# Monarch Science Fair Projects


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Participation is ***optional*** for 3rd graders and ***mandatory*** for **4th** and **5th** graders.

Projects are due on **January 29, 2014.**

Judges will not place late entries.

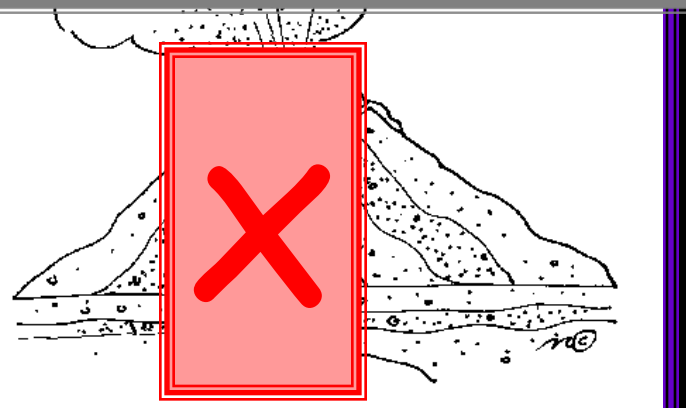
# Science Fair Projects MUST be EXPERIMENTS

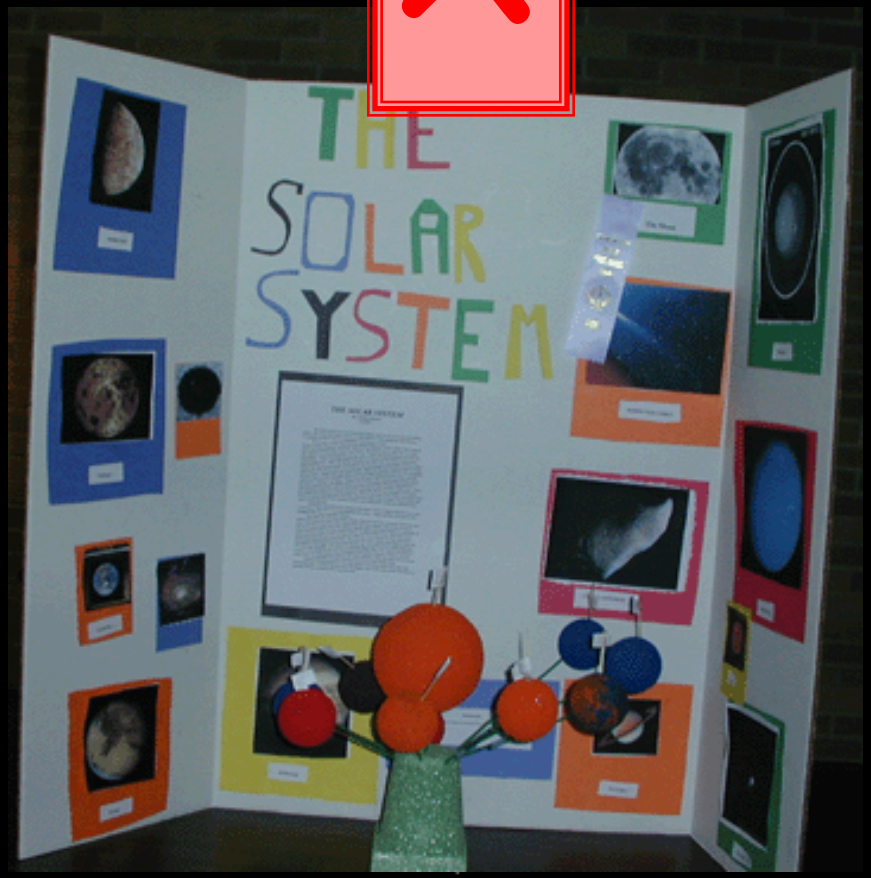
An experiment is a test to find out something. Experiments are repeated 3 times. I can label this as Trial 1, Trial 2, and Trial 3.

Judges **will not place** projects for the district level that do not follow the Scientific Method.

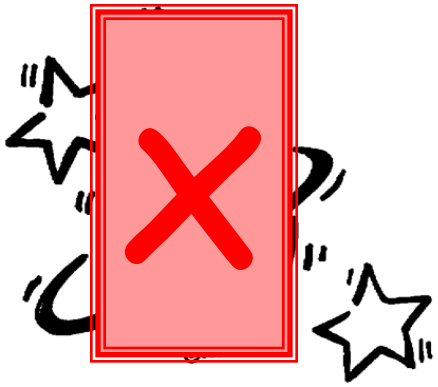
# DO NOT MAKE A VOLCANO.

