Curiosity Guide #306
Skeletal System

Accompanies Curious Crew, Season 3, Episode 6 (#306)

Broken Bones

Investigation #4

Description

How strong is a bone? You may be surprised!

Materials

- Several cleaned chicken-leg bones
- S-hook
- Bucket with a handle
- Assorted bricks or weights, 5 to 50 pounds
- Goggles
- Short chain, approximately 1 foot long
- Two desks or tables
- Duct tape
- Tape measure
- Clear bin

Procedure

1) Prepare the bones by boiling them to remove any meat. Soak the bones in 1 part bleach to ten parts water for five minutes. Let the bones dry.
2) Separate two desks or tables, leaving them 1.5 inches apart.
3) Place one of the bones over the opening and tape down the ends of the bone with duct tape.
4) Put on safety goggles.
5) Hang an S-hook on the bone.

6) Loop the chain around the handle of the bucket. Connect the chain to the S-hook so the bucket is suspended from the bone.
7) Turn the clear bin over the bone so that it can be visible but would catch anything if the bone were to break.
8) Gently begin to add weight into the bucket.
9) How much weight can the bone support without breaking?

My Results

Explanation

Bones have a hard, outer layer, which is generally smooth and extremely strong. The bones store calcium and phosphorous. The calcium salts combine with the collagen fibers to make bones rigid. Inside the bone is another tissue that is more sponge-like. Those honeycomb fibers help provide strength while still being lightweight, making bones stronger and lighter than steel. Amazingly, because human bones are denser than the chicken bones, they are also far stronger!

Explore further: Do you wonder what the innermost layer in your bones looks like? With a screwdriver, cut a notch into one of the chicken bones. The jelly-like substance in the center of a bone is called bone marrow. Every second, our bone marrow makes 2 million red blood cells.

Something else to think about: The bones in our skeletal system come in many shapes and sizes. We have long bones like the ones in our arms and legs, short bones like the ones in our wrists and ankles, flat bones like the ones in our ribs or skull, and irregularly-shaped ones like the vertebrae in our spines.

Vertebrates are animals that have a skeleton inside, and a backbone. These include mammals, fish, birds, reptiles, and amphibians. Other creatures like insects have skeletons on the outside, and some creatures like sharks have no bones in their skeletons at all, just cartilage, the same stuff in our nose or ears. Amazing!

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