Algae String Protocol



We use plastic objects every day. But what is plastic?

If we zoomed in for a closer look, we'd see that it's made of lots of long molecule chains called polymers. Most of today's plastics are made in a lab and are not environmentally friendly, but nature can make useful polymers, too. For example, natural rubber and paper are both created from natural polymers that are biodegradable. In this activity you will use polymers made by algae and a bit of chemistry to create your own custom string!



Polymer: A material made up of long repeating chains of molecules. It can be man-made (synthetic) or natural.

More about our algae polymer: The natural polymer that we're using in this activity is called alginate. It can be found in brown algae, like seaweed and kelp, which need to be both flexible and strong enough to withstand ocean currents and waves. When alginate is harvested and turned into a powder, the individual polymer chains are separated. Using chemistry, we can connect the polymer chains back together — like putting together the pieces of a puzzle — while shaping it into a fun and useful material.





Algae String Protocol

Step 1: Make a plan. Brainstorm with your group

Look through all the available ingredients. What are their properties? Which do you want to use to create your string? What different properties do you want to compare as a group? Record your plans on your data sheet.

Step 2: Make your algae gel

• Add your texture ingredient(s) and color(s) to 1/2 cup of water and mix to combine.

Use up to 3 tbsp of texture ingredients and up to 1 tsp of color. Take notes on the ingredients and amounts you chose on your data sheet.

- Add 1 tsp sodium alginate powder to your mixture and close the bag. Try to get all the air out of the bag before you seal it.
- Mix your ingredients until a gel starts to form.

You're done when the whole mixture becomes a thick gel. It's okay if there are still a few alginate clumps — they will continue to dissolve overnight.

Step 3: Make a calcium bath for your group

• Add 2 cups of water and 2 tsp of calcium chloride to your group bath container.

If you need more, add more of both ingredients at the same ratio until your bath is 2-3 inches deep. Record how much you used on your data sheet.

Step 4: Make your algae string

• Snip the corner of the bag and squeeze your algae gel into your calcium bath.

Start by cutting off just the point of the corner (1-2mm). Remember you can always make the hole bigger.

• Let your string sit in the bath until it is solid. Start with 2 minutes and add more time if needed.

Test your string! Give it a squeeze and if it isn't as solid as you want, put it back in the bath to soak longer.

Step 5: Record Your String Observations

• Observe your string right away and again after drying. See how your string changes over time.

Record your observations on your data sheet.

