

Celebrate Science in the Mountains!

The Canadian Rockies 11th Annual Regional Science Fair

Sponsored by the Rotary Club of Canmore



**Tuesday, March 20, 2018
Lawrence Grassi Middle School**

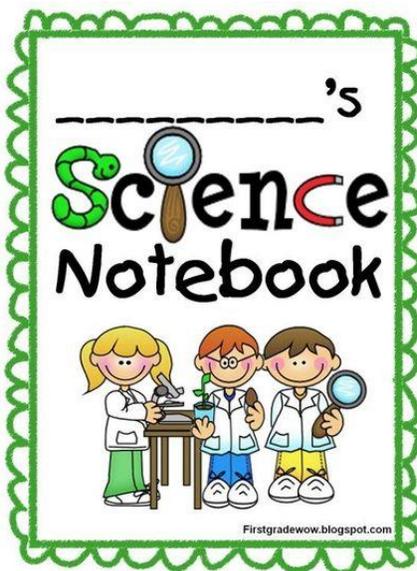


Student Handbook

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CANADIAN ROCKIES REGIONAL SCIENCE FAIR 2018

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WELCOME TO SCIENCE FAIR!



Introductory Information

- Letter to Parents and Students
- What is a Science Fair?
- What is the Parent's Role?
- What is the Student's Role?



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October 9, 2017

Dear Parents and Students:

Welcome to the eleventh annual Canadian Rockies Regional Science Fair! This year's Science Fair will be held on Tuesday, March 20, 2018 in the Lawrence Grassi Middle School gymnasium in Canmore. Science Fair gives students the opportunity to study a topic that interests them. Projects can range from areas such as sport, music, art, rocketry, psychology, chemistry, environmental science and computers. Through their projects, students will discover that science is found in every niche of the universe.

Science Fair also integrates all aspects of curricular learning, as the participants will be combining analytical skills, language skills, critical thinking skills and communication skills during the process of their inquiry, investigation and presentation. Further, science projects allow students to use the scientific method to develop an understanding of controls and variables and to practise data analysis. Many students will be undertaking original projects that will take them beyond the bounds of the classroom and textbooks.

The opportunities presented by Science Fair are limited only by imaginations and the results can be truly exceptional. We offer students in the Bow Valley this opportunity, knowing that some of them will become future scientists. In the larger context, we truly believe that all of the participants will gain insights into the world of learning and knowledge that is waiting to be discovered.

Please mark your calendar with the following important dates!

Friday, December 15, 2017	4:00 pm	Registration deadline.
Tuesday, March 20, 2018	8:30 am	Students will be bussed from their school to Canmore (Attendance will be taken by teachers or parent volunteers while on bus) *As soon as students arrive, they will be allowed to set up projects in gym.
	9:20 – 11:00 am	Exhibit Judging * Parents and public are not allowed in the gym at this time!
	11:00-11:45 am	Public/School Viewing (Students must not take down projects until after viewing is over. Everyone will help with take down at 11:45.)
	12:00-1:15 pm	Lunch for Participants (not provided)
	1:30– 2:30 pm	Awards Ceremony (BCHS gym)



Canadian Rockies Regional Science Fair

What is a Science Fair Project?

A Science Fair Project is an inquiry of a specific science topic that begins with a question or problem and follows a specific method of investigation. The question can be an independent experiment, innovation, or study that is designed, carried out, and presented by the student. Definitions for the above are as follows:

- ❑ An **Experiment** is an investigation undertaken to test a specific hypothesis using experiments. Students are to devise and carry out original experimental research, which attempts to control or investigate most significant variables. Students are expected to perform as many trials as possible to get sufficient data for analysis and conclusions.
- ❑ An **Innovation** involves the development and evaluation of innovative devices, models, techniques or approaches in fields such as technology, engineering or computers (both hardware or software). Innovative technological systems that will have commercial and/or human benefit are examined here. Students are expected to also perform trials on their innovation and follow the scientific method.
- ❑ A **Study** is a collection and analysis of data to reveal evidence of a fact or a situation of scientific interest. It could include a study of cause and effect relationships involving ecological, social, political or economic considerations; in depth studies; theoretical investigations. Variables, if identified, are not feasible to control. An in-depth statistical analysis of data is also required.

What is the Parent's Role in Science Fair?

