Science Fair Foundation BC
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2018 Science Fairs
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Science Fair Guide

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We acknowledge the financial support of the Province of British Columbia.

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Introduction

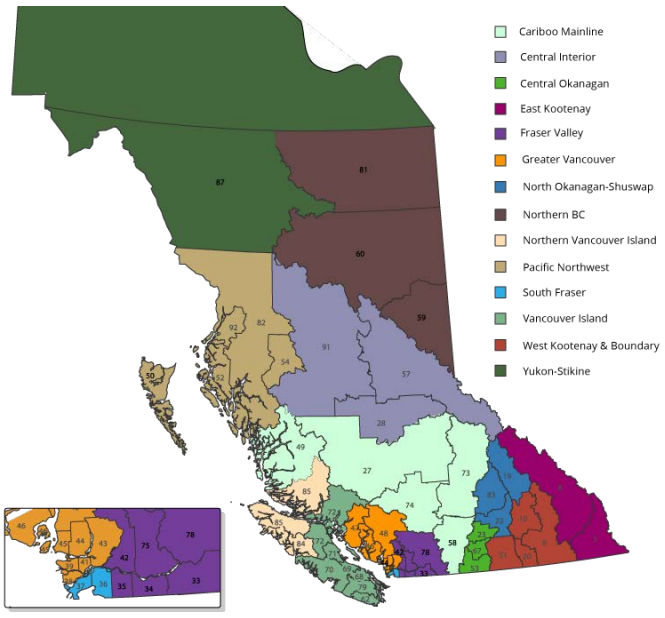
Science Fairs offer students the opportunity to create original scientific research, innovative projects and develop 21st Century learning skills; critical and creative thinking, collaboration and communication. Projects can be displayed at various levels of competition: school, district, regional, national and international.

Students who develop Science Fair projects always agree that they enjoy project-based learning while investigating the world around them. Their Science Fair project work provides an opportunity to extend science beyond the classroom and to take an in-depth look at topics that are of interest to them personally.

The finalists from the Regional Science Fairs are invited to attend the national fair where they share a week of competition, socializing, cultural activities, scientific tours and workshops with their like-minded peers. The Youth Science Canada showcase event, the Canada-Wide Science Fair (CWSF) is the largest extracurricular youth activity related to science and technology in Canada. Each year, 500 young scientists are chosen to compete from the top ranks at over 100 regional science and technology fairs staged across the country. Some students also go on to attend international Science Fairs.

BC Regional Science Fairs

Science Fairs offer students in grades 4 to 12 the opportunity to create original scientific research or innovative projects which are then displayed at various levels of competition. Science fairs are offered at school, district, regional, national and international levels. Supported by the Science Fair Foundation BC 14 regions of the province will hold local science fairs in February, March & April where students will be selected for Team BC - to represent their region at the Canada-Wide Science Fair to be held in Ottawa, Ontario from May 12 to 19, 2018.



Grade categories at the Canada-Wide Science Fair Level

Junior	**Intermediate**	**Senior**
Grades 7 and 8	Grades 9 and 10	Grades 11 and 12

Types of Projects

Experiment

An experiment involves the undertaking of an investigation to test a scientific hypothesis by the experimental method. At least one independent variable is manipulated; other variables are controlled. The best experimental projects involve original experimental research in which most significant variables are identified and controlled, and in which the data analysis is thorough and complete.

Innovation

An innovation involves the development and evaluation of new devices, models, theorems, physical theories, techniques, or methods in technology, engineering, computing, natural science or social science. The best innovation projects either integrate several technologies, inventions or social/behavioral interventions or else they design and construct an innovative application that will have human and/or commercial benefit. Alternatively, the best innovations may unify two or more existing physical theories and make verifiable predictions.

Study

A study consists of the analysis of, and possibly collection of, data or facts using accepted methodologies from the natural, social, biological, or health sciences. These include subjective studies involving human subjects, biology field studies, data mining, pattern recognition in physical data, etc. The best projects of this type correlate information from a variety of peer-reviewed publications and from systematic observations, and reveal significant new information or original solutions to problems. Quantitative studies should include appropriate analysis of some significant variables using mathematical, statistical or graphical methods. Qualitative and mixed methods studies should include a detailed description of the procedures and/or techniques applied to gather and/or analyze the data.

Getting Started

Here is what you should do once you have chosen your topic:

Research your Topic

Read books from the library; observe related events; gather existing information; look for unexplained or unexpected results. Talk to professionals; write to companies; obtain or construct needed equipment.

Organize and Theorize

Organize your research. Narrow down your hypothesis by focusing on a particular idea.

Make a Timetable

Choose a topic that can be completed in the amount of time you have. Identify important dates. Allow plenty of time to experiment and collect data. Leave time to write a paper and put together an exhibit.

Plan your Experiment, Study or Innovation

Write a research plan to explain how you will do your experiment.

Ethics and Safety Pre-Approval

To ensure that your project will be eligible to compete, complete the Ethics and Safety Interactive Flowcharts at https://secure.youthscience.ca/sfiab/gvrsf/s_ethics.php and visit the Youth Science Canada website at www.ethics.youthscience.ca.

Consult your Teacher/Supervisor

Discuss your work with an adult supervisor on an ongoing basis.

Conduct Your Experiments, Study or Innovation

Keep detailed notes of every experiment, measurement and observation. Change only one variable at a time when experimenting. Include control experiments in which none of the variables are changed. Include sufficient numbers of test subjects in both control and experimental groups.

