

## October 4 – Fall Leaves

I love this time of year, with all the leaves changing color and falling to the ground, even though I don't necessarily like what is coming next, but the fall colors are worth it. Why do leaves change colors exactly? Hopefully this weekend you can still find a few green leaves and try this experiment to find out.

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

### **Materials:**

Green leaf  
Coin  
Coffee filter  
Scissors  
Pencil or straw  
Tape  
Rubbing alcohol  
Glass

**\*Be extra careful with the Rubbing alcohol it is poisonous!**

### **Procedure:**

1. Cut the coffee filter paper so that you have a strip of it a little bit longer than your glass is tall.
2. Place the strip of filter paper on a flat surface
3. Lay your leaf on one end of the paper.
4. Roll a coin back and forth over the leaf about 3 cm up from the end of the filter paper; you want to leave a nice green line of leaf material on the filter paper.
5. Let your filter paper sit for a few minutes for the leaf material to dry.
6. While your filter paper is drying, carefully pour some rubbing alcohol into the glass, you want about 2 cm in the bottom of the glass.
7. Tape your filter paper to your pencil, so that you can use your pencil as a holder across the top of the glass to hang your filter paper into the glass.
8. Put your filter paper into the glass, you want the bottom of the paper in the rubbing alcohol, but you **don't** want the green line to be in the liquid.
9. Let your experiment sit still for a few minutes and watch what happens as the alcohol moves up the filter paper.

### **Explanation:**

We are once again using chromatography (it is a way to separate colors) to see different colors. The different colors that we see from the leaf are because of the different chemicals in the leaf. The leaf looks green because of chlorophyll which is prominent in the leaf when it is alive, the

leaf needs to be green so that it can make its food. In the fall the chlorophyll breaks down, letting the other chemicals show their colors, and letting the leaves change color.

Try this with a couple of different leaves from different trees and see what different colors come out.

Have a great week

Erin Greggains

Associate Executive Director

Praxis the Science and Technology Hotline

### **October 11 – Hot Water**

As the weather starts cooling off, I have been drinking more hot chocolate and tea, and it never fails I manage to burn my tongue more often than not. Why is that, even when I leave my drink to cool off for a while before I try and drink it? This week I have an experiment that will show you exactly what happens, and why if you are like me, you burn your mouth.

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#### **Materials:**

Hot water (be very careful so that you don't burn yourself)

Cold water

Large Jar

Small Jar

Food Coloring

String

Scissors

#### **Procedure:**

1. Cut a long piece of string and tie it firmly around the neck of the small jar, making a loop you can hold onto.
2. Fill the large jar with cold water, until it is about  $\frac{3}{4}$  full.
3. Fill the small jar with hot water, and quickly stir in a few drops of food coloring, you want to have a rich color. You might want to have a parent help you out with the hot water.
4. Hold the small jar by the string loop, and lower it gently into the cold water in the large jar.
5. Watch what happens to the water.

**Explanation:**

Water rises and expands when it is heated; this is why the hot coloured water rises up to the top of the large jar. This explains why the top layer of a hot drink is really hot when you are drinking it, the hot water stays at the top and the cooler water stays at the bottom of the drink.

Have a great Thanksgiving!

Erin Greggains  
Associate Executive Director  
Praxis the Science and Technology Hotline

**October 18 – Copying Pictures**

I am not an art person, that is probably why I like science so much, and chose it as a career not art, but when I find something that can help me to draw I like to try it out. This week I found an experiment that can help you reproduce pictures using a bit of science.

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

**Materials:**

A picture to copy  
A piece of glass, about the size of a piece of paper, the glass from a picture frame is a great size  
A piece of paper  
Desk lamp  
Pencil

**Procedure:**

1. Put your picture and paper side by side on a table
2. Put the lamp on the table and turn it on, point the light directly on your picture
3. Hold the glass up between the picture and blank paper.
4. From the picture side, look through the glass and you'll see a copy of your picture on the blank paper. Move your head around slowly until you get the best image.
5. Hold the glass and your gaze steady and you can now trace your picture.

**Explanation:**

How can you see something that isn't really there, like you are seeing the copy of the picture? It is quite simple, light reflects off the picture. Most of it bounces off in all directions, but some of it is reflected off the glass and into your eyes. This reflected light enters your eye, and you see the picture as if it were on the paper. Because of this moving your head changes the way that you see the picture, making it bigger or smaller or disappearing all together.

If you are looking for something to do today, please come up to Medicine Hat High School and join in the fun at the Praxis Family Science Olympics. They are running from 10 until 3 in the Taylor Science Center (enter the school off of 5<sup>th</sup> Street). There are 10 hands on events for families to try out, and lots of prizes to be won. All you need is one person over 18 to come with, and you can have lots of fun! Hope to see you there.

Erin Greggains  
Associate Executive Director  
Praxis the Science and Technology Hotline

### **October 25 - Buildings**

Here is an activity that we had at the Annual Praxis Family Science Olympics last weekend, the kids seemed to really enjoy it, so I thought that I would use it this weekend as my experiment. Do you ever look at buildings as they are being built and see what shapes are being used. Next time you are out and notice a new house being built look at what shape the roof is, they are made of one shape, which is stronger than others. Try this activity to find out what shape it is.

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#### **Materials:**

Package of toothpicks  
Miniature marshmallows  
A hardcover book

#### **Procedure:**

1. Using the toothpicks as beams and the marshmallows as glue, try to build a tall structure using nine marshmallows and 15 toothpicks.
2. Now try building with 15 marshmallows and nine toothpicks. Which structure is stronger? When you look at the stronger one, do you see more triangles?
3. Using 14 marshmallows and 20 toothpicks, try to make a structure that's strong enough to hold the book.
4. Now use a many marshmallows and toothpicks as you need to build a bridge between 2 chairs that are 30cm apart, and that can hold up your book, or some other weight.

What shape is the strongest? Which one is the weakest?

#### **Explanation:**

You should find that triangles are the strongest, and rectangles a pretty weak. Triangles are the strongest because you can't change it's shape without making one of the sides longer, or breaking it apart, but you can change a rectangles shape by pushing on one of its edges or

corners, and it will bend and change. You can make a rectangle a lot stronger by adding a triangle to it.

Triangles are used in lots of buildings, even though we can't always see them, they are also used in bridges to keep them strong.

Have fun experimenting with shapes and making strong structures this week.

Erin Greggains

Associate Executive Director

Praxis the Science and Technology Hotline