Parents are invited to work along with their son/daughter as he/she selects, investigates, and reports on an appropriate area of science. With parental interest and encouragement, students can develop the skills and attitudes they need to make their project a valuable experience. Parents are asked to encourage their children to do most, if not all of the work. Although it is tempting to help your son/daughter make the “perfect” science fair project, it is most important that they wrestle with solving their problems as learning is in the doing. Guide your child whenever and wherever you can, but let the final project reflect his/her individual effort and design.

This package of materials will help you assist your son/daughter for the Science Fair. These guidelines will give you and your son/daughter ideas on how to create an effective project. Plan to take some time every now and then to talk these suggestions over with your son/daughter.

Additionally, support from school is always available. Please do not hesitate to contact the teachers or Mrs. Worobey if you have any questions, concerns or comments.

Remember that ribbons, trophies, or certificates will not measure your child's success in our Science Fair. Your son/daughter will succeed by learning and understanding more about science and how scientists work. Awards are secondary. The real goal of the Science Fair is to stimulate your son's/daughter's curiosity about examining the evidence of science in our everyday world in

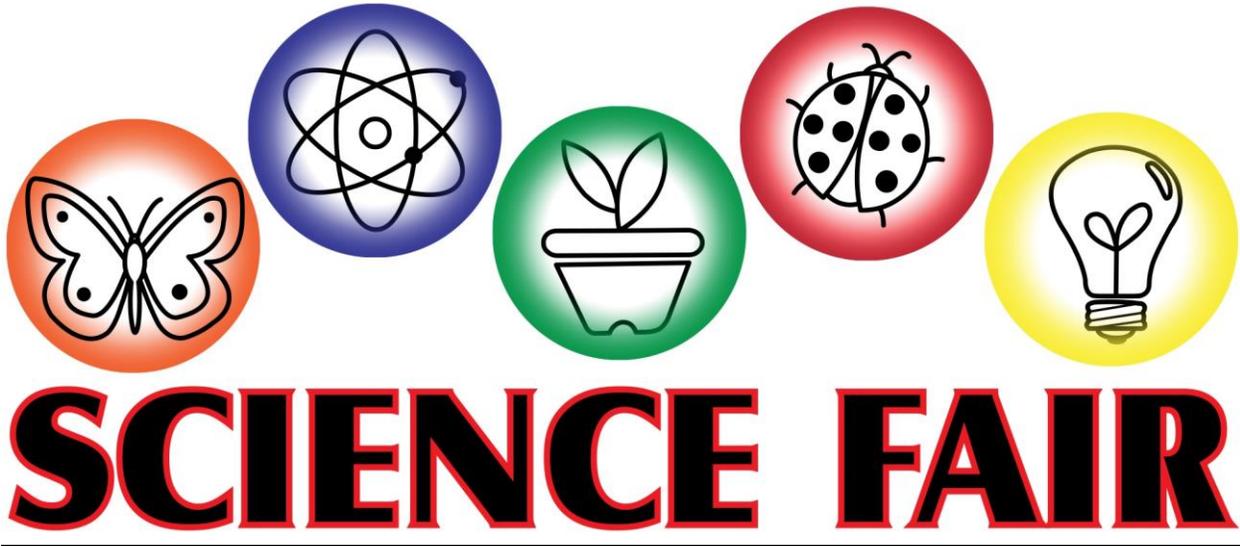
an authentic, self-directed science inquiry.

What is the Student's Role in Science Fair?

1. It is your role, as student, to choose a topic that interests you (you may work with a partner) and work cooperatively with resources such as your teachers, your parents, and anyone else who can help you carry out the scientific process regarding your topic.
2. You must perform research regarding your topic so that you have background knowledge and information to support your findings and/or provide extra information to judges. Record your findings in a book set-aside specifically for Science Fair (i.e. logbook). Record, record, record!!! Keep an ongoing record even if it is in rough notes of whom you talked to, what you read, when you worked on your project etc.
3. Plan your time wisely. Science Fair is designed so that you have ample time to choose a topic, collect materials needed, perform as many trials as possible if you are doing an experiment, analyze your data, do research, and construct your exhibit. Make sure your proposal sheets (if used in class) are included in your logbook as they reflect the ongoing scientific process.
4. You are responsible for setting up your project according to your assigned number and category on the assigned set-up day and time.
5. The day of competition, ensure you are wearing appropriate clothing (i.e. no ripped jeans, spaghetti straps etc.) Bring a bag lunch and forms of entertainment (i.e. book, headset, cards etc.) as you will not be allowed to leave your assigned spot until judging is completed. Awards will be given at the end of the day. Do not take your project down until all judging is complete and public viewing time has ended, as you do not want to disrupt other students who are being judged, and other members of the public would like to view your work.