Examine Your Results

When you have completed your experiments, examine and organize your findings. Did your experiment give you the expected results? Was your experiment performed with the exact same steps each time? Are there other causes that you had not considered or observed? Were there errors in your observations? If possible, analyze your data statistically.

Draw Conclusions

Which variables are important? Did you collect enough data? Do you need to conduct more experimentation?

Helpful Hints

- Your title should be simple and represent your research accurately.
- If elements of your project cannot be safely exhibited at the Fair, incorporate photographs of important phases of your experiment to use in your display.
- Photographs of people require their consent.
- Your display should be presented logically and be easy to read. When you arrange your display, imagine you are seeing it for the first time.
- Make your display stand out. Use neat, colourful headings, charts and graphs. Homemade equipment, construction paper and coloured markers are excellent for project displays. Pay special attention to the labelling of graphs, charts, diagrams and tables.
- Be sure to adhere to the size limitations and safety rules when displaying your project.
- Make sure your display is sturdy.

Nature of the Project

There are four essential components to a good Science Fair project.

1. Investigation and Design

Having selected your topic, follow the eight steps outlined in the Getting Started section of this booklet (page 7). For entry into the Science Fair, determine how to best classify your project based on exhibit challenge, grade category and type of project. Consult with your teacher and the Chair of your Regional Fair and follow the information from page 7 to 9 of this booklet to make these decisions.

2. Written Materials

A Science Fair project requires the following written materials.

Abstract

An abstract is written once your research and experimentation are complete. It should include a statement of the problem/purpose of the experiment, the procedures used, your data and your conclusions. For the Canada-Wide Science Fair, your abstract must not exceed five double-spaced typewritten pages. Check locally for requirements of your Regional Fair. Abstracts are distributed to the judges to familiarize them with the project. The abstract is evaluated as part of the project.

Project Data Book

A project data book should contain accurate and detailed notes to demonstrate consistency and thoroughness to the judges and to assist you with your research paper.

Research Paper

A research paper includes the following:

Title Page:	Centre the project title and put your name, address, school and grade at the bottom right.
Table of Contents:	Include a page number for the beginning of each section.
Introduction:	Include your hypothesis, an explanation of what prompted your research and what you hoped to achieve.
The Experiment:	Describe in detail the methodology used to collect your data or make your observations. Include enough information for someone to repeat the experiment. Include detailed photographs or drawings.

Discussion:	Thoroughly discuss exactly what you did in your project. Your results should be compared with theoretical values, published data, commonly held beliefs and/or expected results. A discussion of possible errors should be included as well as how the data varied between repeated observations, how your results were affected by uncontrolled events, what you would do differently if you repeated the project and what other experiments could be conducted.
Conclusion:	A summary of your results.
Acknowledgements:	Credit individuals, businesses and educational or research institutions which assisted you. Identify financial support or in-kind donations.
References:	List any documentation that is not your own (i.e., books, journal articles).

3. Display

The project should attract and inform, make it easy to assess the study and results, and make the most use of space with clear and concise displays.

The display should include headings that stand out, posters containing written material and charts, clearly drawn and correctly labelled graphs and diagrams and some of the apparatus used so that key aspects of the project can be demonstrated.

4. Backboards

Backboards are an essential element for display of projects. Backboards are to be constructed of materials that are unlikely to ignite and in the presence of fire will not allow flame to spread readily or produce toxic fumes.

Additional backboard suggestions:

- Air pockets should not be left behind any paper used to decorate the backboard.
- Overlapping sheets of paper are not acceptable.
- Panels may be painted with any common paint.
- Peg board allows flexibility for arranging three-dimensional exhibits.
- White pine should be used for bracing, framing and other woodwork.
- Removable pin hinges and wing-nut bolts save assembly time and assist maintenance.

Please refer to the Youth Science Canada website for more information on display regulations at: https://www.youthscience.ca/policy/cwsf-project-displays.

Canada-Wide Science Fair

Each year, the Canada-Wide Science Fair (CWSF) brings hundreds of Canada's brightest young minds together to compete, network and foster interest in science at the highest level of Science Fair competition in Canada.

In 2017, 65 participants selected from the 13 regions throughout BC and the Yukon presented projects at the University of Regina at the 56th CWSF. Team BC (above) brought home 106 awards and scholarships including 5 gold medals, 14 silver medals, 16 bronze medals, 17 Special Awards and 54 Scholarships!

Taiwan International Science Fair

BC students who have attended a minimum of 2 Canada-Wide Science Fairs are eligible to apply for the Taiwan International Science Fair.

In 2017, Olivia Li received a Bronze Medal in the Microbiology category for her project *A Novel Selection Process for the Conversion of Conventional Bacteria into Electrotrophs*. Elizabeth Schulz received a Silver Medal in the Animal Sciences category for her project titled *Investigating the Effect of Coloured Light on the Behaviour and Learning of Lymnae stagnalis*.

Science Fair Fun Run

The Fun Run is one of the largest event in BC's technology sector, the largest fundraiser for the Science Fair Foundation of BC and the largest timed 5K run in BC. It has received generous support from Vancouver's leading companies and institutions including representatives from the high-tech, biotech, financial, and legal communities, as well as local universities and schools. After the run, participants enjoyed giveaways, live entertainment, science experiments and free entry to TELUS World of Science.

The Science Fair Fun Run attracted nearly 1,200 participants in 2017 raising over $40,000 for Science Fair Programming throughout BC! Over the past eighteen years, the run has raised over $1 million for The Dr. Michael Smith Science Fair Endowment in support of Science Fair programs across BC.

Still have questions? Please contact us and we will be happy to help you out!

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