## January 3 - Sparks

I can't believe it is the New Year already, my how time flies by. This week we have an experiment with two parts to it, parts might look familiar to some people, I think that I used some of it as one of my very first experiments that I did for the paper a year and a half or so ago, but I know the other part is totally new. I love the sparks that the candies produce, and when I came across another way to make the sparks without the candy I was impressed, and knew that I needed to use it as one of my experiments.

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

### Materials

Wint-o-green Lifesavers® (*must be* the Wint-o-green kind and must have sugar)
Glass of water
Mirror
Roll of tape (any kind should work, but the stickier the better)
Dark room – as dark as you can make it

### Procedure

1. Go into a room that you can turn the lights off in and make really dark.
2. Unwrap the candy and put it somewhere you can easily get to in your room.
3. Start the roll of tape by pulling just a little bit off, and making a tab to pull on by folding a bit of the tape over. Put the tape in an easy access spot in your room too.
4. Turn the lights off in the room and let your eyes adjust, if there is light coming in from under the door or somewhere else try to block it as best you can, the darker the room the better.
5. Carefully put the candy into you mouth and with your mouth open, and looking into the mirror chew the candy – you need to be very careful when you do this that you don't choke. It is a good idea to have the glass of water ready in case you need to have a drink, or if the candy gets stuck.
6. Watch in the mirror and see what happens
7. Once your candy is gone, grab your roll of tape and quickly pull the tape off the roll. Watch carefully.

### Explanation

When you chew the candy up you should be able to see little sparks of light. If you can't see them let your eyes adjust more to the light and then try again and watch closely. The Wint-o-green Lifesavers® contain certain bonds in their chemical make up that give off light when they are crushed and torn apart. When you chew the candy you are breaking apart the bonds thus creating the sparks of light that you are seeing.
You should also be able to see sparks using the roll of tape, as you pull the tape off the roll quickly you are creating a strong positive charge at one end of the sticky adhesive and one end

with a strong negative charge. Electrons then jump from the negative end to the positive end quickly, causing the spark of light you see.
Both of these experiments use a property called trioboluminescence, to cause the sparks we see.

Have a great weekend!

Erin Greggains
Regional Executive Director
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## January 10 – Mixing Water

I hope that everyone had a great first week back at school, and for some work this last week. In the past I have done a some experiments that have worked because of density, different liquids weighing different, even though you have the same amount, but it has always been two different liquids, like oil and water, or alcohol, so this week I thought that we could once again look at density but using only a single liquid. How can one liquid have different densities you might ask, well read on and try this experiment to find out.

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### Materials:

Two identical small jars or glasses with wide mouths
Hot water
Cold water
Two different colors of food coloring
Squares of wax paper, or thicker paper
Scissors
Deep baking dish or a sink

### Procedure:

1. Fill one jar with hot water, and add a few drops of one food coloring, watch the food coloring in the water for a minute, then set the jar aside.
2. Fill the second jar with cold water, add a drop of the second food coloring, watch it for a minute too, and then set the jar aside.
3. Cut a square of wax paper that is about 10 cm x 10 cm
4. Slowly add more cold water to the cold water jar until it is full, so full that there should almost be a bubble on top of the jar of water.
5. Gently lay the square of wax paper on top of your cold water jar, and gently tap it to form a seal with the water and the jar.
6. Place your hot water jar in the baking dish.
7. Take your cold water jar, and quickly turn it over so that it is upside down, you will definitely want to be over the baking dish while doing this. Gravity will hold the wax

paper in place so you don't need to hold it. You might want to practice with some plain water first.
8. Put the upside down jar on top of the hot water jar.
9. Get someone else to hold onto the jars while you pull the wax paper out from between the jars, you need to do this slowly and carefully.
10. Watch what happens.
11. Try doing the experiment again with the cold water jar on the bottom and the hot water jar filled over.

**Explanation:**

You should notice that the water mixes together a lot faster when the hot water is on the bottom. This is because when you heat up water the molecules start moving faster and faster, meaning that there is more space between the water molecules, making hot water less dense than cold water. Because the hot water is less dense it weighs less, so when you put the hot water on the bottom and the cold water on the top the hot water quickly rises through the cold water, mixing your two colors together.
When you put the hot water on top, it stays on top because it is lighter than the cold water and so y our two colors of water don't mix.
What would happen if you added salt to one of your jars? Try it and see.

Have fun exploring this week.

Erin Greggains
Regional Executive Director
Praxis the Science and Technology Hotline

## January 17 - Dip Your Finger

I have been doing a lot of planning for the Kiwanis Regional Science Fair, which will be held Saturday March 21 at the Medicine Hat College, this year, so I wanted to take a look at one of the components of a science fair project today with our experiment. You are going to make a hypothesis this week as you go through the experiment. A lot of times I have you think about what is going to happen when you do an experiment, but this week we are going top write it down as an actual hypothesis for our experiment. Your hypothesis is one thing that judges look for when you do a science fair project.

