



Sponge Spool Spine

Facilitator Background Information

Astronauts may seem to have a lot of fun in microgravity — doing flips in mid-air, pushing off effortlessly from one part of the spacecraft to sail to another part. However, there are some downsides for astronaut health!

Our bones form the support structure of our bodies, and our spines are an important part of our skeletal system. The spine includes 33 vertebrae that extend from our skulls to our pelvis. The bones are separated by thin pads of tough fiber (inter-vertebral discs). This inter-layering of bone and disk allows our spines to be flexible — letting us bend and twist, but still protecting the important nerves in our spinal cord.

Our bodies are adapted to Earth's gravity — that force that pulls us and every other object on Earth toward the center of Earth. This gravitational force compresses our spines; we do not sense the compression because we are used to it. But in microgravity settings like on the Space Station, this compressive force is no longer present — and our spines stretch! Astronauts actually grow 2 to 3 inches taller (5 to 8 centimeters) when they are in space!

While this might seem neat to become taller, it can actually cause them some pain; many astronauts have back pain while they are in space and the stretching can potentially injure nerves.

The height increase is not permanent. Once astronauts return to Earth, their spine compresses again in just a few days.