



Try This at Home Science:

All the Slime!

Activity Overview:

Learn about polymers by making non-edible slime 4 different ways!

Bonus: learn to make a supersaturated solution to use in this and other activities!

Slime Making Pro Tips

- The supersaturated borax solution described below can be used as the slime activator in any of the recipes.
 - Borax is inexpensive and can be purchased at any grocery store.
 - Borax solution can be replaced in any recipe with equal parts contact solution containing **boric acid** or **sodium borate**.
- Depending on the brand names of the ingredients you choose, recipes may vary slightly. Add all ingredients slowly and check the consistency of your slime as you go. The best way to check your slime is by using your hands to mix!
- If your slime feels sticky, add a few more drops of borax or contact solution.
- If your slime begins to feel hard, you've added too much borax or contact solution. Try mixing in a few drops of warm water to soften it up.

Step 1: Creating a Supersaturated Borax Solution (Activator)

Materials:

- 1 cup borax
- 2 cups water
- Cooking pot
- Stove (and adult supervision)
- Spoon
- Quart Mason jar with lid

Procedure

1. Bring 2 cups of water to boil in a pot on the stove.
2. Slowly add 1 cup of borax to the water until all of the borax has been added.
3. Stir until the borax has completely dissolved.
4. Pour into the Mason jar and let cool completely before capping for storage.

Safety Note: Borax is a chemical used frequently in cleaning and should NEVER be ingested. Adult supervision and assistance is highly recommended for this activity to ensure proper handling of the chemicals, and to prevent injury or ingestion of the slime.

Method 1 – Ooey Gooley Guar Gum Slime

Materials:

- 1 cup warm water
- 1/2 tsp guar gum
- 1/2 tsp baking soda
- Mesh sieve (optional)
- 1 tsp borax solution or contact solution
- Spoon
- Food coloring (optional)
- Medium size bowl
- Ziploc bag



Procedure

1. Add 1 cup of warm water into the bowl.
2. Use a mesh sieve to slowly sprinkle 1/2 tsp guar gum into the water, stirring well as you go. Add guar gum slowly to reduce clumps. Your final mixture should be the consistency of hair gel.
3. Add 3 drops of food coloring into the bowl (optional) and mix well.
4. Sprinkle 1/2 tsp of baking soda over your mixture and stir well.
5. Slowly add 1 tsp of borax solution or contact solution to the mixture.
6. Use the spoon to mix your slime until it thickens and sticks to the spoon.
7. Pick up your slime and have fun! Can you rip the slime? Does it bounce?
8. Store in a Ziploc bag for up to 1 week.

Method 2 – Fluffy Slime

Materials:

- 2/3 cup white Elmer's glue (it works the best!)
- 1/2 tsp baking soda
- 1/4 cup water
- 2-3 cups shaving cream
- 1 1/2 Tbsp borax solution or contact solution
- 3 colors of food coloring (Optional)
- 3 Medium sized bowls
- Spoon
- Ziploc bag



Try this!

1. Add 2/3 cup glue to the bowl.
2. Add 1/4 cup water and 1/2 tsp baking soda to the bowl. Stir well.
3. Add 2-3 cups of shaving cream to the bowl. Mix thoroughly.
4. If making multi-colored slime, split the mixture evenly between 3 medium sized bowls.
5. Add drops of food coloring to each and mix until the desired color has been reached.

6. Slowly add 1/2 Tbsp of borax or contact solution to each bowl and mix with your spoon for a few minutes. ****Note:** it will be sticky until the end of Step 7.
7. Slowly add another 1/2 Tbsp of activator solution to each bowl and continue to mix with your hands. ****Note:** if the slime is still too sticky, add a splash of activator solution and mix until it no longer sticks to your hands.
8. Have fun playing with the slime! Can you braid the slime? Can you mix the colors? What do you notice when you mix the colors too much?
9. Store in a Ziploc bag for up to a week.

