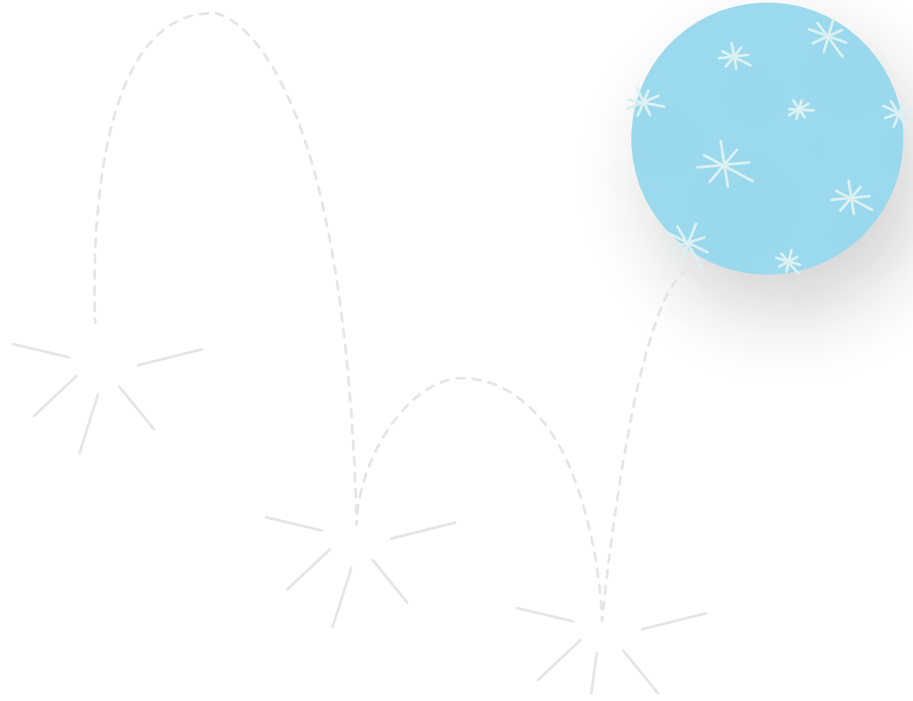


# Bouncy Balls

## Materials

- 2 bowls
- 4 tbsp. warm water
- 1 tsp. borax
- 1 tbsp. cornstarch
- 1 tbsp. liquid school glue
- Measuring spoons
- Craft stick or spoon
- Food coloring (optional)
- Glitter (optional)



## Combine your materials

1. In one bowl, combine 4 tablespoons of warm water and 1 teaspoon of borax. Stir to dissolve the borax.
2. Add a few drops of food coloring if you'd like to color your bouncy ball.

## Create the chemical reaction

3. Place 1 tablespoon of glue in a separate bowl.
4. Add  $\frac{1}{2}$  teaspoon of the borax mixture to the glue. Add 1 tablespoon of cornstarch. **Do not stir yet.**
5. Allow the ingredients to interact on their own for 10-15 seconds.
6. Mix them together with a craft stick or spoon until it becomes impossible to stir and forms a lump in the center of the bowl.
7. Take the lump out of the bowl and start molding it into a ball with your hands. The ball will start out sticky and messy, but will solidify as you knead it together.
8. If you'd like, knead in glitter to make a shiny bouncy ball!

**What happened?** When the borax and glue are mixed together, a chemical reaction occurs. The borax acts as a "cross-linker" to the polymer molecules in the glue – basically it creates chains of molecules that stay together when you pick them up. The cornstarch helps to bind the molecules together so that they hold their shape better.

## Bounce it

9. Once the ball is less sticky, go ahead and bounce it.
10. Does a big or small ball bounce highest? Does it bounce better on hard or soft surfaces? Does it bounce higher if the ball is warmer or colder?

## Clean up

11. Once you are finished, wash your hands, as well as the utensils and bowls.
12. Save your bouncy ball for later by storing it in a sandwich bag and placing it in the fridge.

## How does it work?

When you mixed the borax and the glue, the chemical reaction formed long chain molecules called polymers. Store-bought bouncy balls are made of rubber, another material that is made up of polymers. When the bouncy ball is stretched, these polymer chains uncoil and straighten. When released, the chains coil back up again. This makes the material stretchy and bouncy. When your ball bounces, it is squishing when it hits the ground, then un-squishing as it bounces back up.