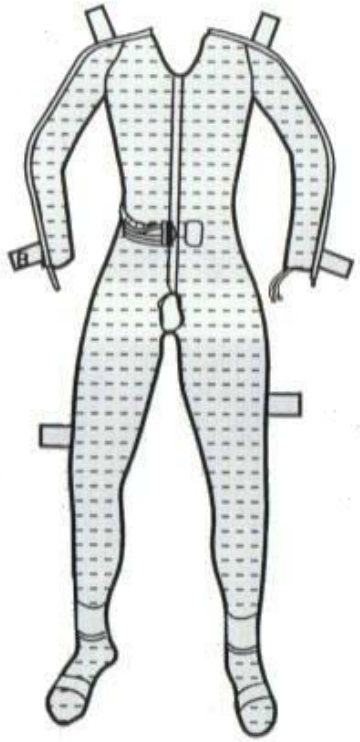
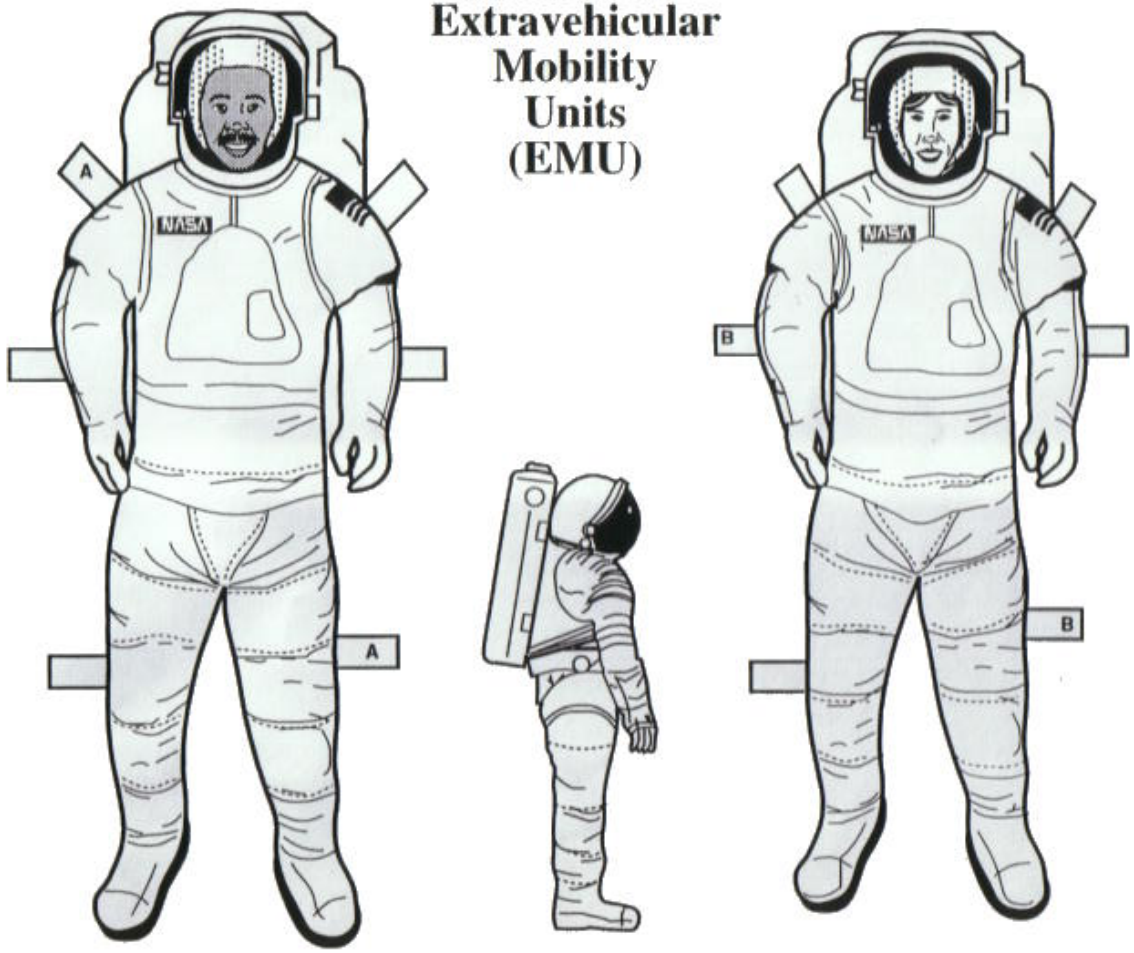


Space Station Clothing



Space Station Space Suit
Liquid Cooling and Ventilation Garments





Space Suits/ Extravehicular Mobility Units (EMU)