

Time for Slime!

Chemistry is great for making many useful products. It's also good for making stuff that's just fun to play with. Let's make some slime!

What you'll need

- Goggles
- Elmer's glue, white or gel
- 20 Mule Team Borax
- Measuring spoons
- 2 small plastic cups
- Popsicle stick
- Water
- Food coloring (optional)



Be Safe

Put on your goggles. Be sure to read and follow all the cautions on the borax box label. Keep your slime away from carpets, fabrics, furniture, young children, and pets. Store it in a sealed zip-closing plastic bag when you are not playing with it and wash your hands after playing with your slime.

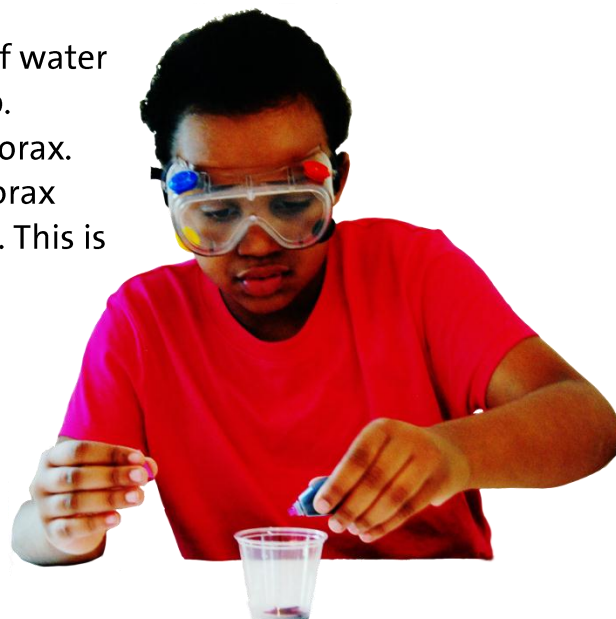


Here's what to do

Make the solutions

1. Place 1 tablespoon of water in a small plastic cup. Add $\frac{1}{4}$ teaspoon of borax. Mix until as much borax dissolves as possible. This is your *borax solution*.

If you would like your slime to be a certain color, add one or two drops of food coloring to your borax solution.



2. Place 1 tablespoon of water in another cup and add 1 tablespoon of Elmer's glue. Stir with a popsicle stick until the glue and water are thoroughly mixed.



Make the slime

3. Slowly pour all of the borax solution into the glue solution, and stir with a clean popsicle stick.

You should notice a sudden change in the solutions. Your slime is done when you can pick up your popsicle stick and most of the slime comes out on the stick.

4. When you have some nice thick slime, pull it off the popsicle stick and move it back and forth between your hands. The more you play, the less sticky it gets.



Experiment with the slime

5. Try pulling the slime very slowly to see if it stretches.



6. Form the slime into a ball and see if it bounces. You could put it over the bottom of an upside down cup and watch it slowly flow down.

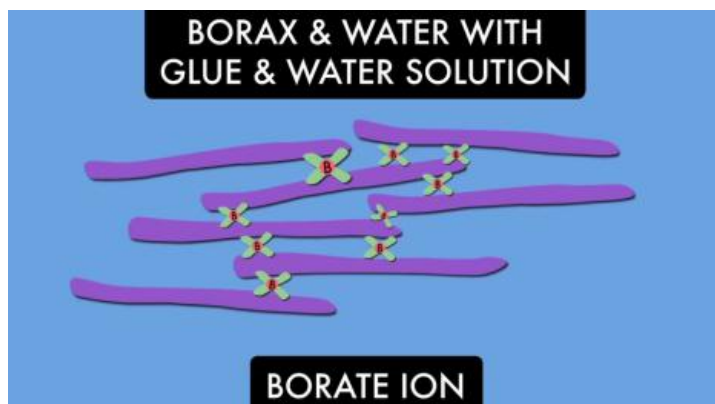
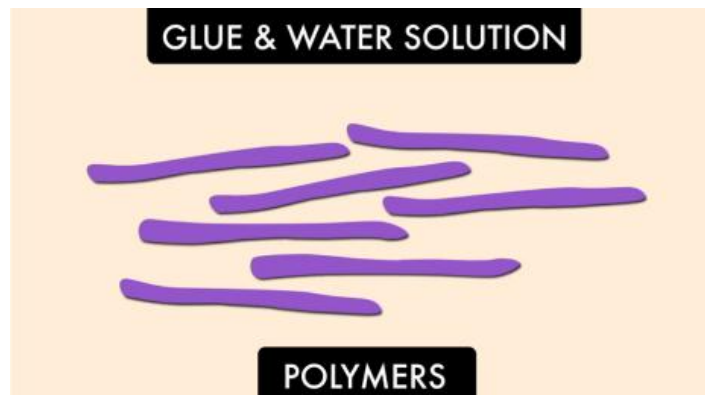
7. Try flattening your slime into a pancake and then holding it from one edge to see what it does.

What to expect

As you stir the borax and glue solutions together, the mixture becomes thick. It also attaches to the popsicle stick. When you pull slowly, your slime will stretch. However if you pull quickly it will break. Slime will slowly flow making it seem like a liquid, but it can also bounce which makes it seem a bit like a solid.

What's happening in there?

What makes slime so thick and stretchy? The glue has long flexible molecules in it called polymers. These polymer molecules slide past each other as a liquid.



Borax in water forms an ion called the borate ion. When the borax solution is added to the glue solution, the borate ions help link the long polymer molecules to each other so they cannot move and flow as easily.

When enough polymer molecules get hooked together in the right way, the glue solution changes from being very liquidy to a rubbery kind of stuff that we call slime!

What else could you try?

Water is an important ingredient in slime. Water helps the polymer molecules slide past each other so that your slime can flow. If you let the water evaporate, your slime will end up like a solid piece of plastic.



Try making other samples of slime with different amounts of water and compare them to your first piece of slime. In each sample, follow the instructions to make the slime that you followed before, but change the amount of water you add to make the glue solution.

- You could make the glue solution with little to no water. For example, use only 1 tablespoon of glue to make the glue solution.
- Or, add two tablespoons of water to 1 tablespoon of glue to make the glue solution.

You may choose to give each sample of slime a different color to help you tell them apart.