

## February 7 – Red Hands

With Valentine's Day coming up there seems to be red everywhere, so I thought that we could do an experiment that turns out red in the end. You have to make sure that you are careful doing this experiment and not touch anything; so try and stay in one place with a sink – like the bathroom or kitchen while you try this experiment. We are going to create a chemical reaction on our hands with a couple of simple household ingredients.

**\*Always remember to ask an adult before doing any Science experiment.**

### **Materials:**

Bar of soap

3 Ex-lax tablets

4 teaspoons rubbing alcohol

Jar with a lid

### **Procedure:**

1. Crush the Ex-Lax tablets up, you can easily do with by putting them on a hard surface and use the back of a spoon to press on them to crush them.
2. Place all the crushed pieces into the jar
3. Add the rubbing alcohol to the jar and screw on the lid
4. Shake the jar until the tablets are all dissolved.
5. Open the jar and carefully pour a little bit of the mixture on your hands and rub it in.
6. Let your hands dry. **Try not to touch anything!**
7. Wash your hands with the bar of soap, and watch what happens

### **Explanation:**

Your hands should have turned bright red. Ex-Lax has the chemical phenolphthalein in it, which is used as an indicator for acid/base reactions. In the presence of a base, phenolphthalein turns different shades of red, depending on how strong the base is. When you washed your hands with soap, you were washing with a base, as soap is often made from an alkali or base called sodium hydroxide. When the solution on your hands comes into contact with the soap it turns bright red.

Have a great week.

Erin Greggains

Regional Executive Director

Praxis the Science and Technology Hotline

## February 14 - Cake

This week we are going to make cupcakes to help us learn about chemical reactions, and how important it is to follow instructions. You will be using a hot oven so you will need an adult to help you when you bake the cupcakes and take them out of the oven, safety is very important in science.

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### Materials

Muffin tin or 4 mini loaf pans  
baking spray or oil  
measuring spoons  
small mixing bowls  
small cup

### **Ingredients (for one cake)**

6 tablespoons flour  
3 tablespoons sugar  
Pinch of salt  
2 or 3 pinches baking powder  
2 tablespoons milk  
2 tablespoons cooking oil  
1/4 teaspoon vanilla

Part of an egg (Break egg into a cup, beat until mixed. Use 1/3 of it, and save the rest for 2 of the other cakes.)

### Procedure:

1. Have an adult turn the oven on to 350 degrees for you.
2. Spray the muffin tin or loaf pans with baking spray.
3. Mix all of the dry ingredients together in your bowl
4. Add the wet ingredients (**only use 1/3 of the egg**). Stir until smooth and all the same color.
5. Added a few drops of food coloring to the batter, if you want to help keep the batters easy to identify.
6. Pour batter into 3 wells in the muffin tin, or one mini-loaf pan.
7. Make 3 more cakes, with the following changes. Leave the oil out of one. Leave the egg out of another. Leave the baking powder out of the third. Add food coloring to the batters if you want.
8. Look at the differences in the batters for each of your cupcakes.

9. Bake your cupcakes for 10-15 minutes. Stick a toothpick in the cupcakes to see if they are done, when the toothpick comes out clean they are done. Have an adult help you with this.
10. When the cupcakes have cooled, cut one of each kind of cupcake in half and look at the insides. Do they look different?
11. Taste your cakes, do they taste different?

### **Explanation**

When you mix the batter for the cake together it is like you are mixing a bunch of chemicals together to make a chemical reaction. When the liquid ingredients mix with the dry ingredients you get a mixture with different properties than the two mixtures before. You might be able to notice a slight difference between the batters before you bake them, the two without some of the liquids will be a little stiffer. When you bake the cupcakes the heat helps some chemical reactions to happen. The heat helps baking powder produce tiny bubbles of gas making the cake light and fluffy, in a process called leavening, this is why the cupcakes with out the baking powder should be flatter than the others, mine almost looked raw still in the middle, they were so heavy. It causes protein from the egg to change and make the cake firm, so these cupcakes should be squishy compared to the others. And oil keeps the heat from drying out the cake, these cupcakes will be drier than the others.

Have fun baking this week and learning about chemical reactions.

Erin GreggainsRegional

Executive Director

Praxis the Science and Technology Hotline

### **February 21 – Water and Alcohol**

I hope that everyone has enjoyed their break from school this week, for those who had it. This week for the experiment you are going to be using Rubbing Alcohol which is poisonous so you need an adult to help you with it, and you need to follow science safety rules which included, not smelling or tasting the chemicals that you are using.

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### **Materials:**

Masking Tape

Large clear Jar – big enough to fit two cups of water in  
Water  
Rubbing Alcohol  
Ruler  
Marker  
Measuring Cup

**Procedure:**

1. Tape two long piece of masking tape along the outside of your jar vertically; you want the tape to go from the bottom of the jar to the top.
2. Measure out two cups of water and pour them into the bottle.
3. Carefully mark on the one piece of tape the level of the liquid in the jar and mark it so that you know which one it is.
4. Dump the water out.
5. Measure one cup of water and pour it into the jar.
6. Measure out one cup of rubbing alcohol and pour it into the jar
7. Mark the level of the water and alcohol mixture on the other piece of tape.
8. Measure the levels of the liquids on the tape, are they the same?

**Explanation:**

When you had the water and rubbing alcohol mixture in the jar its level should have been lower than when you had just water in the jar, even though you put two cups of liquid into the jar both times. How can that be? The reason is that water has a lot of space between its molecules, and the alcohol molecules are small enough to slide in between the water molecules, making the total volume of the two liquids mixed together a little bit less. It's like sand filling in the spaces between rocks.

Have a great week!

Erin Greggains  
Regional Executive Director  
Praxis the Science and Technology Hotline

**February 28 – Flame Extinguisher**

A lot of times when I go out to do activities with groups, like brownie and spark groups, I take an activity similar to the one that I have for you this week. It uses the same “chemicals” in the same reaction, just a different way of showing the result. The kids really seem to like the one I take out, so I am hoping that you will like this version of it too.

**\*Always remember to ask an adult before doing any Science experiment.**

**Materials:**

Matches  
Candle  
Vinegar  
Baking Soda  
Spoon  
Bowl  
Play dough or Plasticine

**Procedure:**

1. Stick the candle to the bottom of the bowl using the play dough.
2. Sprinkle baking soda into the bowl around the candle
3. Have an adult light the candle for you.
4. Slowly and carefully add some vinegar to the baking soda, it will start to froth, make sure the froth stays below the candle.
5. Watch what happens.
6. Try to re-light the candle with a match, what happens

**Explanation:**

Adding the vinegar to the baking soda created a chemical reaction that puts out the flame on your candle. A flame needs oxygen to burn, when you added the vinegar to the baking soda they reacted together and produced bubbles of carbon dioxide gas, which fills the glass and covers the flame, removing any oxygen from around the flame, making the flame go out. When you try to relight the candle the match burns out as soon as it enters the carbon dioxide where there is no oxygen. The formation of gas is one of the ways that we can tell that a chemical reaction has occurred.

Have a great week.

Erin Greggains  
Regional Executive Director  
Praxis the Science and Technology Hotline