Sponge Spool Spine

Our bones form the support structure of our bodies. And a primary component is our spine – the 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. This gravitational force squeezes our spines; we do not sense the squeezing because we are used to it. But in microgravity settings like on the Space Station, our spines stretch! Astronauts actually grow 2 to 3 inches taller when they are in space!

You and your child will simulate what happens to a human spine in space by making a representation of a human spine on Earth, and then exposing it to "microgravity conditions."

What You Need:

- A tall, *clear* container, such as a water jug or 2 liter bottle with the top cut off, filled ¾ full with water
- A ruler
- 1 pencil (slightly sharpened)
- Scratch paper and writing utensil
- 1 pipe cleaner
- 3 small wooden spools
- 3 sponge pieces, about the size of a dime, each with a hole in the center

What to Do:

Invite your child to make a model of a spine. Do they have a spine? Where? What does it do for them?

- Place a small loop at one end of the pipe cleaner
- Thread the pipe cleaner through the center of the sponges alternating them with the wooden spools. Push them down toward the loop.
- Measure the length of all of the sponges and spools together
- Ask your child what they think will happen when the "spine" is dipped into the water. Will it grow? Shrink? Stay the same?
- Holding the end without the loop, dip the pipe cleaner with the sponges and wooden spools into the container of water
- Measure the sponges and spools again – did the length of the "spine" change?

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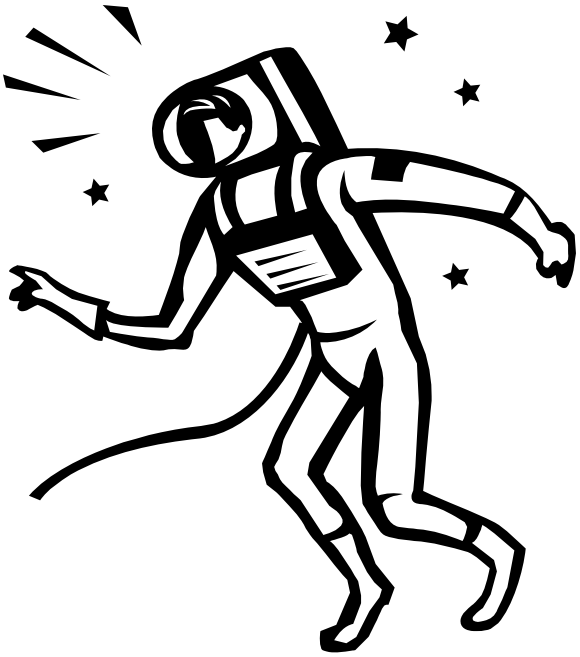
Parent Prompts:

What do the pipe cleaner, sponges, and wooden spools represent? (The spools represent the solid bone and the sponges are the flexible discs)

What happened to the sponges?

Why did the sponges expand?

The same thing happens to astronauts' spines – but not because they are dipped in water! Why do astronauts' spines s-t-r-e-t-c-h?



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