So you have to make a Science Fair Project……..

How to get an A+ in Science in 7 easy steps!

Step 1: Select a Topic

Experiment Ideas

- Which type of lawn sprinkler works best?
- Which type/size of light bulb produces the most light?
- Which homemade airplane design flies best?
- Determine the accuracy of various thermometers
- Which battery lasts the longest? - How can power be increased?
- Insulation - best materials, thickness
- How is paint affected by temperature changes? When should you paint?

More Experiment Ideas

- Effects of temperature on viscosity of oil, chemical reactions
- What kind of soil is best for water retention?
- Is soil necessary for plant growth?
- What will cause nails to rust the most, vinegar, soda or water?
- Will an ice cube will melt faster in cold tap water or room temperature water.
- What color should your shingles be to attract the most light? Navy blue, brown or black?

Experimental Testing Ideas

- Testing of consumer products - glues, stain removers, antiseptics, mouthwash, detergents, paper towels,
- Removal of pollutants
- On which foods does fungus grow best?
- How are teeth affected by fluorides and acids?
- Comparing absorption rates of different materials to determine the best swimsuit.
- Lemon juice will clean pennies better than bleach, pop or detergent
- Will hot or cold water freeze faster?

Even More Experiment Ideas!

- Does music affect plant growth?
- What is in our drinking water?
- Tums, handy or just candy?
- Which type of flooring hold the most dirt?
- Is it better to run or walk in the rain to prevent you from getting wet?
- Affects of road salt to plant life.
- Will plants watered with pop grow faster than plants grown with water?
- Will plants grown in a clay, plastic or glass pot grow best?
- Can aspirin help plant growth?

ANYMORE IDEAS?

- Are homemade cleansers as effective as commercial cleansers?
- How does light affect plant growth?
- How does vinegar compare to other cleansers?
- Affects of detergents on pond life
- Radish seed growth under changing forces (gravity)
- Paper towel absorption by:
- Level 1) brand
- Level 2) shape and area
- Level 3) under stress
- Level 4) different chemical conditions

SAFETY AT ALL TIMES

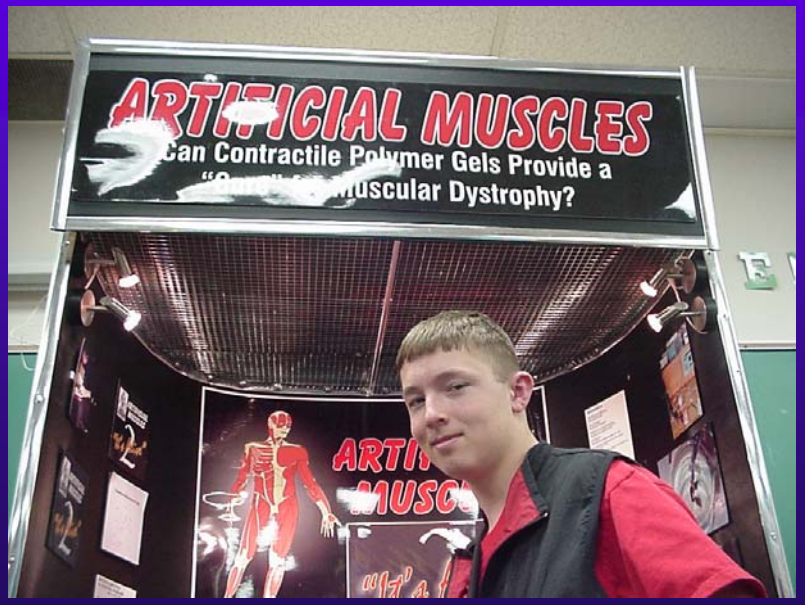
- Safety Rules:
- 1. You cannot work with any toxic or corrosive chemicals. All materials must be safely handled. Materials should not be poisonous or dangerous if accidentally digested. They should not cause harm when exposed to any part of the body.
- 2. You cannot work with any creature in the animal kingdom that may place them in danger or cause immediate or long term harm.

