



# Frontenac, Lennox & Addington Science Fair

*Expo-sciences de Frontenac, Lennox & Addington*

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## Prefair Report

**1202**      **Mary Snider**

**Div/Cat**    **Physical and Math / Primary**

**Title:**      **Sweet Science of Sugar Crystals**

**Summary:** My project is about using different types of sugar to grow sugar crystals (a.k.a. Rock candy). I will be using four different types of sugar which are demerara style brown sugar, golden yellow sugar, icing sugar and fine granulated white sugar (plain white sugar). I will (with help from an adult) boil 2 cups of sugar in to 1 cup of water, take it off the stove and add 1tbs of extra sugar, stirring until all dissolved. then will boil until any extra sugar dissolves on stove. i will repeat this for the next three sugar types. then i will let the the sugar-water solution cool down for five minutes and then i will place it in an 8 ounce mason jar. if i decide to add food colouring i will do it now. then you place a wooden skewer in the each mason jar after adding the solution. make sure that the wooden skewers are around 1 centimeter off the bottom of the mason jar. very, very, very careful move each of the mason jars to a place where they will be undisturbed for one week. make sure to check on them every two or three days. after two weeks, take them out of the jars and weigh the crystals which ever was the heaviest is the biggest one.



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## Prefair Report

**1203**      **Marissa Bullock**  
**Div/Cat**    **Physical and Math / Primary**  
**Title:**      **Sugar in a Cookie**

**Summary:** Question

For my science fair project, I am researching the best sugar combination for a chocolate chip cookie recipe. To test this, I will be modifying the types of sugar in a chocolate chip recipe. The general recipe that I use will be the same, which means that the amount of flour, baking soda, margarine, and oil will be that same, but the type of sugar I use will be different. The first batch of cookies will be made with 3/4 cup of white granulated sugar, the second recipe will use 3/4 cup of golden brown sugar, and the last recipe will use 1/4 cup of white granulated sugar and 1/2 cup of golden brown sugar. By using different amounts of sugar I am going to see which sugar or sugar combination produces the best cookie. I will compare the cookies for appearance, does it look good, and texture, is it dry, crumbles, hard, soft.

Hypothesis

I think that the cookie made with brown and white sugar will be the best cookie overall. I think that the cookie with white sugar will be the lightest in color. The best cookies are cookies that are soft and hard. I think that the cookie with white sugar will be hard and crumbly. The cookie with the white and brown sugar will be soft and a good colour. That is why I think the white and brown sugar cookie will be the best.

Unchanged Baking Ingredients - Controlled Variable

1/2 cup margarine  
1 1/2 cups flour  
1 teaspoon baking soda  
1 teaspoon vanilla  
1 tablespoon water  
2 tablespoons vegetable oil  
1 cup chocolate chips

Changed Baking Ingredient - Independent Variable

Test 1: 3/4 cup of granulated white sugar

Test 2: 3/4 cup of golden brown sugar

Test 3: 1/4 cup of granulated white sugar  
1/2 cup of golden brown sugar

Results



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The brown sugar was the darkest. It was a semi flat ball. It was hard on the outside and soft and fluffy on the inside. It did not crumble too much when i broke it.

The white sugar cookie, was really light. It was a big ball and did not look like a nice flat cookie at all. It was hard on the outside and It was a little fluffy on the inside. The inside was the hardest out of all three of the cookies. It was really crumbly when i broke it apart. This cookie looked really dry and did not look good.

The brown sugar and white sugar cookie was perfectly flat. The colour was medium dark. It was not as dark as the just brown sugar, but it was darker than the just white sugar. It looked the most like a cookie. It was hard on the outside and soft on the inside, but not super fluffy. When i broke it apart it was not really crumbly.

Conclusion

My hypothesis was correct, the cookie with the combination of brown and white sugar was the best.



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**1204**      **Alex Bleackley**  
**Div/Cat**    **Physical and Math / Primary**  
**Title:**      **Student Speed**

**Summary:**    Question: Can technology excelerate work for students or will it negatively impact them.

For my experiment I am going to give two groups of people ten minutes to complete a word search that I have put together. I am going to have one group do the word search on a computer and the other a piece of paper with the word search on it. During the time that they are doing the wordsearch I am going to time them and if the paper is faster

I am going to research all the benefits and negatives of technology and how they can benefit students but harm them too. One of the good things is the good things about computers

My hypothesis is that the group with the computer is going to be faster because on the paper you may not be able to see it as clearly. Also on the computer you have many benefits such as it is very fast and all of our computers here are very fast.

Procedure:

Give grades 5-8 permission forms.

Whoever signs up gets sorted into 1 of 2 groups.

During recess I will take them in for my experiment.

I will give one team a electronic word search the other a paper word search.

I will time them.

The times will be put into my conclusion.

The fastest time will win a trophy.c



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## Prefair Report

**1205**      **Saki Braun**

**Div/Cat**    **Physical and Math / Primary**

**Title:**      **Slinky Wars**

**Summary:**    The purpose of my project, Slinky Wars, is to find out what type of slinky is the best. The best is the slinky that walks down steps the fastest. I will also test what type of slinky walks down the greatest number of steps. I will test four different slinkies: (1) a metal slinky which is 6 cm x 8.8 cm, (2) a metal slinky which is 5.8 cm x 6.7 cm, (3) a plastic slinky which is 15 cm x 15.5 cm, and (4) a plastic slinky which is 6.3 cm x 7.8 cm. My hypothesis is that the plastic 15 cm x 15.5 cm slinky will walk down the steps in the least amount of time and it will go down the most steps because it is the heaviest. My materials are four different sizes of slinkies, two metal and two plastic, standard eight centimeter high steps, a ruler and a stopwatch. My procedure is to place each slinky on the top step, release the slinky in a flicking motion, time how long the slinky walks until it stops and count how many times it flipped. This is repeated 20 times for each slinky and a chart is made for each slinky to determine the average time per step. I hope this project brings slinkies back in style!



