



Curiosity Guide #506

Bioplastics

Accompanies Curious Crew, Season 5, Episode 6 (#506)

Super Potato

Investigation #6

Description

It's a bird! It's a plane! It's...Super-Potato!

Materials

- Strips of potato bioplastic of different thicknesses. Note: Learn how to make potato plastic in Investigation #4.
- Binder clips
- Popsicle sticks
- Paper clips
- Wooden dowel
- 2 chairs
- Washers
- Scissors

Procedure

1. Cut the strips into similarly-sized dog bone shapes.
2. Sandwich pairs of popsicle sticks on either end of each strip and hold the sandwich together with binder clips.
3. Suspend a wooden dowel between two chairs.
4. Bend open a paper clip in the shape of an S-hook. Hang the S-hook on the center of the wooden dowel.
5. Hang the strip from one binder on the clip.
6. Bend open a second paper clip and hang it from the bottom binder clip.

7. Predict how many washers the assemblage will hold before breaking.
8. Hang washers one at a time to the bottom clip to see how much the assemblage can hold.

My Results

Explanation

Plastics are often tested for durability. One test measures tensile strength. In this test, the plastics are used to hold increasing amounts of weight to determine their strength. The plastic objects are often cut into a shape that resembles a dog bone. Sandwiching both ends of the dog bone with popsicle sticks and holding the sandwich together with binder clips allows the plastic to be suspended by the paper clips on a dowel between two chairs. You can test and calculate the number of washers the plastic can hold before it breaks.

Investigate further: Remember that plastics are made from polymers that are bonded together. One major difference between plastics and bioplastics are the bonds that connect the monomers together. Imagine a plastic bottle in the landfill. The bonds between those molecules are so strong that bacteria can't break those bonds down very well. That traditional plastic bottle could still be there in a thousand years!

In bioplastics, the bonds are much weaker and are made from natural materials that bacteria will be able to break down naturally. Because traditional plastics can last so long in a landfill, recycling them whenever possible is really important. As for bioplastics, our tests showed that although bioplastics are better at breaking down in landfills, they can still be quite strong!

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