MORE SAFETY

- 3. Any work with electricity should not exceed six volts. If you are using normal plugs (lamps for work with tropism or hydroponics), you must have your parents approve of the area and the design. Proper outlets/ safety bars are required.
- 4. When building a working model, all safety precautions should be in effect. Safety glasses, gloves, hand guards and so on. Parental assistance or supervision is mandatory when using complex machines such as power tools.

Biotechnology

- Crop Development (Growing)
- Animal Science in Agriculture (Farms)
- Microbial (bacteria, fungus)



Physical & Mathematical Sciences

- Physics (simple machines)
- Chemistry (Baking soda, vinegar)
- Mathematics (use an equation)

Life Sciences/ Earth and Environmental Sciences

- Zoology (animals)
- Botany (plants)
- Genetics (DNA)
- Ecology (environment)
- Physiology (human mechanics)

Engineering / Computer Science

- Language Development (DOS)
- Operating Systems (Windows)
- Software (Computer Game)
- Bridges / Construction / Insulation
- Interfaces

Health Sciences

- Bacteria
- Asthma / Lung Capacity
- Cancer
- Smoking
- Viruses (SARS, FLU)
- Teeth Decay
- Use of Garlic in Health
- Effects of Coffee
- Positives of Exercise

Project Types

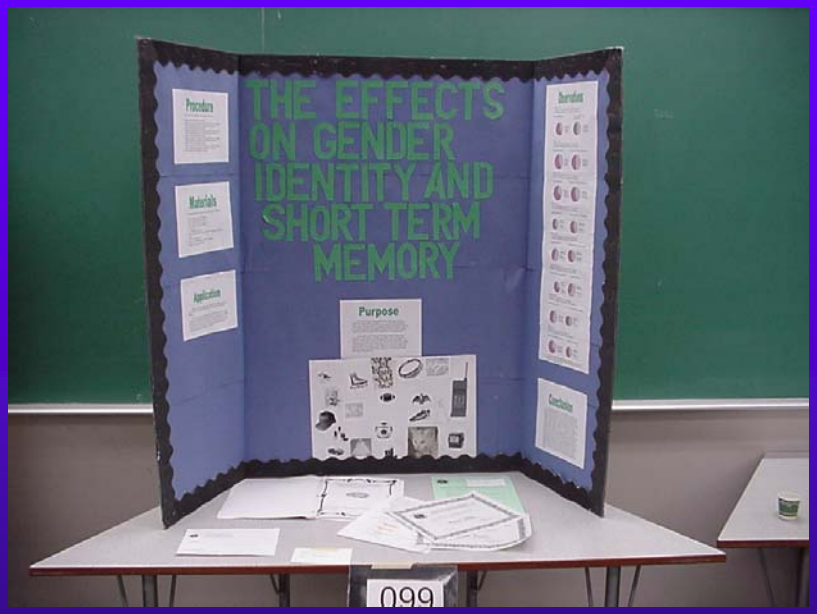
- ✓Experiment
- ✓Innovation (Patent)

Let's Explore Experiment Projects

Most science fair projects will be experiments, which use the scientific method:

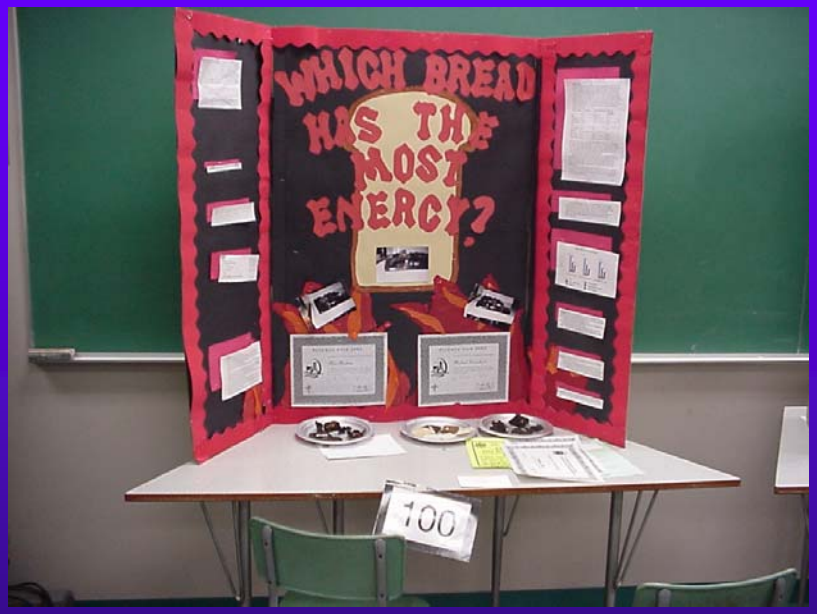
Purpose? Hypothesis? Method? Materials? Observations? Conclusions?