**DO NOT MAKE A VOLCANO.**
**THIS IS A DEMONSTRATION.**



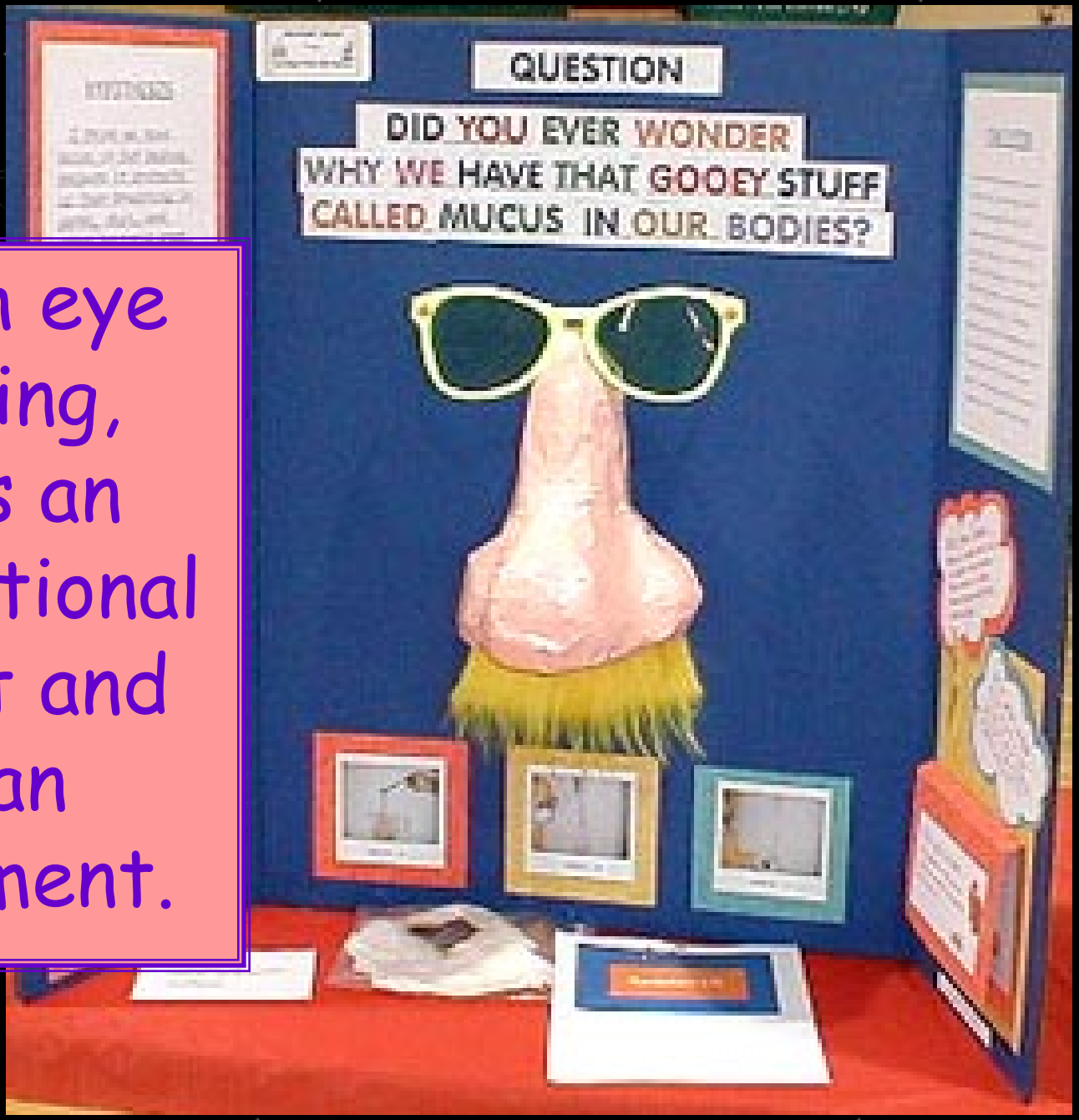


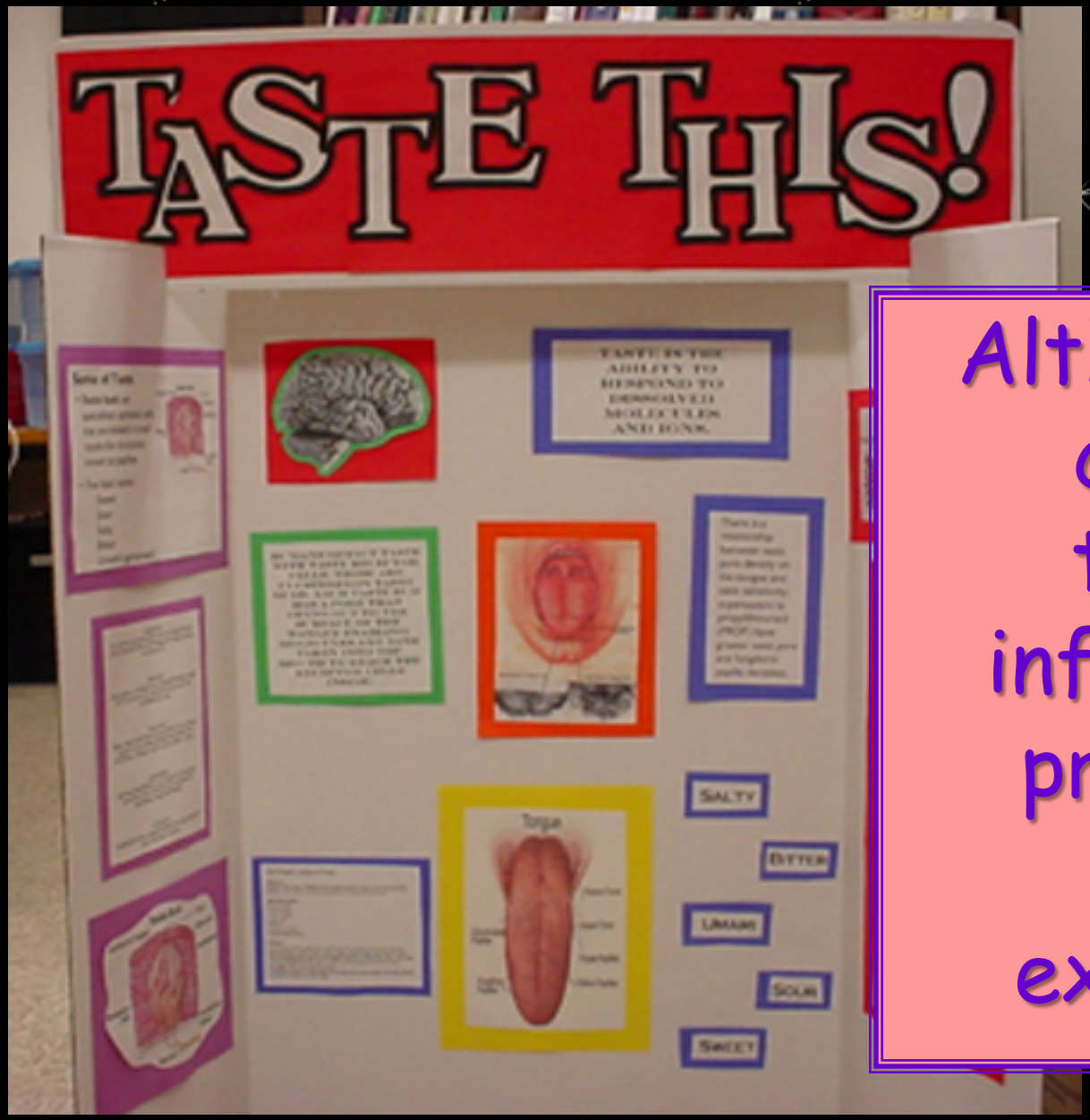

# DO NOT USE THE SOLAR SYSTEM.



**DO NOT MAKE A MODEL OF THE SOLAR SYSTEM.**

Although eye catching, this is an informational project and not an experiment.






Although eye catching, this is an informational project and not an experiment.

# Select a Topic

## MAKE SURE IT IS A TOPIC YOU CAN INVESTIGATE.


Select a topic that genuinely interests you.

Where can I find ideas for Science Fair Projects?

# Watch commercials on television. Test their claims.

Does that deodorant really stop wetness better than another one ?

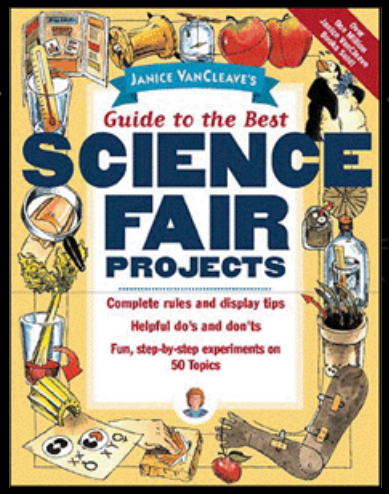
**PRODUCTS THAT CLAIM TO BE THE BEST CAN BE COMPARED WITH OTHER PRODUCTS THAT CLAIM TO BE THE BEST.**

# Think about current events. Look in the newspaper.

# Use your experiences.

Remember a time you thought "I wonder what would happen if..." then turn that into a project.