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**Materials:**

Two drinking glasses
Water
Pencil (the best is one with flat sides on it)
Wooden ruler
Tape

**Procedure:**

1. Tape the ruler to a level surface, with one of the flats sides flat on the table.
2. Balance the ruler across the pencil.
3. Fill both glasses about 3/4 full with water, you want them to have the same amount of water.
4. Balance the glasses on opposite ends of the ruler; you don't want the ruler touching the table on either end.
5. Think about what will happen if you dip your finger into one glass of water, and why you think it will happen. This is your hypothesis, write it down.
6. Now dip one finger into one glass of water, make sure you don't touch the glass. What happens?
7. Pull your finger out and dip it into the other glass of water. Watch what happens.

**Explanation:**

First I had you make a hypothesis, which is your best guess as to what will happen when you try an experiment. You then run your experiment to test your hypothesis. If your hypothesis is correct great, if not, you should try and find out why you guessed wrong.
In this experiment, you made a very simple scale first to compare the mass of tow objects, the glasses of water. It is a simple scale as it won't give you the mass of the objects it just tells you if one object is heavier than the other. You start of by making sure that the glass of water are balanced on the scale, and that neither one is touching the table.
When you just dip your finger into the glass of water, that glass goes down, it seems to get heavier. When you dip your finger into the water it displaces some of the water, pushing it aside, and the water level raises. The combination of your finger in the water, and the displaced water increases the volume in the glass, which in turn acts like you added water to the glass. This increases the mass of the water in the glass with your finger in it and it drops to the table on your scale.

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## January 24 - Strong Eggs

This week we are going to look at the strength of eggshells, it is a fun quick experiment to show us that things may not always be as they seem. You may not realize just how strong an egg shell is or why. But when you think about it, they do have to be strong to support the momma when she is sitting on the eggs, so they don't break. Have fun seeing how much you can get an egg shell to hold.

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**Materials:**

Eggs shells (you need at least 4 halves)
Masking tape
Scissors

Cans, books, or something else to use as weight

**Procedure:**

1. Wrap a piece of masking tape around each half piece of egg shell, at the cracked edge. Then use your scissors to cut around the shell making a nice smooth edge. Do this to all 4 shells, you want to make all 4 egg shells as close to the same size as possible.
2. Place your 4 egg shells, dome side up on a table or the floor, making a square with them.
3. Make a hypothesis as to how much weight you think the egg shells can hold before they break. Do you think it is one can or book, or maybe two, maybe even five. Take your best guess.
4. Carefully start putting the cans or books on them, one at a time until an egg shell cracks.
5. How much weight did your egg shells hold?

**Explanation:**

You were probably surprised at how much weight your little egg shells could hold. Their strength comes from their shape, a dome shape, which is kind of similar to a triangle, which is the strongest shape. When you are putting the weight on the egg shells the dome shape disperses the weight to all parts of the shell, so no one point on the egg shell is supporting all the weight. When you crack an egg, it cracks easily because you do it on the side where the walls are fragile, and not the strong dome shape, and you apply a quick strong force to the weak point so it breaks. You can also try holding an egg in your hand and curling your fingers around the egg and carefully squeezing, seeing how hard you have to squeeze before you break the egg. If you try this you should have an adult's permission to waste an egg and do it over the sink or garbage.

Erin Greggains
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## January 31 – Coin vs. Paper

This week for our experiment I have a bit of a challenge for you, but in order for it to work out properly, you need to read the procedure in order, and not read the next step until you are ready to. We are going to look at air resistance this week, and the whole point of the challenge is to see if you can figure out an answer to the problem that I present to you. A problem is another component of a science fair project that you need, what you are trying to figure out with your experiment.

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

**Materials:**

Quarter or another bigger coin
Paper

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Scissors

**Procedure:**

1. Cut a piece of paper so that it is a little bit smaller than your coin, you want to make sure that no paper will stick out around the coin when you hold them up together.
2. Here's your challenge, try and find a way to drop the coin and the paper at the same time from the same height and have them hit the floor at the same time. Try to figure out a way before you read on.
3. There are two ways that it can be accomplished. The first way: Put the paper on top of the coin and rub it a bit making sure that no point of the paper stick out over the coin, and that there is no air between the coin and the paper. Now drop them. The second way, put the paper under the coin, again making sure no paper sticks out and then drop them, you will have to be quick to get your fingers out from under the coin without moving the paper. Try and keep the coin as level as possible when you drop it.

**Explanation:**

This experiment works because of air resistance, which is the amount of friction the air exerts on an object. The amount of air resistance on an object depends on the shape of an object and its speed. A smooth object that has a streamline shape will have less air resistance than a bulky rough object. The paper flutters to the ground slowly, because the air resistance acts against gravity. The coin falls to the ground faster because its weight counteracts the air resistance. If you place the paper on top of the coin properly and have very little air between them the coin shields the paper from the effects of air resistance and the paper falls smoothly to the ground with the coin. When you put the paper under the coin, the coin pushed the paper to the ground as it falls, counteracting the effects of air resistance that way.

Erin Greggains
Regional Executive Director