Experiment Project Examples



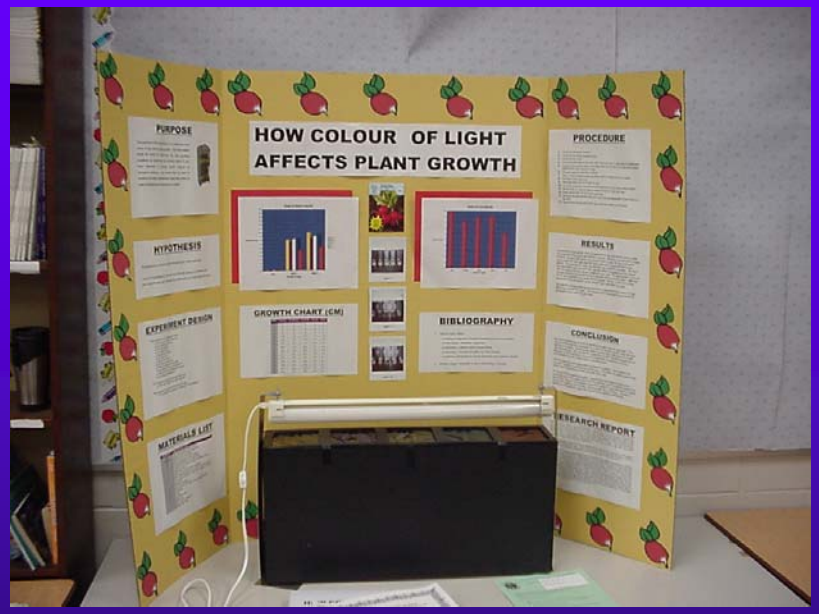
To determine if males or females have better short term memory.

Experiment Project Examples



To determine which bread has the most energy.

Experiment Project Examples



To determine how the colour of light affects plant growth.

Experiment Project Examples

Can you drink Little River water after filtration?

Experiment Project Examples

To determine which chip contains the least joules

Experiment Project Examples

To determine the best fluid used in hydraulics

Experiment Project Examples

To determine the best conditions to grow crystals

Experiment Project Examples

To determine the best ingredients to create soap

Experiment Project Examples

Which floor holds the most dirt?

Let's Explore Innovation Projects

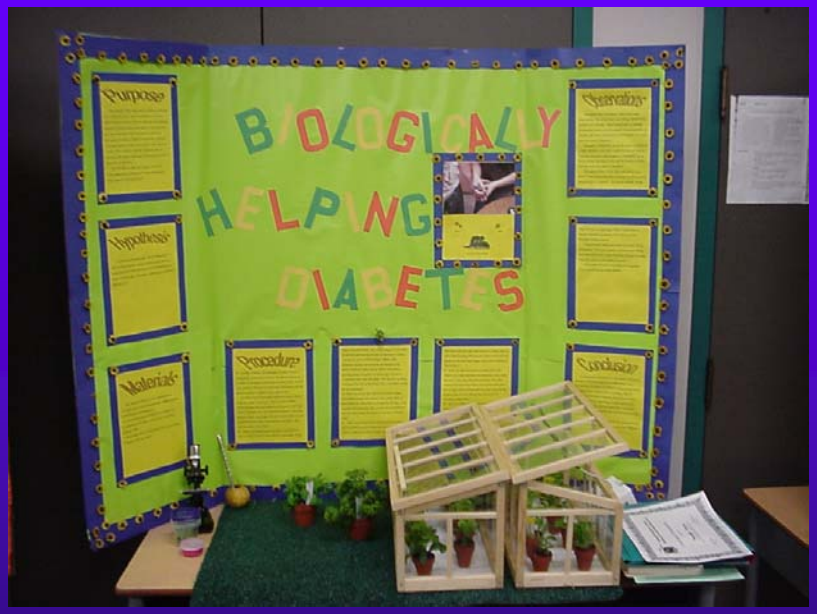
An original :

