Curiosity Guide #501
Polymers

Accompanies Curious Crew, Season 5, Episode 1 (#501)

Growing Gummies

Investigation #3

Description

Big, bigger, biggest! Find out how to make gummy bears grow.

Materials

- Gummy Bears from Walgreens
- Distilled water
- Tap water
- Kosher salt
- Container with lid
- Clear cups
- Measuring cup
- Measuring spoons
- Digital scale
- Marker
- Ruler
- Plastic wrap
- Spoon

Procedure 1, Day 1: Prepare the solutions and gummies

1) Prepare the salt solution in a container. Combine 500 milliliters of distilled water with at least 180 grams of salt.
2) Put on the lid and vigorously shake the container.
3) Weigh the dry gummies in grams.
4) Measure the length and width of each gummy, using the ruler.

5) Fill three cups: one with distilled water, one with tap water, and one with the salt water solution you prepared earlier.
6) Label each cup with the name of the solution.
7) Place two gummies in each solution, cover with plastic wrap, and leave overnight.

Procedure 2, Day 2: Observe and record results

1) The following day, carefully spoon out the soaked, fragile gummies.
2) Weigh and measure each gummy.
3) How do the measurements compare to the starting measurements?

My Results

Explanation

Gummy bears are made of gelatin and sugar. The gelatin is a polymer whose structure consists of long, linked molecules. Candy makers use gelatin in making gummy bears because the long structure of the polymer molecules gives the gummy bears greater consistency.

When the gummies are submerged in water, the water is drawn into the center of each of the molecules. The water will continue to absorb into the gummies until there is an equal concentration of liquid both inside and outside the polymer. Weighing and measuring each saturated gummy can determine the increased volume and mass. When we compare the data of the gummies in different solutions, we find that the purer the water, the greater the change in mass and volume.
Explore further: Try shrinking the distilled-water gummy by placing the gummy in the salt solution overnight or leaving it out to let the water evaporate out.

Think about this! Did you know that polymers are all around us? It's true! In fact, anything made of plastic is a kind of polymer, and so are the proteins in hair, fingernails, or a shell of a tortoise. A few other examples of polymers include cellulose in paper, rubber and a really fun example, silly putty. But what do all these things have in common? If we could look at them through powerful microscopes, we would see that the molecules are like long, repeating chains bonded together. This structure makes it possible for polymers to behave in very interesting ways!

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