

# MUSEUM<sup>OF</sup> THE ROCKIES

## Living in Space: Practicing for Space

*Living in space is different than living on Earth, because of gravity.  
How do astronauts deal with the differences?*

### Gravity and Microgravity

Gravity is a universal force on Earth and affects everything. If you drop a cup of pudding on Earth, it falls to the floor. Without gravity, objects would float off into space.

If an astronaut drops a cup of pudding in the Space Shuttle or the International Space Station, it falls too, but doesn't look like it's falling. That's because the pudding, the astronauts, and the spacecraft are all falling together at the same rate, while at the same time traveling around the Earth. Since they're all falling, objects appear to be floating in a state of "microgravity" in which the effects of gravity seem reduced to almost nothing. Gravity tries to pull the spacecraft to the Earth, but it is traveling so fast that it falls around the Earth, in a path we call an "orbit."

Items such as food, science experiments, and exercise equipment must all be attached to the spacecraft so they don't float around in the cabins. Astronauts float too. When they want to stay still enough to eat, work, exercise, or sleep, astronauts hold onto one of the many handles or attach themselves to the spacecraft.

## Practicing for Space

Astronauts must wear protective clothing outside of their spacecraft. Protective clothing is bulky, so astronauts must practice tasks with their protective clothing on.

### Mission:

Learn to do a simple task while wearing bulky clothing.

### Experiment 1:

Step 1: Remove the puzzle pieces.

Step 2: Set the timer for 3 minutes.

Step 3: Using just your hands, put the puzzle together.

Step 4: Stop when the timer goes off.

### Theorize:

- A. How many pieces did you successfully put together?
- B. How difficult was it to pick up and place the puzzle pieces?

### Experiment 2:

Step 1: Remove the puzzle pieces.

Step 2: Now put on the astronaut gloves.

Step 3: Set the timer for 3 minutes.

Step 4: Using the astronaut gloves, put the puzzle together.

Step 5: Stop when the timer goes off.

**Theorize:**

- A. Now, how many pieces did you successfully put together?
- B. How difficult was it to pick up and place the pieces this time?
- C. How could you have made the task easier? Try Experiment #2 again.