Bluewater Regional Science and Technology Fair

Guide

How Far Can I Go With This Project?

Every Science Project starts with a **good idea!**

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As you build on this idea and create your **project**, you gain new and strengthened skills, knowledge and self-satisfaction.

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The **School Science Fair** is the next level. Here you gain recognition by family and friends. Ribbons and certificates are distributed to students for their hard work. This is also the gateway to the Regional Science Fair.

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The **Regional Science Fair** is a great opportunity to meet new friends, get career ideas, receive scholarships, get summer job opportunities, new project ideas and to be eligible for national awards. Success at this level could mean a trip to the Canada Wide Science Fair which is held in cities all over the country!

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The **Canada Wide Science Fair** is for students in grades 7-OAC. At this level, you can go on international trips, get job opportunities, receive scholarships or cash rewards and find career possibilities.

Why Do A Project?

A Science Fair is an opportunity for students to demonstrate their scientific work to other students, parents and their community. It allows the student to learn how well he or she has done.

By working on an independent, integrated science project, a

student has an opportunity to learn and practice language, math, art, research as well as science skills.
It becomes an opportunity to experience some of the same challenges as those of a scientific researcher and at the same time provides a chance to discuss their work with friendly, knowledgeable judges.
Researching the scientific background, investigating relationships, or developing technology, recording information accurately and carefully and analyzing the data are just some of the skills and processes explored.
Building an interesting, eye-catching display, writing a thorough research report, identifying patterns, graphing the data precisely and presenting effectively are other related skills inherent in a project.

Three Different Processes Or Ways To Approach Your Project

Investigation: In this approach you would INVESTIGATE variables under controlled conditions to determine relationships and patterns of behaviors. In other words, design an experiment to address a problem for your particular topic.
Study: You may choose to perform a STUDY on your topic. This means that you will use previously existing data or information for the basis of your study. This means you may be looking towards the library or some other outside source for your information.
Technology: If you choose this route, you will create an innovative TECHNOLOGY which attempts to solve a problem. This will mean building some sort of model or working device to demonstrate your topic.

Choosing A Topic

This is often the hardest part of the whole project,especially as you try to come up with something that others have not already

done many times over. Here are some tips to help you along:

1. Start with the things you are interested in. Make up a list.
2. Then decide what you are really curious about with some general question you have about these topics.

For example: You are curious about weather. You ask the questions...

Why and how does weather change?
When and why do tornadoes happen?
Does weather affect human's health?
Does air pollution affect the weather?

3. Remember that a good science project is based on good questions that cannot always be answered.
4. Now you are getting closer to narrowing down your topic. Pick the specific aspect of the topic that interests you and develop your project around that. Avoid being too general. Don't forget the best idea is your own idea. There are other great ideas in all of these areas.

plants
health
food
environment
computers
chemistry
space microbiology
machines
animals
mathematics
medicine
inventions

... the list is limited only by your IMAGINATION...

5. Once you have arrived at your choice of topic the next step is to choose the approach you wish to use, **investigation, study or technology.** These approaches are outlined in the previous page in greater detail.

What To Expect From Judges

Judges will be looking for:

Originality - in the idea and the approach you have taken...
Accuracy - in the collection of information and your use of the process chosen...

Completeness - in doing your experiment, study or construction and understanding what has happened.
Results - ending up with knowledge that is relevant to the work and important to the researcher.

The Judges job is to:

-talk to you about what you have done
-listen to you
-read what you have written
-see what you have made or built
-ask questions
-perhaps make suggestions

And finally, the judges will evaluate your work against the levels of performance listed on the judging sheet.

ULTIMATELY, The judges want to learn what you have learned, and enjoy the work you have done.

Take Ownership Of Your Project

Know your project:

-what prompted you
-what you did
-what you found
-what went right and why
-what went wrong and why
-what are the applications of your project

Know the background materials:

-the scientific principals involved
-the research that has already been done

Know what you would have done differently:

-what could be done to improve your work
-what might be next

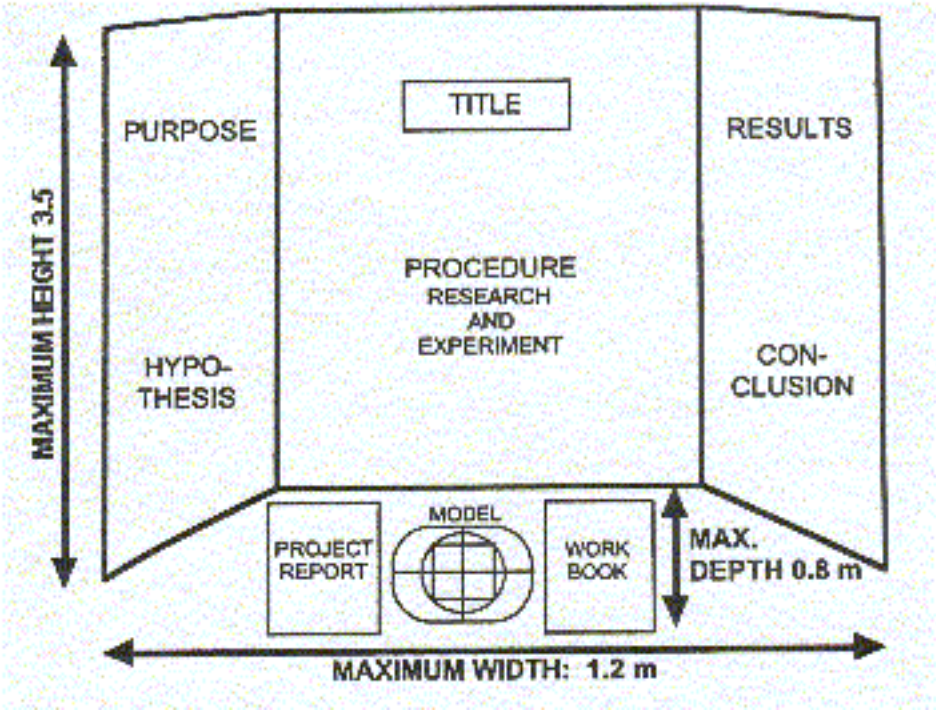
Questions to expect from Judges:

-Tell me about your project.
-What did you find or prove?
-How did you discover what you have found?
-What happened along the way?
-What worked?
-What did not work?
-What would you change next time?
-Explain a real life application for your work.

Introduce yourself
Say "Thank You" when it's over
Be Honest
Be friendly
Say "I don't know" if you don't...

Build An Exhibit To Be Proud Of

Building the display provides the chance to develop and demonstrate construction, artistic and written skills. There is a good deal of work involved in designing an exhibit that explains to the observer what the project is all about.
For the best use of space, a three panel backboard is recommended with the dimensions shown below. The materials should be strong but light weight for handling, easily broken down for shipping and the structure self-supporting.
Use of attractive lettering for the title and headings to make them stand out. Check spelling and type or print neatly.
Drawings, photographs, graphs, models and slides can all be used to illustrate the work done. Large items of equipment may not fit the space available and can be replaced with models, photographs and drawings.
Anything hazardous such as flammable liquids, dangerous chemicals, bare electric wires, open flames and uncovered drive belts cannot be displayed. Check the **SAFETY GUIDELINES FOR PROJECT DISPLAYS** page to be sure your display is considered safe.



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Preparing Projects Home

Advice To Parents

1. Please remember that the most important ingredients in any project are the amount of work that the student accomplishes, how much knowledge he or she acquires and how much initiative is displayed.
2. Realize your child will need help in understanding, acquiring and using the major science process skills; researching, organizing, measuring, calculating, reporting, demonstrating, experimenting, collecting, constructing and presenting. Your child may not have been taught these skills. Therefore, it may not be fair to expect him or her to know how to do them.
3. Give encouragement, support, and guidance to your child.
4. Make sure your child feels it is his or her project. Make sure the project is primarily the work of the child.
5. Realize that the teacher works with 20-30 students and this may make it difficult to give a large amount of individual attention

to your child.
6. Help your child plan a mutually agreed upon schedule to prevent a last minute project and disrupted household. A 4 to 8 week plan that uses a check -off sheet is best.
7. Help your child design a safe project that is not hazardous in any way.
8. Provide transportation to such places as libraries, nature centers, universities, etc. that can help your child find project information.
9. Help your child write letters to people who can provide help on the science project and be sure the letters are mailed.