Make sure you do an experiment. Sometimes demonstrations and models are included in Science Fair books.


Browse and look at book titles, then look inside the books that look interesting to you.

# Gather Background Information

Gather information about your topic from books, magazines, the Internet, people and companies.
Keep notes about where you found your information.

# What is the PURPOSE?

- Why is this a project worth doing?
- Why are the results important?
- Who would want to know the results?

# Use the Scientific Method

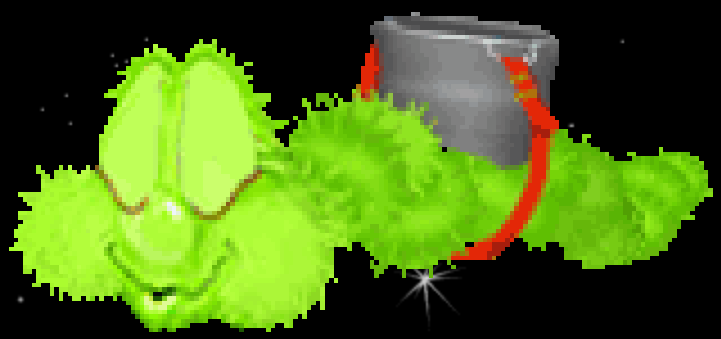
Question
Prediction
Materials
Procedure
Results
Conclusion

# Question or Problem

## What do I want to find out ?

The question or problem has to be something that I am able to measure.

# Prediction or Hypothesis



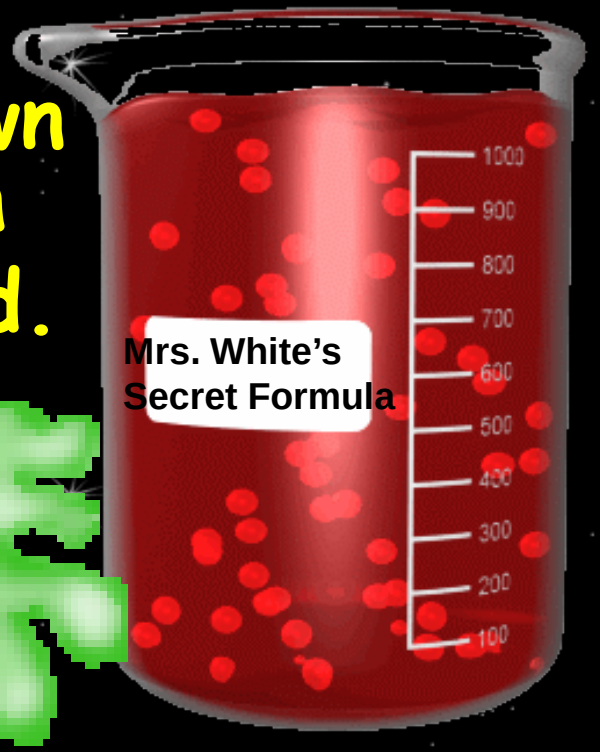
What do I think will happen?

