

THE RUBBER MEETS THE ROAD

EXPERIMENT: FLUBBER AND BOUNCY BALLS

When you travel, you're often in a vehicle that uses rubber tires. Rubber is made of many different polymers, which are long chains of molecules. Link the polymers in glue together to create flubber (aka slime), then change the recipe to make a bouncy ball.

MATERIALS

- School glue (white or clear)
- Borax laundry additive
- Water
- Measuring cups and spoons
- Craft sticks or other stirrers
- Plastic cups
- Glitter, googly eyes, confetti (optional)
- Food coloring
- Bowls
- Wax paper



INSTRUCTIONS

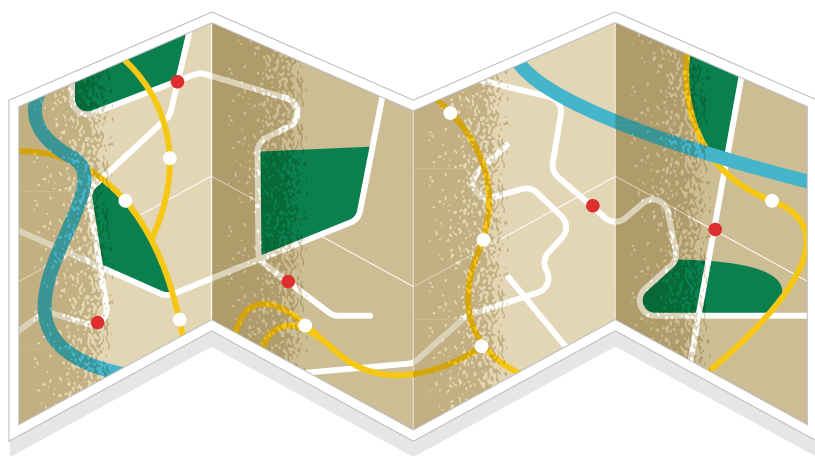
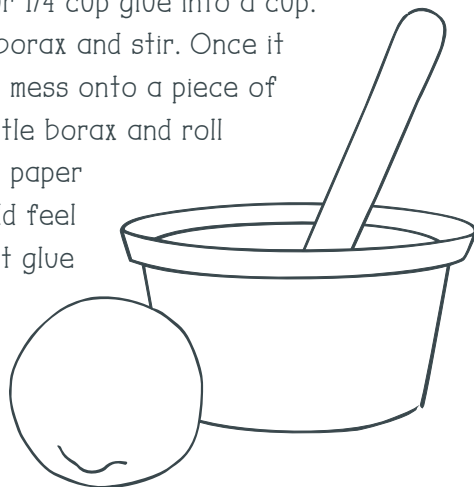
Measure 1/2 tablespoon of borax and put it in a cup or bowl. Add two tablespoons of water and stir. Not all of the borax will dissolve.

In another cup or bowl, measure two tablespoons of glue and add two tablespoons of water. Stir well. Add a few drops of food coloring.

Quickly pour the borax mixture into the glue mixture and stir rapidly. If you have a helper, one person can stir the glue while the other pours in the borax. The mix should instantly turn to flubber. If you would like, add some glitter or other small items to the flubber. Finish mixing by hand.



To make a bouncy ball, pour 1/4 cup glue into a cup. Mix in three teaspoons of borax and stir. Once it starts to solidify, dump the mess onto a piece of wax paper. Sprinkle on a little borax and roll the blob around in the wax paper to work it in. The ball should feel dense. Rinse the excess wet glue and borax off with some water, and give it a bounce.



GAME ON

Try making other flubber variations, like magnetic flubber. Add one tablespoon of iron filings to the flubber and work it into the mixture. Hold a strong neodymium magnet near the flubber and watch it move! Neodymium magnets and iron filings can be purchased online from science supply stores.

WHAT'S HAPPENING?

White glue is loaded with a type of chemical called a polymer. Polymers are long chains of molecules. Polymers are part of our everyday lives—fabrics like nylon and polyester are polymers. Proteins and fats in our bodies also are polymers. Natural rubber from trees is also a polymer. The polymers in glue just slide past each other, but adding borax causes a chemical reaction. Borax links those polymers to each other and connects them in a big network; this is called cross-linking. Now the polymers can't slide around and the mix solidifies into flubber.

TIPS

Borax is an irritant and should be kept out reach of children and pets. While safe in diluted solutions, borax can be harmful if ingested. To keep the flubber and bouncy ball from drying out, store them in zippered plastic bags.

LEARN MORE

Making flubber causes a chemical reaction. Make virtual chemical reactions with MSI's goREACT game and app: msichicago.org/goreact.

RECOMMENDED READING

Henry Ford for Kids: His Life and Ideas with 21 Activities
by Ronald Reis

Cars, Trains, Ships, and Planes
by DK Publishing