To The Teachers

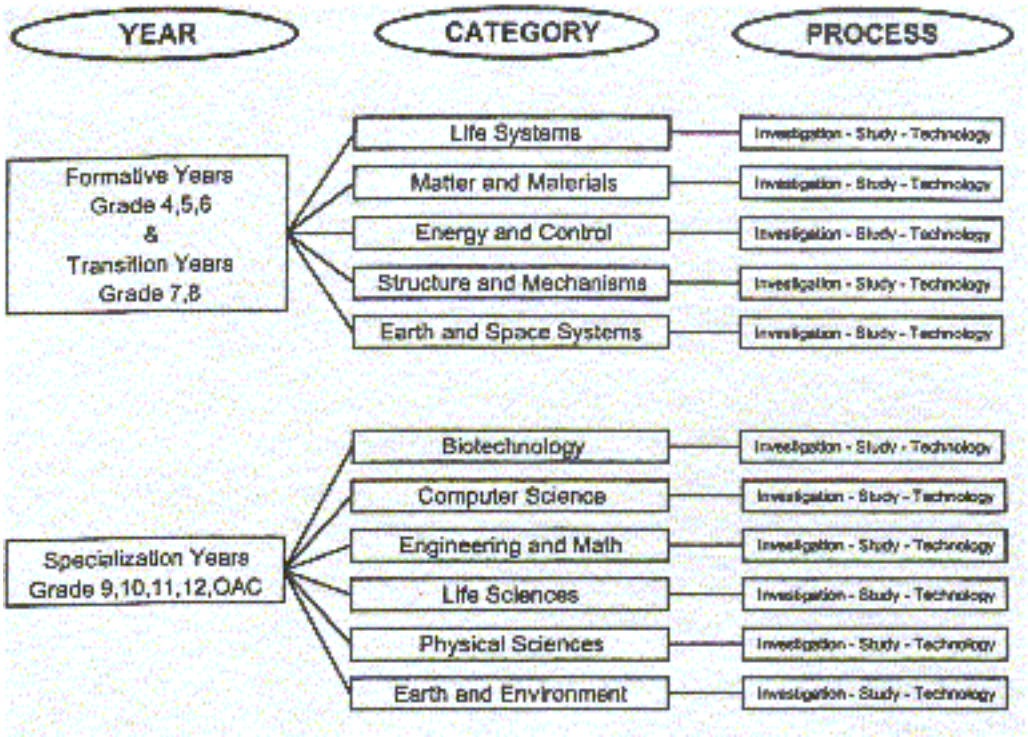
Incorporating an independent, integrated science project within your Math/Science/Technology curriculum can add a lot of enjoyment to your teaching. It provides another developmental stage of your team teaching plan. It also presents another opportunity for success for your students and a chance to develop some of their talents.
Some suggestions to improve success for your students:
Prepare ahead of time.
Allow students to build upon a successful topic from year to year. This is more typical of scientific research.
Help guide your students into a choice of topic, approach and level of difficulty that will generate the greatest interest, excitement and success.
Provide a clearly defined evaluation guideline or rubric that can encourage your students to reach for higher achievements.
Provide a risk free environment to encourage your students to explore to their fullest potential. Allow students to accept a level of competitiveness that they are comfortable with.
Suggestions for Judging:
Judging at a school level fair is not the teacher's responsibility. Every community has several qualified volunteers who would gladly judge student's work. Inviting secondary school students (especially alumni) is a great idea too. It is a huge learning opportunity for them and may even allow each project to be

judged twice. After independent judging, pairing students with adult judges in teams of two for discussion and consultation works especially well. You are welcome to use the judging forms used at the district fair.

PREPARE YOUR JUDGES

Thirty minutes of input from you with your judges on:
The form, categories, process, your students have used etc...
The standards you wish to implement...
Possible questions to ask students...
... is time well spent

Year, Category And Process



YEAR: determined by the grade of the presenter
CATEGORY: determined by the content of the project. Each project should be placed in the category that best describes the nature of the project.
PROCESS: determined by the process used in the project. For

more information on processes see the page entitled **THREE DIFFERENT APPROACHES TO YOUR PROJECT**.
Registration and Judging is based on the particular combination of year, category and process of each individual project.

What Safety Regulations Must I Meet?