Science Fair!



General Information

- Science Fair TO DO List
- Required Elements of a Science Fair Project
- Judging Criteria

Suggested DO List

TO

Use this list as a guide to set up a work time line for yourself. Set goals for yourself and try to stick to them.

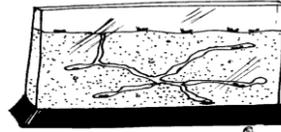
October

- Brainstorm project ideas.



- Pick a project and get it approved by teacher (You may work with a partner)
- Check resources (school, internet, Public Library, experts you may know)
- Contact experts that you know of in the field for advice
- Word the problem in a hypothesis
- Determine the variables you are going to measure and those you will keep constant (manipulated, controlled, responding)
- Design an experiment, innovation or study and get it approved by teacher
- Obtain equipment

November



- Do as many trials as you can!!
- Put all work into logbook, which must be part of your presentation.
- Collect and record all data.
- Take pictures or draw pictures of your process and results.
- Research for background information on your topic
- Complete Proposal Sheet #1 (optional)

December

- Continue with research.
- Continue performing trials and gathering data.
- Continue recording in your logbook!
- Complete Proposal Sheet #2! (optional)

January

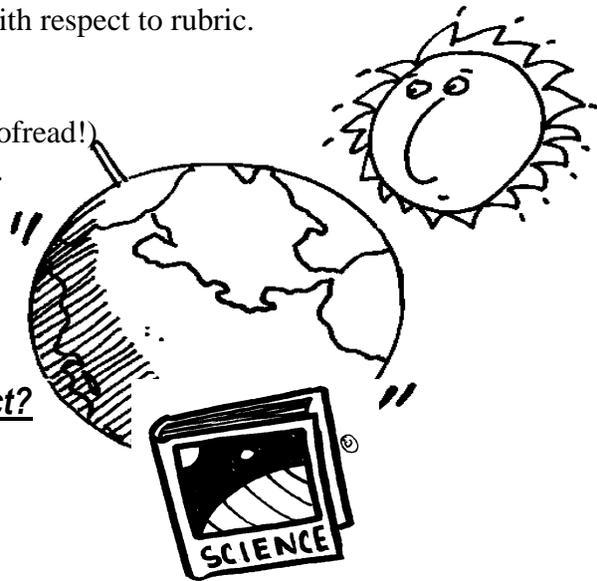
- Organize your data into charts and graphs.
- Analyze data...what are your results saying?
- Complete other information required in the Scientific Method.
- Put together your logbook.

February

- Get parents to proofread your logbook and check it with respect to rubric.
- Complete Proposal Sheet #3! (optional)

March

- Complete the display on your backboard (Have it proofread!)
- Practice presenting your project to friends and family.
- Set up project.
- Science fair Day!!!



What are the required elements of the Science Fair project?

There are two required elements of your Science Fair project:

1. The Logbook
2. The Presentation

1. The Logbook

The logbook will be divided into two separate sections.

Part A: The first part will be the good copy of the scientific report

Part B: The second part will consist of the rough draft and diary portions of your records. It helps to have labeled dividers separating these two sections.

Part A: The Scientific Report

Regardless of the METHOD OF INVESTIGATION you use to research your Science Fair project, you are expected to follow scientific methods as you carry out your investigation. The steps may vary slightly with a study or an innovation therefore we suggest you check with a science teacher if you are NOT doing an experiment. Use this information as a guide for your scientific report. Not only will it guide the steps you will need to follow, it will form your original work. Once you have completed your investigation using the scientific method, a “good copy” of the scientific report is required. This should be presented neatly, preferably word processed, in a binder or duo-tang and include all the scientific methods outlined in the following table. This information is also condensed and presented on your display board.

