Science Experiment:
Bouncy Balls
Project: Arts & Crafts, Science

Supplies:

- **Borax**
- **Warm water**
- **Cornstarch**
- **Food coloring**
- **Elmer's Glue**
- **Measuring spoons**
- **Spoons**
- **2 plastic cups**
- **Marking Pen**
- **Ziploc bag**

Time: 25 minutes

What to Do:

1. First everyone should write down their predictions. Talk about these in your groups to see what everyone thinks will happen.
2. Pour 2 tablespoons of warm water and ½ teaspoon of borax powder into one cup. Stir the mixture to dissolve the borax. Add food coloring, if desired. Label this cup "Borax solution".
3. In the second cup, pour in 1 tablespoon of glue. Add ½ teaspoon of the "Borax Solution" you just made and 1 table spoon of cornstarch. DO NOT STIR.
4. Allow the ingredients to interact on their own for 10-15 seconds and then stir them together to fully mix. Once the mixture becomes impossible to stir, take it out of the cup and start molding the ball with your hands.
5. The ball will start out sticky and messy, but will solidify as your knead it.
6. Once the ball is less sticky, you can bounce it!
7. Store your plastic ball in a sealed Ziploc bag when you are finished playing with it.
8. Do not eat the materials used to make the ball or the ball itself. Wash your work area, utensils, and hands when you are finished with the activity.

Reflect:

1. Why do you think we added glue to the bouncy ball mixture?
2. What happened once you started to knead the ball?
3. How high did you get your ball to bounce?
4. If you made another bouncy ball would you change the recipe? If so how?

Apply:

1. Balls have been toys for practically forever, but the bouncing ball is more recent of an innovation. Bouncing balls were originally made of natural rubber, though now they can be made from plastics and other polymers, even treated leather. You have no used chemistry to make your own bouncing ball. Once you understand the basic technique you can alter the recipe for the ball to see how the chemical composition affects the bounciness of the ball, as well as the characteristics. The bouncy ball in this activity is made from a polymer. Polymers are molecules made up of repeating chemical units. Glue contains the polymer polyvinyl acetate (PVA), which cross-links itself when reacted with borax.

Source: Utah State University Kitchen Science Discover 4-H Club