- Invention (could apply for patent)
- Design (i.e. original bridge concept)
- Computer simulation (program)

Innovation Projects

- You must still test your innovation in an experimental format!
- Example: If you design a new bridge, you must prove that your design is a quality design that can withstand large weight added (changing variable) as compared to another type of bridge design (control).

Innovation Project Examples



Growing a plant to biologically help diabetes

Innovation Project Examples

Creating the best slingshot

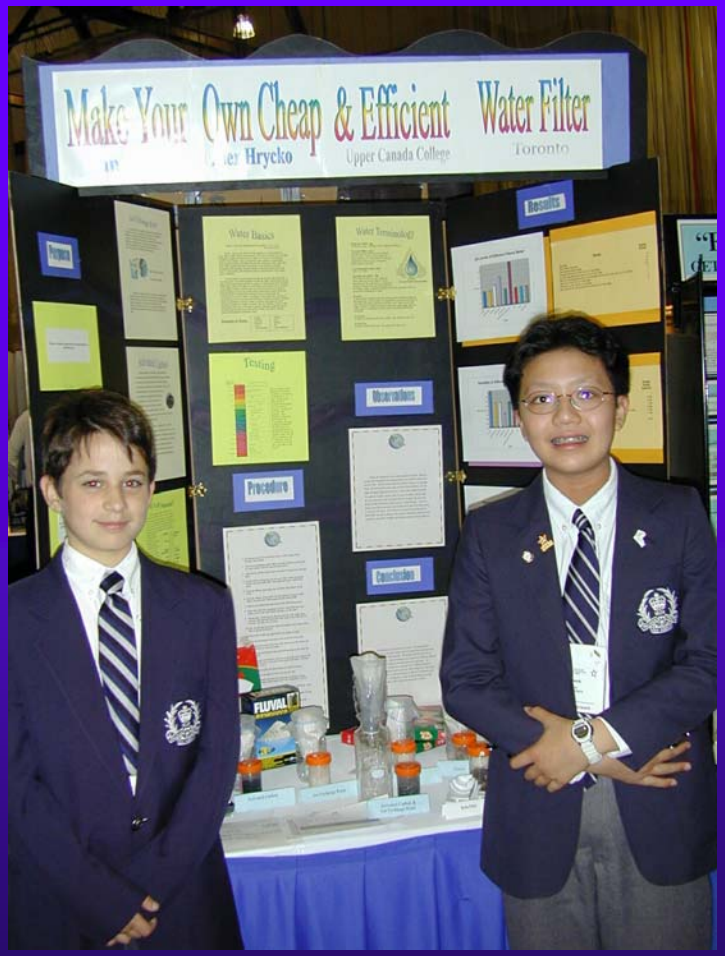
Innovation Project Examples

Making the ideal bale handler

Innovation Project Examples

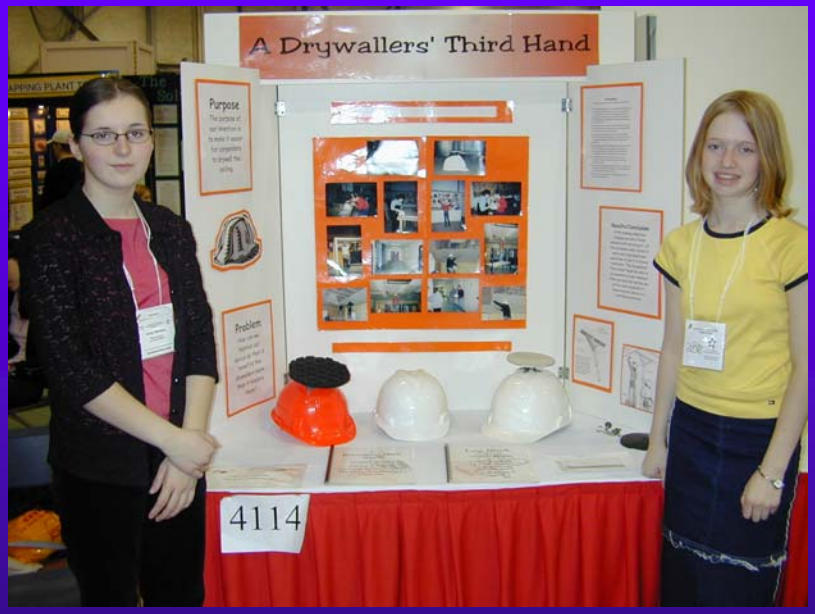
Building walls with newspaper

Innovation Project Examples



Making your own cheap & efficient water filter

Innovation Project Examples



Creating a new tool for drywallers

Innovation Project Examples

Making a new style of ballet shoe

Step 2: Research

Start the research process!

- Internet
- Contact experts (high school, college, university, family)
- Library
- Companies

Step 3: Purpose & Hypothesis

The Purpose is a description of what you will do.

i.e. to compare, to determine

The Hypothesis is an educational explanation as to what you think will happen.

While Conducting the Experiment ……..

- You must collect data (evidence).
- Do you know the difference between quantitative and qualitative data?

Qualitative- "The bridge looks like it will hold a lot of weight"

Quantitative – "The bridge can hold a maximum of 250 g of weight"

Step 4: The Experiment

Plan and organize an experiment.

Perform the experiment under controlled conditions.

Keep careful records, notes and pictures.

A Controlled Experiment

To conduct a scientific investigation, care must be taken to follow experimental procedures.

Variable – something that can be changed in the experiment

Control – not influenced by the variable

Here is an example

Purpose – How the amount of fertilizer used will affect plant growth.

Hypothesis – Increased dosages of fertilizer will cause greater growth in tomato plants.

Variable – Amount of fertilizer used

What other variables and conditions have to stay the same?

Answers……..

- 1. The seeds must all come from the same package and be randomly selected.
- 2. All seeds must be planted in the same size and type of pot with the same type of soil.
- 3. All plants must receive exactly the same amount of water and light.
- 4. The temperature for all test plants should be the same.
- 5. More than one plant should be used for each test group.