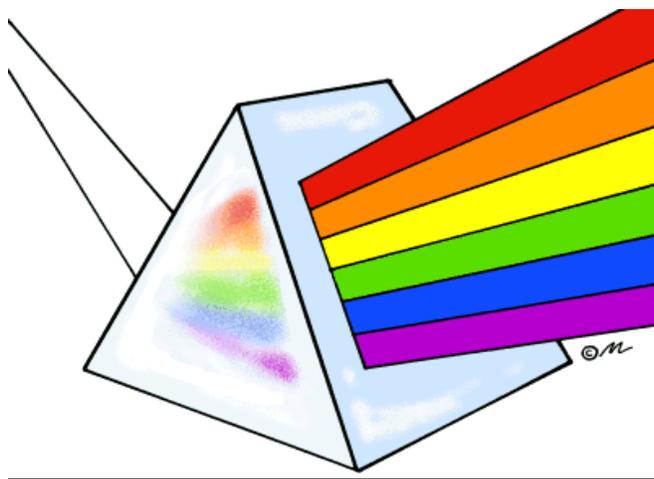
SCIENTIFIC METHOD

TITLE	What is the name of your Science Fair project?
PURPOSE OR QUESTION	What are you trying to find out?
HYPOTHESIS	Your guess as to what the answer might be
VARIABLES	CV: What variables might affect your results and must be considered and controlled? MV: What are you changing? RV: What are you measuring?
MATERIALS AND DESIGN (Diagram)	A complete list of all materials, amounts, temperatures etc.. and equipment used. A labeled picture or drawings of your apparatus is also helpful.
PROCEDURE	Point form, detailed, step by step description of how the experiment was carried out
OBSERVATIONS	Data collected in the form of tables and displayed in graph form
ANALYSIS	Statistical analysis and written explanation of your results
CONCLUSIONS	Based on your data, what is the answer to the question asked at the beginning of the experiment
APPLICATIONS TO SOCIETY/ AREAS FOR FURTHER RESEARCH	What importance to society is your project and your results? What other projects/questions could this lead to for a future year? i.e. areas of further research?
SOURCES OF ERROR	What went wrong and how could you do it differently another time?
ACKNOWLEDGEMENTS	At the very end of your project include the names of those who helped you and how they helped you.

Part B: Original Work and Resources

This part will contain your original ideas, brainstorming sessions, interview notes, data and observations. This should not be rewritten or typed out. All writing should be in the original form. It does not matter if your writing is in pen or pencil. There are forms in this Handbook to help you organize and record your ideas.

Brainstorming Section	This includes your jot notes and ideas for projects, places or people you talked to for ideas.
Interview Notes	Notes from people you talked to: mentors, teachers etc.
Proposal Sheets	There should be 3 of these (only if your teacher has required them). They indicate the process you went through while working on your project.
Science Fair Log Book Sheet	This is a diary of daily, weekly and/or monthly work.
Rough Work	Original work, diagrams, results. Include a rough draft of your science fair report.
Bibliography	This should be a complete list of all resources used for your project. If the Internet was used, you must state the addresses of the sites you visited. If you interviewed people, the names and phone numbers should be included.



2. The Presentation:

The presentation includes your display and how you present your work to the judges. An average of the judges' marks will be taken to determine your final mark.

There are 3 components to your presentation:

Part A: The Display

Part B: Equipment

Part C: Actual presentation to judges.

