

# Chemistry of slime

## Materials

Tip: Send your child on a scavenger hunt for the following items so they can complete the activity. See the last page for a list you can hand to them.

- 4 oz (120 mL) school or wood glue containing PVA (you can use clear glue or glitter glue in addition to white glue)
- Glass or plastic cup
- Liquid food coloring (neon colors make great slime)
- Two plastic spoons
- Paper towel
- Resealable plastic bag
- Water
- One of the below activator options:
  - Contact lens solution and baking soda (sodium bicarbonate)
  - Borax powder and water

## Preparation

1. Gather your materials
2. If using a borax solution as your activator, mix 1 teaspoon (4 g) of borax powder into  $\frac{1}{2}$  cup (100 mL) of water



## Activity

1. Add 4 oz (120 mL) of glue to a glass or plastic cup
2. Add 2–4 drops of food coloring to your mixture and mix with a plastic spoon until the color is evenly distributed
3. Add activator:

### Option #1: Contact lens solution/baking soda combo

- Using a spoon, add  $1\frac{1}{2}$  scoops of baking soda to the glue and mix with the spoon thoroughly
- Add 2 spoonfuls of contact lens solution to the cup and mix

### Option #2: Borax and water combo

- Add 2 spoonfuls of borax solution to the cup and mix
4. At this point, you will notice your mixture getting firmer; continue to add additional drops of contact lens solution or borax solution until you've reached your desired slime consistency
  5. Remove the slime from the cup with your hand and place it into a resealable plastic bag for storage
  6. Thoroughly wash your hands with soap and water

# The science behind the activity

Chemistry is the study of matter, which is defined as anything that has mass and takes up space. There are many different kinds of matter and they can be described using their properties. There are two different kinds of properties: chemical properties and physical properties. Chemical properties are qualities that can be observed during a chemical reaction, like when vinegar reacts with baking soda. Physical properties are qualities that can be observed with a physical change, like the melting of an ice cube (Figure 1). Physical properties can also be used to describe the state of some kinds of matter as a solid, liquid, or gas.

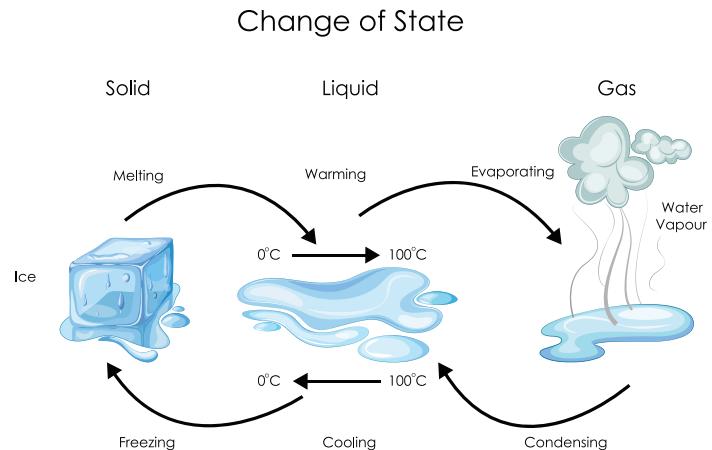


Figure 1

## Discussion questions

**What happens if you change the amount of one of the ingredients while making your slime?**

The unique physical and chemical properties of a mixture can be changed by varying the amount of each ingredient used to make them. Sometimes the amount of one ingredient compared to another can make a big difference. This is called a ratio. A ratio can be useful for determining how much of each ingredient to add to your mixture so you will end up with a mixture that has the properties you desire (Figure 2).

**How do the liquid and solid ingredients make something that is neither liquid nor solid?**

Slime activators (borax or contact solution) change the position of the molecules in the glue in a process called cross-linking. A chemical reaction occurs between the glue and the borate ions, and slime is the new substance formed (Figure 3). Cross-linking changes the viscosity or flow of the new substance.

**What makes slime stretchy?**

The polymers found within the glue are what allow slime to stretch. Polyvinyl acetate (PVA) molecules are very long chains of atoms that can easily pass by one another creating a liquid texture. When the slime activator is added, the PVA becomes cross-linked, and the molecules lose their ability to pass by one another easily.

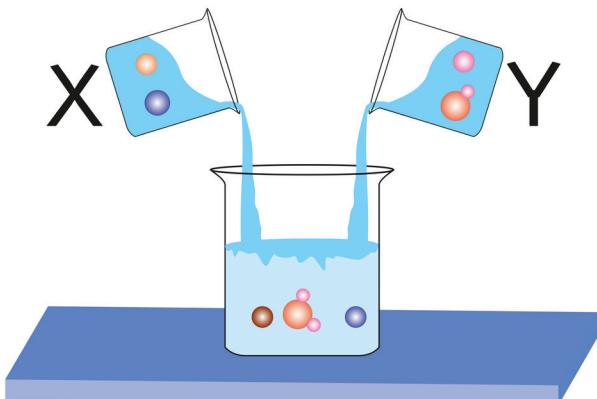


Figure 2



Figure 3

# Careers in chemistry

## Personality traits that make a good chemist

- Someone who likes learning and using knowledge to solve problems
- Someone who enjoys experimenting with materials
- Someone who enjoys math
- Someone who is curious about how matter works

## Careers as a chemist

- **Analytical chemist**—studies matter to determine its structure, composition, and nature, and the way substances interact with each other; some analytical chemists work in food safety, pharmaceuticals, and pollution control
- **Organic chemist**—studies molecules that contain carbon; some organic chemists even make new carbon-containing substances for everyday products, such as medications and plastics
- **Quality control (QC) chemist**—analyzes chemical raw materials and manufactured drugs to ensure they meet standards for safety, efficacy, and purity

## Careers with an education in chemistry

- **Manufacturing operator**—mixes and tests the final formulation of chemicals before they are sold
- **Sales person**—uses knowledge of chemistry to help customers identify the right products to meet their chemical needs
- **Marketing/product manager**—uses understanding of laboratory chemicals to identify end users and help them realize their need for a particular product

Chemistry helps us explain why some of the physical things in our world behave the way they do. It also helps us explain the biological processes—like converting sun or food into energy—that plants and animals use to grow and move. When chemical reactions contribute to pollution or someone gets sick with a disease, chemists can help us come up with environmentally friendly solutions and new medicines.

People who study and work in chemistry are coming up with ways to make the world healthier, cleaner, and safer for everyone.



# Scavenger hunt

Find the following items around your house so that you can complete this activity

- 4 oz (200 mL) school or wood glue containing PVA  
(you can use clear glue or glitter glue in addition to white glue)
- Glass or plastic cup
- Liquid food coloring  
(neon colors make great slime)
- Two plastic spoons
- Paper towel
- Resealable plastic bag
- Water
- One of the below activator options:
  - Contact lens solution and baking soda (sodium bicarbonate)
  - Borax powder and water

Find out more at [thermofisher.com/csr](https://thermofisher.com/csr)

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