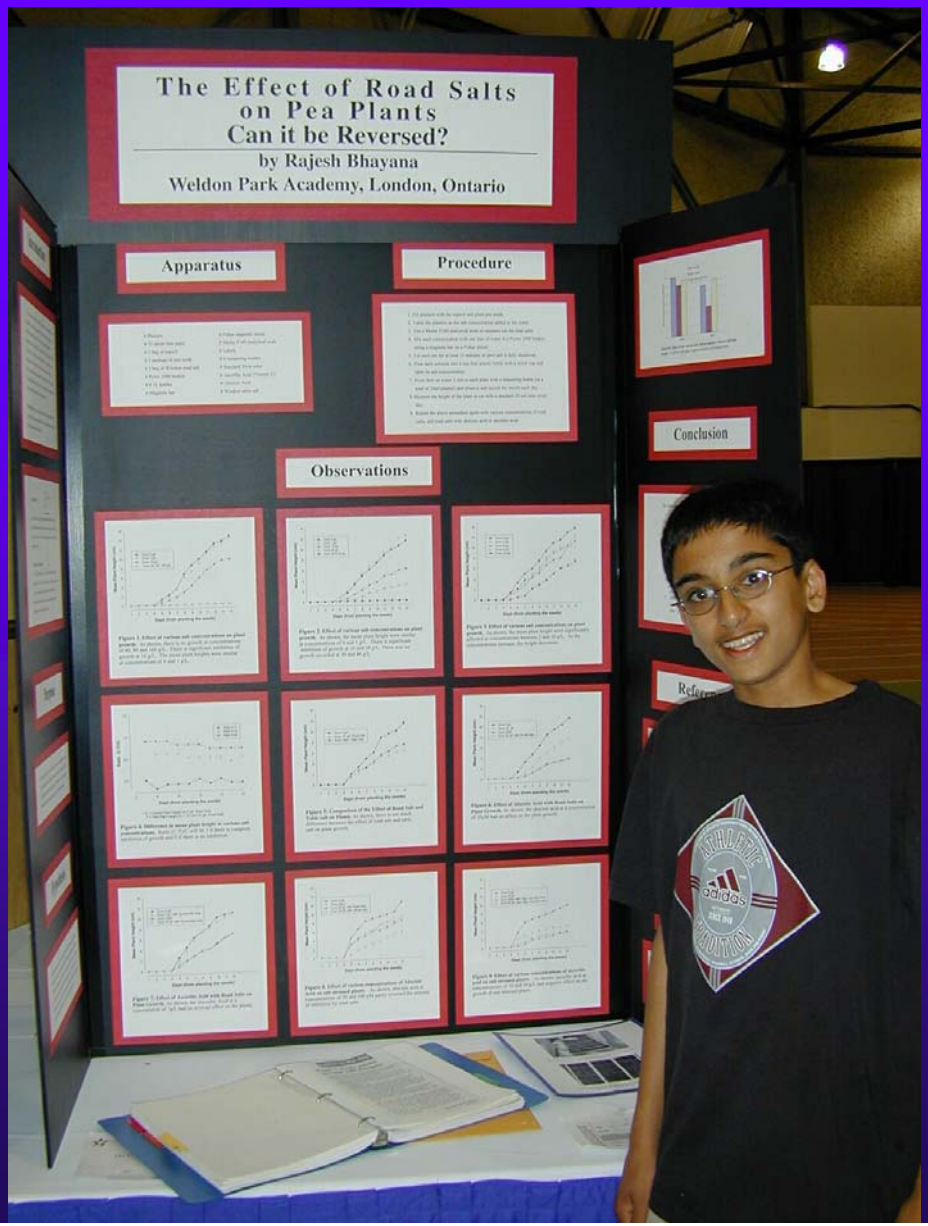
Answers Continued……..

- 6. Set one group as the CONTROL GROUP. This group is not given any fertilizer. (0 grams)
- 7. Set up two other test groups. One receives a certain amount of fertilizer each week. The other receives exactly twice as much.
- A) control 0 g B) 10 g C) 20 g

