BONES
EXPERIMENT

Bones are living, growing tissue. Calcium is a mineral that the body needs to keep bones strong and hard. The body gets the calcium it needs through the food that you eat. The calcium is stored in your bones and teeth. Sometimes the body will remove the calcium from your bones. Hopefully that calcium is replaced later, but that doesn't always happen. So, if we know that calcium helps to make bones hard, then what happens when the calcium is removed? Let's find out! Vinegar is a mild acid that is strong enough to remove calcium. If we soak a bone in vinegar will it remove the calcium?

Let's Experiment!

Materials

- Container with Lid
- Vinegar
- 2 Clean, Dry Chicken Leg Bones
- Safety Goggles
- Protractor

Instructions:

1. Wash your hands before beginning the experiment.
2. Put on googles.
3. Feel both bones to test for strength and hardness.
4. Put one bone in the container and set the other bone aside.
5. Add enough vinegar in the container so that bone is covered.
6. Seal the container – vinegar is stinky!
7. Wash your hands and remove the googles.

Now wait 5 days – then...

1. Put on goggles.
2. Remove the bone from the container.
3. Feel both bones to test for strength and hardness.
4. Use a protractor to measure and compare how much each bone can bend.
5. What effect did the vinegar have on the bone?
6. Wash your hands and remove your goggles

If the bones have not changed, continue the experiment and change out the vinegar.

So What Happened?

Well, the technical answer is that the acetic acid in vinegar reacted with the calcium carbonate in chicken bone to produce calcium acetate and carbonic acid. When calcium acetate, a calcium salt that is soluble in water, is formed it diffuses out of the bones and into the water component of the vinegar. Carbonic acid is not stable at room temperature, so it immediately breaks down into water and carbon dioxide gas, which is released as small bubbles that can be seen on the bones or on the container lid.

What Did We Learn?

When the calcium was removed from the bone, the bone became soft and bendable. So, if we do not provide enough calcium for our bones, then they will not remain strong.