

SLIME!!

Materials: White plastic cups, zip lock bags, Elmer's glue, sta flow (liquid starch), water, food coloring, and wax covered plates.

Preparation: For each student pour one plastic white cup amount of water in a ziplock bag, pour one white cup of glue, and one white cup of sta flow.

Procedure:

1. Give each student a bag of water, and a white cup of glue.
2. Have the students pour the entire cup of glue into the bag of water and add a couple drops of food coloring. Help them seal the bag with the glue and water so there's no air in it. Mix well.
3. As the students are mixing, go around and give each student a white cup of liquid starch.
4. Once the glue, water, and food coloring have formed a solution add the liquid starch. Seal the bag up well getting all the air out. Continue to mix the solution together. For best and fastest results pretend the bag is a cow's utter and act as though you were milking a cow.
5. After a few minutes of kneading and mixing, look at your bag and see if the slime as formed yet. As you see it form into a web like substance, take it out of the bag and use your hands to work it into a more uniform consistency.
6. When you are done playing with your slime, put it back into its baggie and store it in the refrigerator

Background knowledge:

"One variety of slime that can be easily made in the lab involves the addition of a saturated solution of sodium tetraborate decahydrate ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$), commonly known as borax, to a solution of white glue and water. White glue is an example of a polymer—it is made of long chains of polyvinyl acetate molecules. These chains slide past one another fairly easily, enabling the glue to be poured from the bottle. But when the borax is added to the glue, a highly viscous, very resilient form of slime is formed. This slime can be stretched, pulled, beaten, and shaped. This type of slime forms as a result of cross-linking between the protein molecules of the glue and the borate ions ($\text{B}(\text{OH})_4^-$) of the borax solution. Cross-linking involves the formation of bonds that tend to link together large molecules in such a way that they are no longer free to slide past one another. The large protein molecules in the glue already have trouble moving past each other; the glue has to be squeezed from the bottle, it doesn't gush out. The borate ions link the big molecules to each other, making even bigger molecules, and it becomes even more difficult for them to slide past one another. The result is a tangled mass that we know and love as slime."

More detailed explanation found here

<https://www.acs.org/content/dam/acsorg/education/resources/highschool/chemmatters/articlesbytopic/solidliquidsgases/chemmatters-dec2004-slime.pdf>