Method 3 – Galaxy Slime

Materials:

- 1/2 cup clear Elmer's glue (replace with 6 oz colored glitter glue to skip food coloring)
- Red, Blue, and/or purple food coloring
- 1/2 tsp baking soda
- 1-2 Tbsp water (optional)
- Eco Glitter (optional)
- 1 1/2 Tbsp borax or contact lens solution
- 3 medium sized bowls
- Spoon
- Ziploc bag



Procedure

1. Add one 6oz container or 1/2 cup of clear Elmer's glue to the bowl.
2. Add 3-5 drops of food coloring, glitter, and 1/2 tsp of baking soda to the bowl and use a spoon to mix thoroughly.
3. To make the slime stretchier, add 1-2 Tbsp of water to the bowl and mix thoroughly.
4. Slowly add 1 Tbsp of contact solution to the bowl and mix for a few minutes. ****Note:** it will be sticky until the end of Step 5.
5. Slowly add the remaining 1/2 Tbsp of contact solution to the bowl and continue to mix with your hands. ****Note:** if the slime is still too sticky, add a splash of activator solution and mix until it no longer sticks to your hands.
6. Repeat Steps 1-5 in the 2 remaining bowls, but use different colors of food coloring (or colored glue) to make a total of 3 differently colored galaxy slimes!
7. Have fun playing with the slime! Bounce it, squish it, rip it, and mix the colors together. What do you notice?
8. Store in a Ziploc bag for up to a week.

Method 4 – Sensory Sand Slime

Materials:

- 1/2 cup white Elmer's glue
- 1 cup shaving cream
- Food coloring (optional)
- 1/2 cup sand (can be colored craft sand)
- 1 ½ Tbsp borax or contact solution
- Medium sized bowl
- Spoon
- Ziploc bag



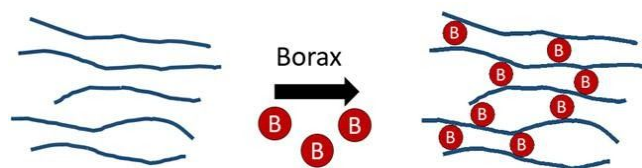
Try this!

1. Add 1/2 cup of glue to the bowl.
2. Add 1 cup of shaving cream to the bowl, use a spoon to mix thoroughly.
3. Add 1/2 cup sand and mix thoroughly. If desired, add another 1/4 cup of sand and use the spoon to mix until the desired consistency is reached.
4. Use your hands to continue mixing the slime.
5. Add 1 Tbsp borax or contact solution to the bowl and mix thoroughly. **Note: if the slime is still too sticky, add a splash of activator solution and mix until it no longer sticks to your hands.
6. Have fun playing with the slime! Does this slime act like the other recipes?
7. Store in a Ziploc bag for up to a week.

What's happening?

We made slime by connecting polymer chains together through a chemical reaction. In this activity, our main polymer is the white school glue. A polymer is simply a chain of connected molecules. Most of the time, these polymers do not stick to each other. This is why the glue in the container stays fluid. When those polymers interact with certain chemicals, they can stick together to create extra-long polymer chains.

When the supersaturated borax solution is added to the glue, the borate ions interact with the polymers in the glue and stick them together, creating our slime! But what about using liquid starch or contact solution? Why does that work? Again, there are borate ions in both solutions which interact with the existing polymers and stick them together creating slime.



Slime is not a solid or a liquid; it is what we call a non-Newtonian fluid. It defies Newton's Laws on how a material should act under pressure! It changes state depending on how much pressure is exerted on it. This means if we were to bounce the slime, the pressure from hitting the ground would make it hard like a solid, allowing it to bounce. However, if we gently pressed our finger into the slime, the soft pressure of our finger would make it soft like a liquid, and our finger would slowly sink.

Where else do we find polymers?

Polymers come in many forms, including gelatin! Gelatin is a colorless, natural, non-toxic, and translucent (see through) polymer that usually comes from the by-products of the meat or leather industry. Gelatin is used in many different foods like Jell-O, candies, potato chips, refried beans, marshmallows, French fries, and some salad dressings just to name a few.

The difference between gelatin and slime is the use of the borax solution, which is NOT EDIBLE. Gelatin is a protein and when it is heated, the protein strands unravel. As it cools back down in solution, it creates new bonds between the tangled protein chains, weaving them together like a ball of knotted yarn. This mass of bonded protein chains becomes firm, creating the gummy consistency we associate with gummy bears, Jell-O, and other chewy candies. Borax is a powdered soap and should never be ingested.



Now try...

- Test the density of your slime by placing different objects on top of your slime to see which ones sink and which ones stay on top of the slime.
- Bounce different slime samples and compare how well they bounce. Which recipe bounces the highest?
- Mix different slimes together. What do you notice? Did the consistency of the slime change? What about the texture?
- Take a pipe cleaner and fold it into any shape. Tie a string on the shape before lowering it into the supersaturated borax solution. Attach the string to the side of the jar and let sit for at least 48 hours.

Additional Information

Check out [ECHO Live! Episode 39](#) for a how-to video on making slime!

For more “Try This at Home Science” activities, visit www.mi-sci.org.