



Let's face it, Halloween—not to mention the entire school year!—isn't complete until you and your students make slime. There are several basic "recipes" you can try. The one you choose depends upon the topic and grade level you're teaching, as well as your classroom budget and available time.

## ELMER'S GLUE GAK



You probably have most of these ingredients already.

To make GAK, you will need:

- Elmer's white Glue-All
- Borax (sodium tetraborate)
- Water
- Two cups
- Plastic spoons or stirring sticks
- Food coloring (or phosphorescent powder\*) for glow-in-the-dark gak

### Steps:

1. It's easier to let students use two cups side-by-side, rather than mess around with measuring cups.
2. In one cup, pour about  $\frac{1}{4}$  cup of glue.
3. Pour an equal amount of water into the second cup.
4. Now pour the water into the glue. Stir well.
5. At this point, you might want to add 4-5 drops of food coloring, or better yet, phosphorescent powder if you want your gak to glow in the dark!

\* Educational Innovations sells **Glow-in-the-Dark Pigment** that can be activated by nearly any light source including sunlight, fluorescent, incandescent, and ultraviolet light.

6. In a separate cup, mix hot water and Borax until you have a saturated solution. You should explain to your students that a solution is “saturated” when you cannot dissolve anymore powder into it, even after stirring.
7. Now comes the fun part! While stirring the glue mixture, slowly add the Borax solution. The glue mixture immediately begins to clump and turns from a liquid into a putty-like solid. The more Borax solution you add, the harder the Gak becomes. This is because the sodium tetraborate is a cross linking agent that hydrogen-bonds with the long polymer molecules found in the Elmer’s glue.

## SLIME!



For making slime, many teachers swear by hot water soluble **Polyvinyl Alcohol Bags**. Typically, these bags are used in hospital laundry rooms; soiled linens are placed in the bags to reduce the chance that hospital workers will come into contact with contaminants. When the bag of soiled linens is thrown in the washing machine, the hot water dissolves the bag—exposing the linens to the water and detergent. When the water leaves the washing machine, so does the dissolved PVA.

### To make SLIME, you will need:

- Polyvinyl alcohol (PVA) bags
- Borax (sodium tetraborate)
- Water
- Food coloring (optional)



### Steps:

1. Dissolve the PVA bags in hot water. If you **purchase the PVA bags from Educational Innovations**, the appropriate amount is included in the directions.
2. Slowly stir in the same Borax solution used to make Gak. The basic difference between slime and Gak is textural and color. Gak is opaque while slime is more transparent, and slime tends to be a little thinner and less putty-like.
3. As with Gak, slime can be colored by using a couple of drops of food coloring before adding the Borax solution.

For those teachers who have less time to spare, Educational Innovations carries a **Classroom Slime Kit** that has everything you need premixed. All you have to do is combine the PVA solution and Borax solution and voila... instant slime!



# Experiments to Try

1.



Place your slime onto a flat surface and observe that it flows like a liquid. Try stretching your slime into a very thin sheet by holding it in your fingers and carefully stretching it sideways as it flows down. Roll it, then pick it up and let it hang to make a very long slime snake.

or

Break your slime into two pieces and then hold the two pieces together. See how long it takes the two pieces to join together into one piece again.

2.

Measure how fast your slime flows. Roll your slime into a ball and place it on a sheet of acetate. Use a marker to trace the shape of your slime onto the acetate. Trace it every minute or so and notice how it continues to flow outward... and don't forget to mark each trace with the time. After a few minutes, remove your slime and place your acetate over a piece of graph paper. Calculate the area of each contour by counting the number of boxes within each tracing. Graph the area of each trace verses time to get a graph of the flow rate. Try taping the acetate to an inclined book or board to speed up the flow of the slime.

3.

Try letting your slime dry out! Stretch your slime into a flat sheet and place it on a piece of plastic wrap. Let it dry for a couple of days, observing how it changes as the water it contains evaporates. Polyvinyl alcohol is a plastic, and as it dries it becomes hard and brittle.



4.

Try to rehydrate your slime. After letting your slime completely dry out, add a tablespoon of water and let it sit overnight. Notice, once again, how your slime changes.