



Gummy Worms

Make gooey, slimy worms!

Activity Guide

Try This!

SAFETY: The gummy worms are safe to eat only if you use food-grade chemicals and clean kitchen equipment to prepare them.

1. Put the sieve into the bowl of calcium chloride solution.
2. Squirt a stream of sodium alginate mixture into the bowl, making long, wormy strands.
 - Make sure you squirt inside the sieve so you can remove your worms easily.
 - Let the worms rest in the sieve for a minute.
3. Remove the sieve, and rinse the worms in fresh water. (Otherwise, they'll taste salty.)
4. Touch and taste the worms—if you dare!



What's Going On?

Your gummy worms are an example of a *polymer*, a large molecule made of repeating units.

The sodium alginate in the squirt bottle is made of short polymer molecules that can easily slide around each other inside the water. The calcium ions in the bowl cross-link these short polymers together into longer strands turning the stream of liquid from the squirt bottle into a thick gel.

***A polymer is large molecule
made up of repeating units***

Learning Objectives

- Polymers are large molecules made of repeating units.
- Short polymer molecules, like sodium alginate, can be joined into longer polymers.

Materials

- Sodium alginate mixture (*Requires advance preparation; see below*)
- Calcium chloride solution (*Requires advance preparation; see below*)
- Blender
- Squirt bottle
- Large mixing bowl
- Measuring cup
- Measuring spoons
- Sieve (mesh strainer) that nests inside the bowl

Food grade chemicals are available at www.willpowder.com.

Advance Preparation

Sodium alginate mixture

- Sodium alginate (food grade)
 - Flavored extracts (food flavorings)
 - Packet artificial sweetener
 - Food coloring (optional)
1. Put $\frac{1}{4}$ teaspoon sodium alginate in the blender.
 2. Add $\frac{1}{2}$ cup water.
 3. Blend.
 4. Add 1 tablespoon extract and packet of artificial sweetener.
 5. Blend.
 6. Optional: Add a few drops food coloring to make the color more intense.
 7. Pour into the squirt bottle. Label the bottle "sodium alginate."

Calcium chloride solution

- Calcium chloride
 - Mixing bowl
1. Put $\frac{3}{4}$ teaspoon calcium chloride in the mixing bowl.
 2. Add 2 $\frac{1}{4}$ cups water.
 3. Stir until dissolved.

Clean Up

Left over liquids can be flushed, **one at a time**, down the drain.

Credits

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