General Safety Guidelines for Science Fair Experiments

Please go over the health and safety guidelines carefully with students who wish to participate in the regional science fair. These are the same guidelines used for the Canada Wide fair. On the day of the Bluewater Regional Science and Technology Fair, all projects will be checked regarding health and safety issues. Students may be required to remove certain substances or objects from their displays. Please ensure that projects going to the Bluewater Regional Science and Technology Fair comply with the accompanying health and safety guidelines.
HUMAN SUBJECT EXPERIMENTS must not involve any degree of risk to voluntary subjects whatsoever. Risk may be associated with exercise, emotional stress resulting from invasion of privacy, or ingestion of any substance. Be aware of any possible risks and use common sense.
NON HUMAN VERTEBRATE ANIMALS must not be harmed in any way. Perhaps a non vertebrate may be substituted. *Note: vertebrate animals are any organism with a backbone. A fish is a vertebrate.* Cells and animal parts (including organs, tissues, plasma or serum) purchased or acquired from biological supply houses or research facilities may be used in science fair projects, but should not be displayed at the fair. Evidence of the source of the materials (e.g.. bill of sale) must be available at the display.
PATHOGENIC AGENTS including viruses, viroids, prions,

rickettsia, fungi, or parasites should not be used for experiments except under close supervision of a Qualified Scientist or Designated Supervisor. Baker's yeast and brewer's yeast are not considered pathogens.

CONTROLLED SUBSTANCES such as tobacco, alcohol, black powder, over the counter drugs or other therapeutic substances may only be used under strict supervision of a Qualified Scientist or Designated Supervisor.

RECOMBINANT DNA studies require direct supervision by a trained teacher or Qualified Scientist and should include consultation with a university or medical centre.

HUMAN AND NON HUMAN ANIMAL TISSUE may be used provided the tissue sample is obtained from a research institution, biological supply house or biomedical scientist. Blood tissues must be documented free of HIV and hepatitis B and C, handled according to the Occupational Safety and Health Act and supervised by a Qualified Scientist.

HAZARDOUS SUBSTANCES OR DEVICES may only be used under supervision of a designated supervisor who will be directly responsible for overseeing student experimentation. Hazardous substances or devices include chemicals, lasers, radiation or radioactive substances, isotopes and firearms. In the case of hazardous chemicals, the Material Safety Data Sheets (MSDS) should be consulted first.

Students are responsible for knowledge and adherence to all Municipal, Provincial and Federal laws governing the materials and use of those materials. Students should not have on display materials that display the following symbols:

Compressed Gas

Flammable & Combustible

Corrosive

Dangerously Reactive

Oxidizing

Division 1

Poisonous & Infectious

Division 2
Poisonous & Infectious

Division 3
Poisonous & Infectious

Safety Guidelines for Project Displays at the Bluewater Regional Science and Technology Fair

The following list of objects or materials are unacceptable for display. If any of these objects or materials are a part of your project they must be represented in some other fashion, such as a photograph, safe model or coloured water.

Living organisms (including plants)*
Taxidermy specimens or parts
Preserved vertebrate or invertebrate animals
Human or animal food
Any human tissues (i.e. blood) except for teeth, hair, or nails, dried animal bones or samples contained in microscope slides soil* or waste samples
Laboratory chemicals
Poisons
Drugs
Controlled substances
Hazardous substances or devices
Dry ice or other sublimating solids
Sharp items
Flames or highly flammable materials
Tanks that previously contained combustible materials
Batteries with open top cells
Class III or IV lasers

* *The committee does not wish to discourage students from engaging in science fair projects using plants or soil. Students **may bring plants, soil or compost to the Bluewater Regional Science and Technology Fair**. Photos and/or video may also be used to show these materials for display purposes. Intermediate/Senior students who are chosen to represent our area at the Canada wide fair will have to come up with alternative methods for displaying plant and soil materials as these are **strictly forbidden at Canada Wide**. Since students go to the Canada*

Wide fair from all provinces, there is a concern that contaminated plants or soils from one province may be transported to other provinces. Students working with any of the materials on this page are advised to document their procedures well with photos or video.

In addition, the following cautions apply:

Shield all moving belts, pulleys, chains, or moving parts that are under tension or have pinch points
Maximum operational voltage of 125 volts for display
Class II lasers must have adequate protective housing and caution signs
Shielding for large vacuum tubes or dangerous ray generating devices
Pressurized tanks that contain non combustibles must be secured
Insulation around any heat sources
Shielding around high voltage devices
Good quality electrical cords of adequate capacity
All 125 volt connections must be soldered or made with approved connectors

Project Assessment

For a copy of the judging form, go to the Science Fair conference and check the Judging Form folder at the top of the page.

Check out more helpful teacher and student information for presenting Science Fair projects on our Web Site at:

http://www2.bwdsb.on.ca/~brstf/guide/