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## Prefair Report

**1206**      **Zoe Nicholson**

**Div/Cat**    **Physical and Math / Primary**

**Title:**      **Bouncing high: The power of polymers**

**Summary:** "My experiment is on bouncy balls, and which type of glue works best for home made ones. Mixing cornstarch, borax and glue causes a chemical reaction that creates polymers. These polymers have elastic energy.

The purpose of my study was to find out which glue made the ball that bounced the highest. The glues I used were Weldbond universal adhesive, Elmer's color glue, Elmer's washable, school glue, and Crayola washable glue.

My hypothesis was that the Elmer's color glue will have the best bounce because the color glue was designed to make slime. Bouncy balls are slime with cornstarch added. The color glue may have the most monomers, which in turn will make the most elastic polymer ball.

Procedure: I made two balls from each glue. I bounced each ball 5 times and filmed it in slo-mo on a iPhone and measured how high each ball went. I averaged the results for each ball and compared them. I also calculated each ball's potential energy based on its mass and the drop height.

Results: the best bouncy ball was made from Elmer's Blue Glue. The worst was Weldbond/Yellow. The most consistent bouncy ball was the Crayola/Red ball. The smallest range in bounce variability was found in both the Crayola/Red 1 and Weldbond/Yellow 2 balls. The ball with the widest range of bounce variability was Weldbond/Yellow 1. Generally, the heavier versions of the balls bounced higher, with the exception of the Weldbond/Yellow.

Conclusion

1. Chemistry: The three school glues made the best bouncy balls. They may contain more monomer (vinyl acetate) in the same volume than Weldbond. I could not find the exact concentrations for any of these glues. Weldbond may contain other additives and less monomers. The Weldbond balls were also the heaviest, suggesting that other ingredients might be present. Easy ball-making correlated with balls that bounced better: Elmer's Colour and Crayola balls were the easiest. The Elmer's School glue was very sticky and took a long time to dry, and the Weldbond kept breaking in half.

2. Physics: Ball weight & diameter did not correlate with bounce height: The best ball (Elmer's Colour) was the second highest in weight and diameter, and the worst ball (Weldbond) was the highest in weight and diameter. In each pair though, the heavier of the two balls always performed better.

All the balls had a very similar potential energy ( $PE=mgh$ ) since they were dropped from the same height, and the variations in their masses were very small. Elmer's Colour had the best percentage-return-to-bounce height, which is a measure of its elastic energy (in turn a measure of its polymerisation).



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**1207**      **Nathan Bechard**

**Div/Cat**    **Physical and Math / Primary**

**Title:**      **Does the size and type of a rechargeable battery affect the rate the it will charge at?**

**Summary:** "My pre-fair report is a report about every thing about my project, My batteries that i will be using are Energizer AA- NiMH nickel-metal hydride, Energizer AAA NiMH Rechargeable nickel-cadmium and Panasonic NIMH 1.2V 750MAH AAA battery. And this batteries are all NIMH and that stands for Nickel-Metal Hydride. And my project is i will be testing if a bigger battery affects the way it will charge at, and pretty much i want to see if a big battery charges faster than a smaller battery. My materials are a AA nickel-metal hydride (NiMH) Battery AAA nickel-cadmium (NiCd) Battery, AAA nickel-metal hydride (NiMH) Battery, Electrical outlet Amp meter/multimeter. And all of the things that i just told you for my project. And the price of my project is \$53.30 plus all the materials that i have said earlier.

Details:

For my hypothesis i will be testing batteries and the batteries i'll be testing are duracell, energizer, lithium and lead acid batteries. Or Energizer AA- NiMH nickel-metal hydride, Energizer AAA NiMH Rechargeable nickel-cadmium, Panasonic NIMH 1.2V 750MAH AAA battery. And if i was to plus everything up it would be \$53.30 for the amount of money i am going to be using on Batteries for my project."



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**1208**      **Alexa Warren**

**Div/Cat**    **Physical and Math / Primary**

**Title:**      **Fruit and Veggie Power**

**Summary:** This science fair project involves creating batteries out of common fruits and vegetables. I hoped to learn how and why simple materials can create electricity, and why the chemical components (e.g. acid level) of certain fruits and vegetables are likely to create different voltages. The purpose of this project was to determine which fruit or vegetable will create the most voltage. My hypothesis was that the lemon would create the highest electron flow (measured voltage) because it has the highest acid level. Batteries were made using a potato, lemon and apple. The fruit/vegetable batteries were created using a copper and zinc nail inserted into the fruit/vegetable. Voltage was measured with a volt meter. Two trials were completed to ensure similarity of results. According to my experiments in the first test I found that the potato had a voltage of 0.854, the lemon was 0.929 and the apple had the highest voltage of 0.959. My results do not support my hypothesis as it turns out that the apple created the highest voltage. There were some factors that I did not control for (sources of error) in this experiment such as size differences of the fruit/vegetable, and freshness of the fruit/vegetable. These could affect the moisture level and other chemical (atomic) things in the fruit/vegetable specimens. These factors might explain the reason for differences in the voltage readings. Just the acid level of the fruit/vegetable does not seem to determine the resulting voltage. There must be other chemical (atomic) factors that are more complicated and goes beyond this experiment. However, the potato did have a lower acid content than the apple and lemon, and as I predicted, it did produce lower voltage levels.





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