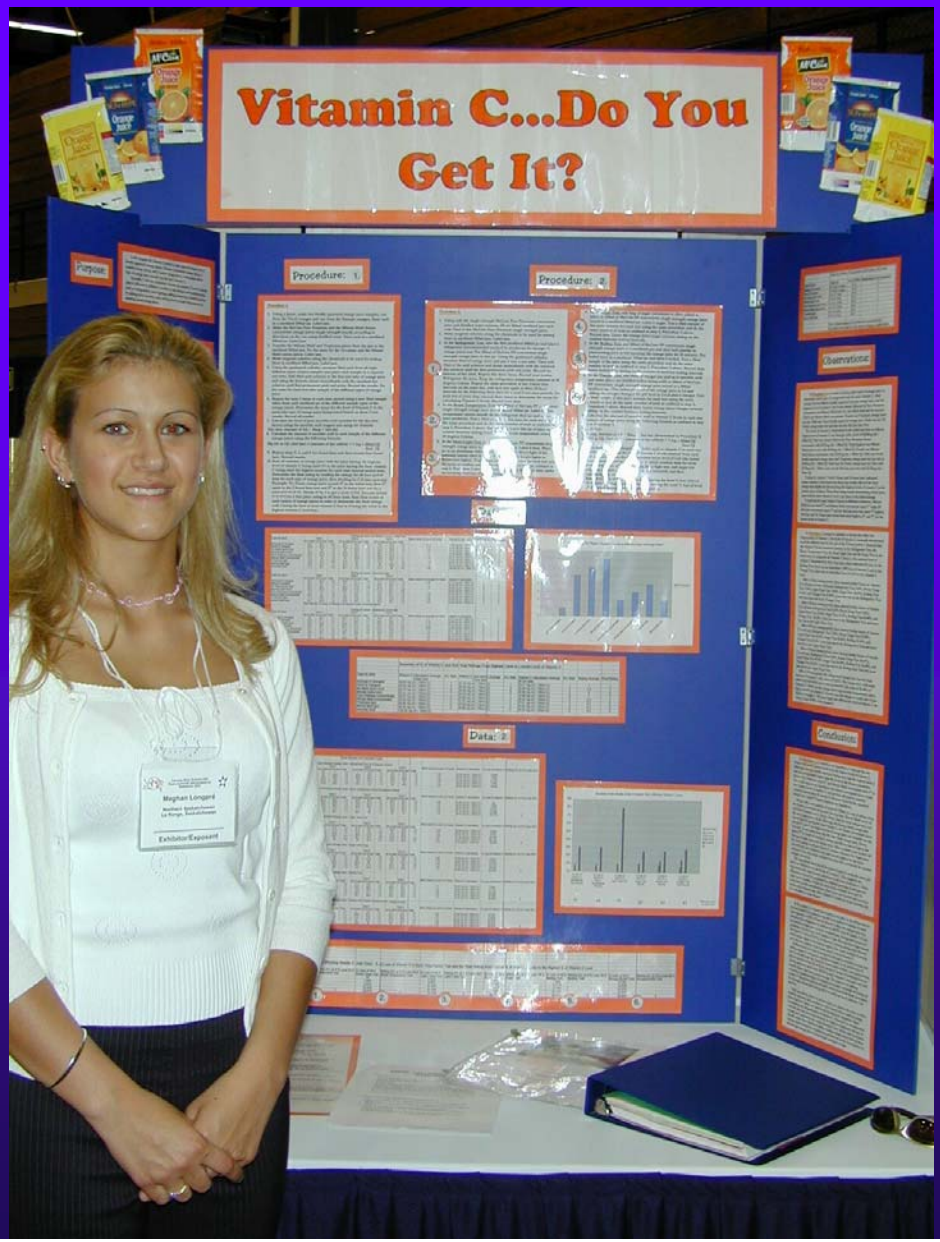
Step 5: Prepare the Scientific Report

- Purpose
- Hypothesis
- Materials
- Method
- Observations
- Graphs
- Charts
- Photos
- Conclusion
- Research

Step 6: Exhibit



Step 6: Exhibit



Step 6: Exhibit

This is the visual presentation of your project.

Use :

- Graphs
- Charts
- Clear bold lettering
- Binder with scientific report
- Visuals

Step 7: Judging

- Look neat
- Speak with enthusiasm
- State the purpose of your investigation
- Identify the conclusion
- Discuss any future plans you have to continue research on your topic

Windsor Regional Fair Awards

- Mad Science presentation to top participating school
- $500 to top performing school
- Books & prizes for top project in each grade level.
- 15 local awards(cash, plaques, medals) for projects in certain categories (engineering, environmental, etc)
- Bronze, Silver & Gold medals to all who qualify
- 20 Cash Prizes for Outstanding Enthusiasm to Science
- The chance to go to the Canada Wide Fair for 1 week if you are one of the top 8 students!(Gr. 7-12)

www.wrstef.ca

Windsor Regional Science, Technolgy and Engineering Fair Website

- For Award listings
- Space Registration. (Max of 30 students per school)
- Student Registration (once top projects have been determined)
- To enroll as a judge (must be 18 yrs or older) Teachers welcome to judge!