If……, then I predict (or hypothesize) that…

# Materials

## What will I use?

Materials can be shown as a detailed list with exact quantities listed.



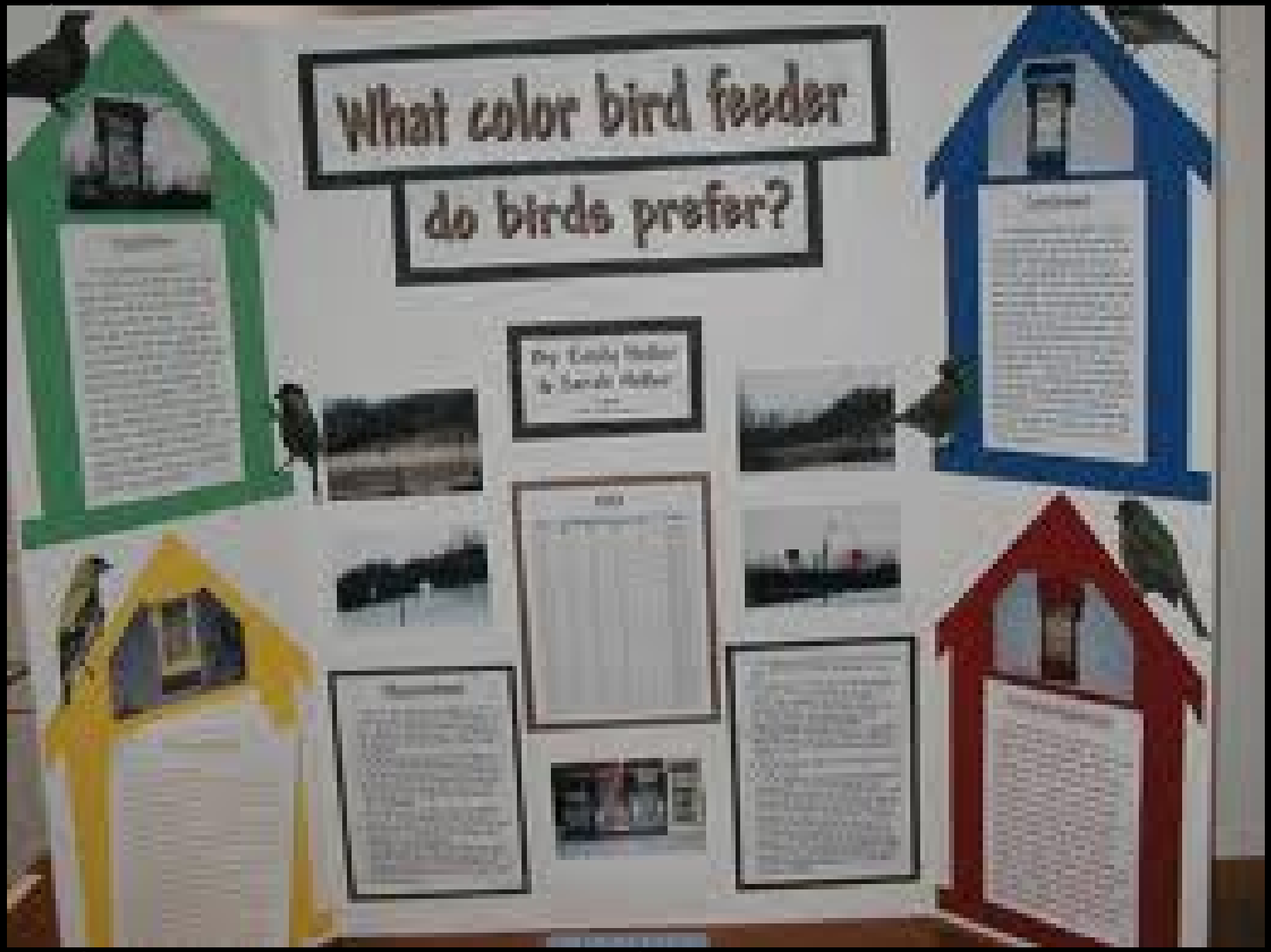
THESE ITEMS *MAY NOT* BE BROUGHT INTO THE SCIENCE FAIR!

- Chemicals
- Soil or Plants
- Any Drugs
- Food
- Bacteria
- Pathogens
- Blood or Body Fluid
- Needles
- Weapons
- Bullets
- Surgical Pictures
- Hazardous Machines
- Desktop Computers
- Animals
- Preserved Tissue

# Procedure

## What will I do ?

My procedure needs to be specific, concise like a step by step recipe. As I plan my experiment, I need to identify the three types of variables.


What color bird feeder
do birds prefer?

# Variables

I need to identify the variables in my experiment.

