Make a Bouncy Ball

1. Pour 2 tablespoons hot water and 1/2 teaspoon borax powder into the cup labeled 'Borax Solution'. Stir the mixture till all the borax is dissolved.
2. Pour 1 tablespoon of clear or blue glue into a paper snack tray. [Add food coloring.]
3. Mix one tablespoon of cornstarch into the glue.
4. Add 1/2 teaspoon of the borax solution to the glue. **Do not stir.** Allow the ingredients to interact on their own for 15 seconds and then stir them together to fully mix. Once the mixture becomes impossible to stir, take it out of the cup.
5. Knead the ball by rolling it around in your palms. It's a sticky mess at first. Keep rolling till it starts to feel like a ball. (If it's still really sticky, sprinkle on just a little cornstarch and keep rolling.)
6. Once it's solidified, bounce it.
7. When you're done playing with it, put it in a Baggie – write your name on the baggie!

What's happening (for kids): the glue makes the ball strong. The cornstarch makes it bouncy. The borax helps cornstarch and glue stick together.

What's happening (For grown-ups): The glue contains polyvinyl acetate, a strong and flexible polymer that gives the ball strength. Cornstarch contains amylopectin, a polymer whose shape is best described as 'branched' - it sticks out like the branches of a tree - and gives the ball the property of elasticity. Elasticity allows the ball to return to its original shape after being compressed or stretched, such as hitting the floor. So instead of splattering everywhere, the ball bounces back up. The borax is needed to help the glue and the starch stick together. This connects the two polymers into a netlike formation, keeping the ball from crumbling or becoming slime when it is bounced.

Make Silly Putty

1. Put two tablespoons of all-purpose glue in a dish.
2. Add food coloring. Mix.
3. Add one tablespoon liquid starch. Stir.
4. Let sit for five minutes.
5. Knead for five to ten minutes.
6. When done playing with it, store in a plastic egg.

Oil and Water

1. Pour a small amount of oil in one jar. Pour a small amount of water in the other jar.
2. Put one drop of red or yellow food coloring in the oil. What happens?
3. Mix red or yellow food coloring in the water. What happens?
4. Mix a drop of blue Americolor into the oil.
5. Pour the water and the oil together. Mix together. What happens?
6. Let it sit. What happens?

What's happening? Water and oil don't mix. The red and yellow are water-based so they won't mix with the oil. The blue food color will bond with the oil (and the water). When you mix the oil and water, then let them separate, the oil floats to the top, because it is less dense than water.

Chromatography – What colors are really in that marker?

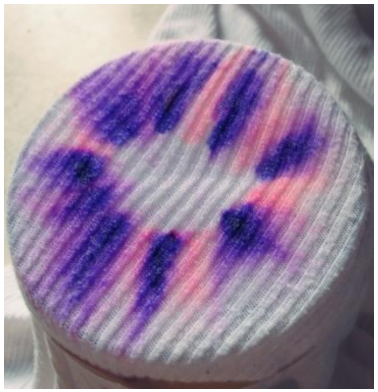
1. Use a marker to draw a line 1 – 2 inches from the end of a paper towel strip.
2. Dip the very end of the strip (below the line) into the water.
3. Lay the rest of the strip out on the tray.
4. Watch the water wick up and pull color along with it.
5. What colors do you see?

So, is black ink really just black? No! There's literally a rainbow of colour hiding in just one black dot! The burst of colour that you see on the filter paper proves that black is really a combination of colours. Chromatography is the science of separating mixtures. The black ink is actually made up of lots of different colours, and each different colour is a different chemical substance. As the water soaks through the paper the ink on the paper moves. Some substances will move far up the paper because they don't stick to the paper very well. Others will not move far at all because they are very good at sticking to paper. We can't use permanent ink in this test, because it has been developed to not dissolve in water, and therefore would not move up the paper. You could see what other colour inks are made of though!

Sharpie Tie-Dye

1. Color coffee filter with Sharpie.
2. Use pipette / eye dropper to drip on <u>just a little</u> rubbing alcohol.

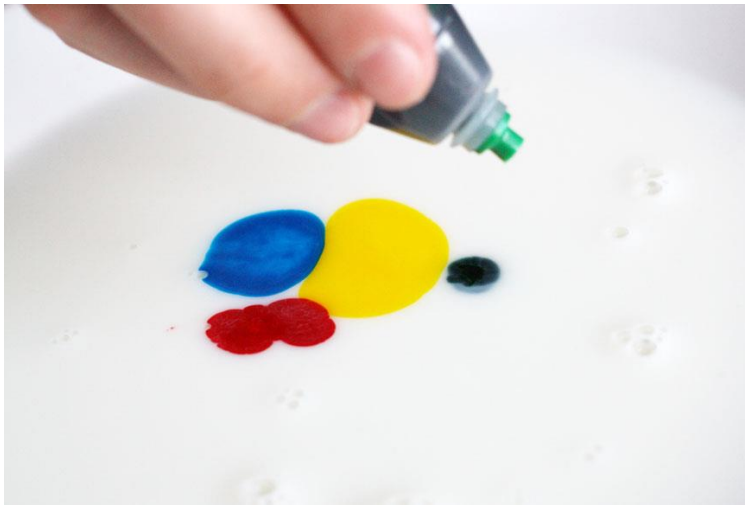





A solvent is any substance that dissolves a solute. A solute is any substance, gas liquid, or solid, that is dissolved by a solvent. Sharpies are hydrophobic. Hydrophobic, or "water-fearing", substances that will not dissolve in water. That's why permanent markers won't wash away with water. The ink molecules in the Sharpies, however, are soluble {they will dissolve} in a different solvent. The solvent {rubbing alcohol} you dropped over the dye dissolved the ink molecules and carried them with it as it spread across the filter.

Milk "Fireworks"

1. Pour a shallow layer of milk in the dish.
2. Put a dot or two of one food color, then another color, nearby but not touching.
3. Dip q-tip in detergent.
4. Touch q-tip to the surface of the milk. Hold it still. DON'T STIR!!
5. Watch what happens.



What's happening (grown-ups): Milk contains tiny droplets of fat suspended in solution. Detergent (nonpolar on one end and polar on the other), weakens the chemical bonds that hold the proteins and fats in solution. The soap's polar, or hydrophilic (water-loving), end dissolves in water, and its hydrophobic (water-fearing) end attaches to a fat globule in the milk. This is when the fun begins. The molecules of fat bend, roll, twist, and contort in all directions as the soap molecules race around to join up with the fat molecules. During all of this fat molecule gymnastics, the food coloring molecules are bumped and shoved everywhere, providing an easy way to observe all the invisible activity. As the soap becomes evenly mixed with the milk, the action slows down and eventually stops. Add another drop of soap to start the process again. [source: Steve Spangler Science]

Make a Bubble Wand

(we'll blow bubbles at outside time)