

Polymers: Making Slime

A *polymer* is a chemical compound formed from long chains of the same molecule group. These chains repeat over and over. Polymers can be flexible, pliable and stretchy. Some polymers occur naturally—like silk, rubber, wool, or starch—and some are manufactured. Examples of manufactured polymers are plastic dive helmets, wetsuits, latex paints and chewing gum. How ridged, stretchy, or dense a polymer is depends on *crosslinks* between the molecule chains.

Try This!

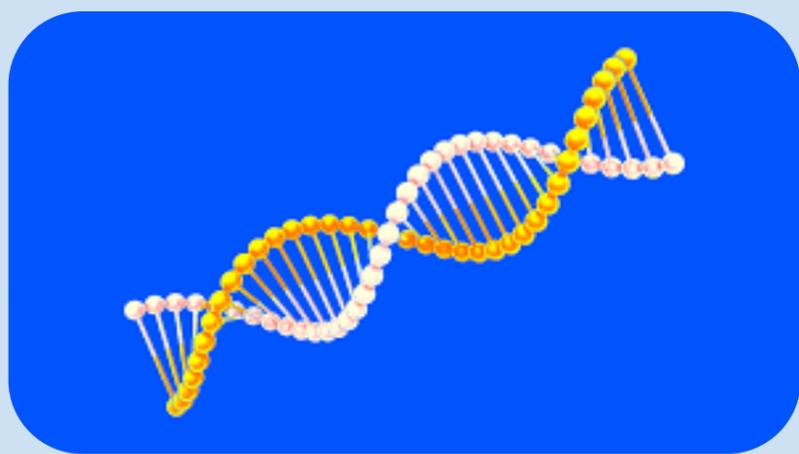
In this experiment, we are going to take a natural polymer (the latex in white glue) and form crosslinks which will make the glue stronger and stretchy!

1. Pour the 6 oz of glue into the bowl
2. Add the Baking Soda and optional water to the bowl and mix thoroughly. (You may also mix food dye here for more colorful slime)
3. Slowly add in your contact lens solution a little at a time, and mix as you go. Knead and mix thoroughly before adding more, as too much contact lense solution will make the slime too hard. You may not need the full amount so take this step slowly!

You're finished! Play with the slime— does it stretch? Can it bounce? How would you describe its differences from the glue you started with?

Materials

- Bowl
- 6 oz Bottle of Elmer's Glue
- 1/2 tsp Baking Soda
- 1½ TBSP of Contact Lens Solution containing Boric Acid and Sodium Borate.
- Optional: Use Gloves for mixing if you have sensitive skin
- Optional: 2 TBSP of water for a stretchier slime.



DNA is a type of polymer too! Can you spot the cross-links joining the two long molecule chains?

What's Happening?

When cross-links are formed in a polymer, its chains of molecules are connected in several places, producing a stronger and more elastic polymer. The glue you used is a type of polymer called polyvinyl acetate (PVA for short), while the borax in the contact lens solution is made of a chemical called sodium borate. When you combine the two in a water solution, the borax reacts with the glue molecules, joining them together into one giant molecule. This new compound is able to absorb large amounts of water, producing a putty like substance which you can squish in your hands or even bounce.