**Independent Variable – the one factor I change**

**Dependent Variable – the one factor that I measure**

**Controlled variables – all the factors that I keep the same**

# Variables

Variables are the things that have an effect on my experiment.

My **independent variable** is the one factor I change (or use in different amounts). All other factors are given the exact same conditions and are called my **controlled variables**. I need to explain things I did to make it a controlled experiment.

The **independent variable** is the one condition that you change in the experiment. It is the factor that you are comparing or testing. What may affect the results of my experiment? Choose one variable to change and keep the others the same or controlled.

The **controlled variables** are the conditions that need to remain the same during my experiment so that they do not affect the results.

The **dependent variable** is what I use to measure the independent variable.

My dependent variable is what I use to measure the independent variable.

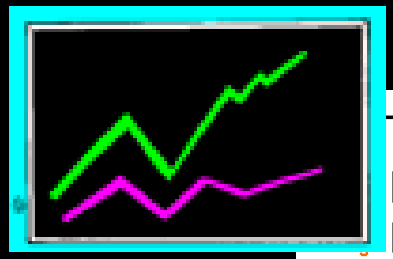
For example, if my question is, "Which brand of dog food do my dogs prefer?'

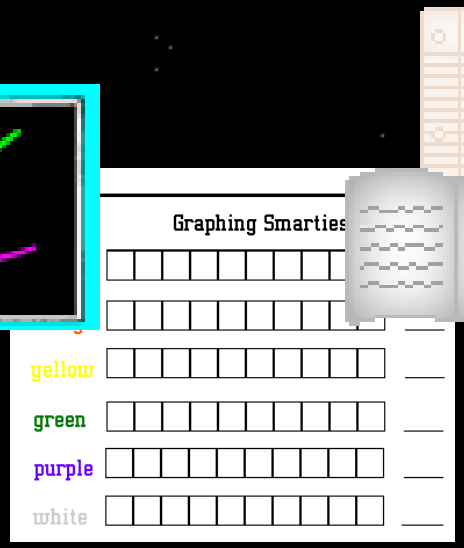
The brands of food used is the independent variable and the dependent variable is how much food of each brand is eaten during the 3 test trials.

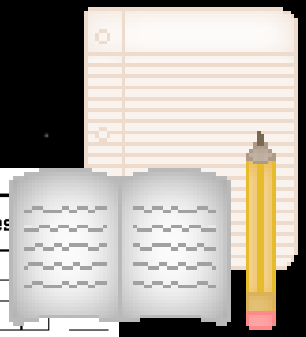
# Results

## What actually happened?

This is where I show my data collection using charts, graphs, journals, photographs or other visual aids.





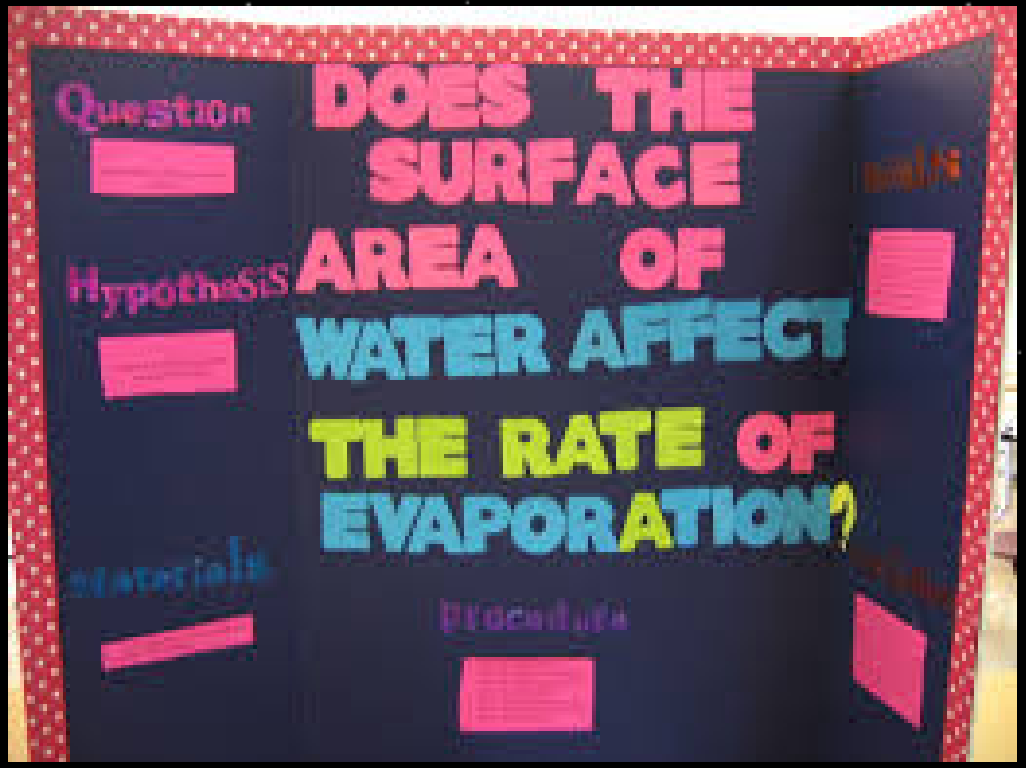



# Conclusion

## What did I learn?

### Based on my results I learned…

My conclusion is clearly supported by data, tells what I have learned and its application, and if my prediction or hypothesis was correct or incorrect. I have included a statement about what I might do differently if I did this project again and if I have any new questions to investigate.




Project deadlines are provided to prevent "I did this the night before."

# BE CREATIVE and Original!

What are some examples of great projects?


Burn, Baby Burn... Or NOT
Procedure
Purpose
Results
Steps:
1. Use file folders and clear plastic to make testing tools.
2. Glue a cutout on all clear folder sections.
3. In a semi-dark room, place 3 sheets of Nature Print Paper inside each folder.
4. Cover the Nature Print Paper with cardstock, close the folders, and clip each side to prevent sunlight exposure.
5. Using a sponge brush, apply 1 teaspoon of each sunscreen to folder sections.
6. Place the folders outside in direct sunlight, lotion side up, and remove the cardstock.
7. Expose the Nature Print Paper to direct sunlight for 2 minutes. Reinsert the cardstock inside the folder and clip each side.
8. In a semi-dark room, soak the Nature Print Paper in a container of tap water for 1 minute.
9. Remove paper from water and allow to dry flat in a dark place.
10. Compare the results and analyze the data.
The purpose of our experiment is to see which Sunscreen SPF is most effective. In Science class, our teacher, Mrs. Wright, told us the sun produces harmful sun rays. The results of our experiment would benefit anyone who enjoys working outside or going to the beach.
make a difference in sunscreen effectiveness?
Prediction
1 Predicted the sunscreen with SPF 15 would work the best.
2 Predicted the sunscreen with SPF 30 would work the best.
15 Predicted the sunscreen with SPF 50 would work the best.
5 Predicted all three sunscreens would work the same regardless of the SPF.
SunScreen Data
Based on the results of our class experiment, we learned that SPF 30 and SPF 50 offer more protection than SPF 15. There is not much difference in the amount of protection offered between SPF 30 and SPF 50.
Materials
clear tape
3 plastic sheets
black Sharpie marker
tap water
3 sheets of cardstock
3 plastic containers
3 sponge brushes
3 File folders
sunlight
paper towels
teaspoon
12 clips
9 people cutouts
Nature Print Paper (sun sensitive paper)
Banana Boat Ultra Defense Sunscreen SPF 15
Banana Boat Ultra Defense Sunscreen SPF 30
Banana Boat Ultra Defense Sunscreen SPF 50
dot stickers (pink, blue, and purple)
timer
glue
Variables
Our independent variable was the 3 different types of SPF sunscreen: Banana Boat SPF 15, Banana Boat SPF 30, and Banana Boat SPF 50. SPF means sun protection factor.
Our dependent variable was how much sunlight the different sunscreen SPF's blocked. We measure this by the degree of blue color on the Nature Print Paper.
Our controlled variables were that we exposed the Nature Print Paper with sunscreen to direct sunlight for the same amount of time, used the same testing tools, applied the same amount of sunscreen, and soaked the paper for the same amount of time.
Conclusion
In doing research for our experiment, we learned that it is very important to use sunscreen. When we did a cost comparison we learned that SPF 50 cost $1.00 more than SPF 30. We decided SPF 30 would be the best buy.
Wright
GR4-CLASS 24

# Breakfast & Brains

## Question

Does eating breakfast improve short-term memory?

## Prediction

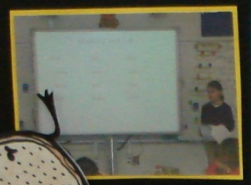
I predict eating breakfast will improve short-term memory.

## Purpose

The purpose of my experiment is to find out if eating breakfast will improve short-term memory. Many children do not eat breakfast, which is not healthy. If my results show eating breakfast improves short-term memory, children might decide to eat breakfast instead of skipping it. Then they will be healthier, concentrate better in school, remember more, and get better grades.

## Procedure

1. Arrive at testing area at 7:35 A.M.
2. Set up breakfast items.
3. Install flash drive in laptop to display memory test's blank screen (first slide).
4. Give Memory Test 1-A sheet to each child, and make sure each child has a sharpened pencil.
5. Give the students the test by reading and following the instructions in "Directions for Test" (#1-13).
6. Collect test papers from students.
7. Serve breakfast (100% juice box, ½ banana, breakfast sandwhich) to all participating students.
8. Return in one hour after serving breakfast and give Memory Test 1-B. Read "Directions for Test" (#6-13).
9. Collect test papers.
10. Return the next morning and follow the same directions for Test 2-A and 2-B.
11. Return the third day and follow the same directions for Test 3-A and 3-B.



## Materials

- Third grade class (Mrs. Nabhani's class)
- Parent permission form for each child
- Six different memory tests
- Test Directions
- Flash Drive
- Laptop
- Power Point remote
- Promethean Board
- Clock
- Timer
- Questionnaire/test sheet for each child during three different test days
- Pencil for each child
- Breakfast sandwich for each child during three different test days

Sandwich was made with:
- Whole grain English muffin
- One scrambled egg
- Slice of american cheese

- Juice box for each child during the three different test days
- Banana for each child during three different test days


## Variables

**Independent Variable**- The independent variable in my project was giving one memory test with breakfast and one without breakfast. I also made memory tests with different words to remember for each test given so the students would not get confused or get higher test score.

**Controlled Variables**- My controlled variables are that I'm using the same students (class), starting time for tests (7:45 am), directions, questions on questionnaires, how I displayed the words on the memory tests (Promethean Board), font and format of words on display & memory test sheets, amount of time to study words (60 seconds) and amount of time to write words they remembered (3 minutes), breakfast, and giving the second test of each day one hour after serving breakfast.

**Dependant Variables**: In the experiment, the participating students did not study the entire study time given. I don't think they did their best on the second test of Day One. The next day I told the students that this testing was important and that I needed accurate test results. During the next two days they seemed to be paying more attention and use all of their study time.

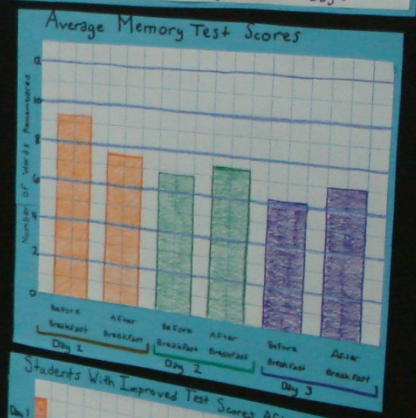
**Acknowledgments:** Thank you **Mrs. Wright** for teaching me vocabulary in the scientific method and supplying me with graph paper.
Thank you **Mrs. Nabhani and her third grade students** who participated in her class for sharing their time to help me.
Thank you to those **students' parents** who got them to school on time and gave their permission.
Thank you **Mom** for cooking for my Science Fair Project and **Dad** for paying for everything.
Thank you **Logan** for helping me grade some of the test papers.
**They all knew how important this was to me.**

## Results

Data Collection

| Student | Test Day 1 Before Breakfast | Test Day 1 After Breakfast | Difference | Test Day 2 Before Breakfast | Test Day 2 After Breakfast | Difference | Test Day 3 Before Breakfast | Test Day 3 After Breakfast | Difference |
|---|---|---|---|---|---|---|---|---|---|
| A | 10 | 10 | 0 | 9 | 8 | -1 | 8 | 6 | -2 |
| B | 8 | 6 | -2 | 7 | 5 | -2 | 5 | 7 | +2 |
| C | 10 | 7 | -3 | 8 | 8 | 0 | 4 | 4 | 0 |
| D | 6 | 5 | -1 | 5 | 6 | +1 | 3 | 3 | 0 |
| E | 9 | 9 | 0 | 8 | 11 | +3 | 7 | 11 | +4 |
| F | 12 | 10 | -2 | 7 | 9 | +2 | 7 | 11 | +4 |
| G | 11 | 10 | -1 | 8 | 9 | +1 | 7 | 9 | +2 |
| H | 10 | 8 | -2 | 7 | 10 | +3 | 8 | 7 | -1 |
| I | 10 | 9 | -1 | 6 | 9 | +3 | 6 | 6 | 0 |
| J | 8 | 8 | 0 | 8 | 5 | -3 | 5 | 6 | +1 |
| K | 11 | 10 | -1 | 9 | 5 | -4 | 6 | 7 | +1 |
| L | 7 | 9 | +2 | 4 | 6 | +2 | 6 | 8 | +2 |
| M | 9 | 5 | -4 | Absent | | | 8 | 7 | -1 |
| N | 11 | 10 | -1 | 11 | 9 | -2 | 9 | 11 | +2 |
| O | 9 | 3 | -6 | 6 | 7 | +1 | 8 | 8 | 0 |
| P | 10 | 6 | -4 | 3 | 8 | +5 | 4 | 9 | +5 |
| Q | 7 | 9 | +2 | 8 | 7 | -1 | 6 | 3 | -3 |

Day 1 Day 2 Day 3





## Conclusion

Based on the results of my experiment, I learned that eating breakfast can improve your memory. My prediction was correct. In science class, I learned breakfast gives you energy to start the day. If I could do this experiment again, I would like to try different breakfast items to see which ones improve memory the most. In this experiment I worked with third graders, and I would like to work with other grades to see if my data stays the same.

Strike

Question

Does the weight of a bowling ball have an affect on the number of bowling pins that can be knocked down to obtain the highest score?

Purpose

The purpose of this science experiment is to find the right size bowling ball that works best for my age and size. I have been bowling for three years. Each time I go bowling, I have just grabbed any ball, and my ball usually ended up in the gutter or I made low scores. The three size balls I am choosing to test is the size six ball, the size eight ball, and the size ten ball. If you are going bowling you could use my bowling results to help you choose the ball that's right for you.

Prediction

I predict that I will bowl a higher scoring game using the size 10 bowling ball than with the size 6 ball and the size 8 ball.

Procedure

1. Gather three different weight balls.
2. Need one bowling lane.
3. Enter each bowling ball's weight numbers into the bowling lane's computer.
4. Play one round with first ball.
5. Play one round with the second ball.
6. Play one round with the third ball.
7. Repeat steps 4-6 nine more times.

Variables

The **independent** variable was three bowling balls that weighed different amounts: six, eight, and ten pounds.

The **dependent** variable was the size ball I made the highest score with.

The **controlled** variable was that each ball has the same diameter (9.4

# MAP vs. BAR GRAPH

## Question

Is it easier to interpret information using a map or a bar graph?

## Prediction

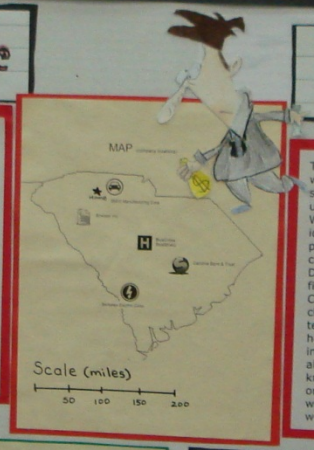
10 Predicted the map would be the easier way for students to interpret information.

10 Predicted the bar graph would be the easier way for students to interpret information.

7 Predicted there would not be a difference in scores regardless of whether a map or a bar graph was used.

## Procedure

1. We created a skill sheet about careers in South Carolina.
2. One group of volunteers completed the skill sheet using the map to help answer the questions.
3. Another group of volunteers completed the skill sheet using a bar graph to help answer the questions.
4. Each group was given 3 minutes to complete the skill sheet.
5. We scored the sheets from each group.
6. We analyzed the data.

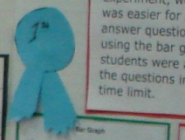


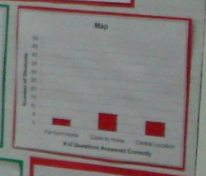

## Purpose

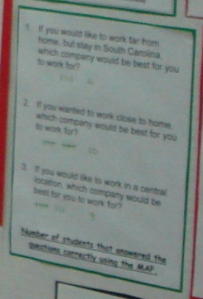
The purpose of our experiment was to compare how accurately students interpreted information using a map versus a bar graph. We became interested in this idea because of a Social Studies project. We were studying careers and our teacher, Mrs. Dacus, asked us to find the top five employers in South Carolina. The results of our class experiment could help teachers know the best way to help students visually interpret information. Our results could also help textbook companies know whether to use more maps or more bar graphs. People who work with map and bar graphs would want to know our results.

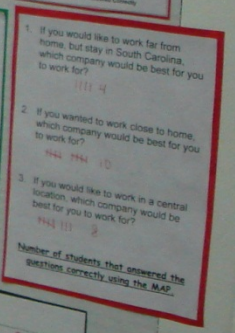
## Results

Based on the results of our experiment, we learned that it was easier for students to answer questions correctly using the bar graph. All students were able to answer the questions in the 3 minute time limit.



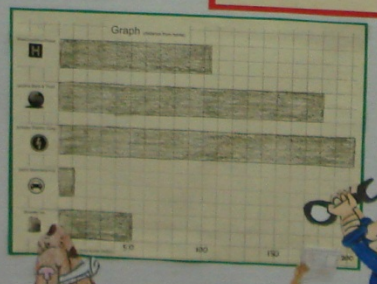




## Materials

- Map Sheet
- Bar Graph Sheet
- Timer
- Two Fourth Grade Classes
- Skills Sheet with 3 Questions




## Variables

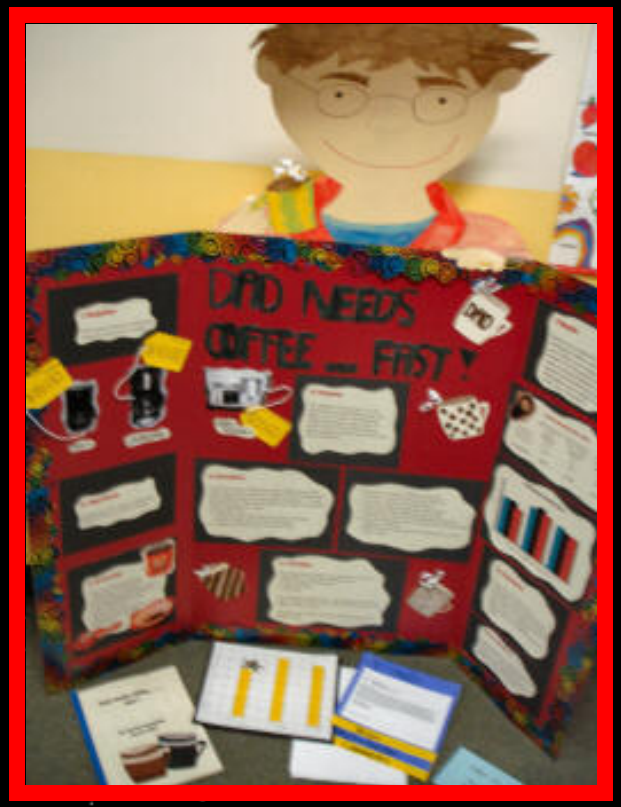
The independent variable is whether the student used a map or bar graph.

The dependent variable was how many questions the student answered correctly on the skill check.

The controlled variables were that all fourth graders were given the same three questions, the same instructions and the same amount of time to complete the skill check.

## Conclusion

We learned that students seemed to understand information better when presented on a bar graph than when presented on a map. This showed our teachers that we need more practice with interpreting information from maps, and that bar graphs are a good way to illustrate information.


DAD NEEDS
COFFEE - FIRST!

# Project Display Information

$2.00

Display Board

# Project Display Board

## Title of Project

**Question/Problem**
What I wanted to find out

**Prediction/ Hypothesis**
What I thought would happen

**Materials**
A list of the items I used to do this experiment

**Purpose**
Why I wanted to do this experiment and how the results might be important

**Variables**
This is an explanation of the one factor I changed and how I kept all the other factors the same.

**Procedure**
This is a numbered list of the steps I used to complete this experiment.

**Results**
What actually happened and where my data is shown

**Conclusion**
What I learned from this experiment and what I might do differently in the future

Acknowledgement – A thank you to the people who helped me with this project