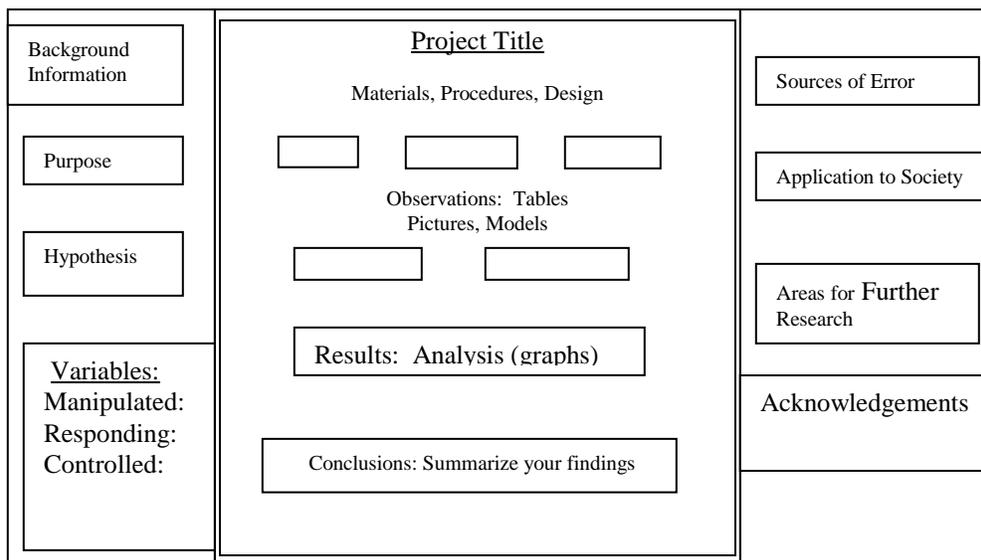


PART A: The Display

1. You will require a backboard (provided with registration).
2. Lettering should be neat and large enough to be easily read from a distance of 10 feet.
3. Proofread before and after so that there are NO spelling errors!
4. Use bright, distinct colors and borders around all writing.
5. Set up your backboard display as below.

Hint: Summarize key points from your data, do not cut and paste the entire report onto the display! The following diagram is an example of how a display board should be organized.

It is also recommended that you make a title board out of covered cardboard and place it on top of your presentation board.



Display Checklist: What Makes a Good Science Fair Display Board?

Does your display board include key information from the scientific report?	Yes/No
Are the sections on your display board organized like a newspaper so that they are easy to follow? (You need subtitles in larger font overtop of your information)	Yes/No
Is the text font large enough to be read easily? (At least 16 points font)	Yes/No
Does the title catch the reader's attention and is the title font large enough to be read from across the room?	Yes/No
Did you use pictures and diagrams to effectively convey information about your science fair project?	Yes/No
Have you constructed your display board as neatly as possible? (No loose paper)	Yes/No
Did you proofread your display board?	Yes/No

PART B: The Equipment

If possible, the equipment used in the experiment should be displayed. Judges are particularly interested in equipment, which the entrant has constructed. It is important that the equipment not hide information on the backdrop. It is often a nice touch to cover your table with a cloth on which you set your equipment/apparatus. Any electrical cords are your responsibility. They must be taped to the floor using proper floor tape for safety.

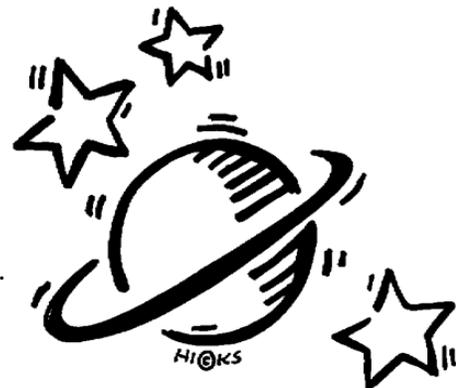
PART C: The Oral Presentation

An oral presentation is given to all judges and members of the public on the day of the Science Fair. Here are some tips for a smooth presentation.

- Plan and practice how you will present your project to the judge.
- Never wait for the judge to ask you questions. It is up to you to explain to the best of your ability exactly what you did and what your results were.
- Take your time...you worked hard for this and the judges want to hear what you did.
- Remember eye contact is good always!! Try not to read directly from your display.
- Use cue cards if it will help.

The following method to begin your presentation will impress the judges:

- Stand up and push in your chair as the judge approaches.
- Shake hands with the judge and introduce yourself.
- Begin to explain your project as on the display.
- I was testing to see the effect of ____ on ____.
- My procedures were...
- My apparatus, design was...
- From my data I was able to conclude...
- End your presentation by asking if there were any questions.



JUDGING CRITERIA

Typically, judges will be giving marks, which include the following criteria. Keep this in mind while planning and preparing your project.

1. SCIENTIFIC THOUGHT- 45 POINTS

- ✓ Is the problem and hypothesis clearly stated?
- ✓ Is there an effective procedure planned for testing your hypothesis?
- ✓ Are ideas developed in a complete and logical progression?
- ✓ Does student show appropriate understanding of his/her project?
- ✓ Are all variables recognized, defined and controlled?
- ✓ Have observations been recorded in a table and analysis in a graph?
- ✓ Does the data support conclusions?
- ✓ Are there reliable and appropriate sources of information used?
- ✓ Has the student thought about how sources of error may have affected results?
- ✓ Does the student have an understanding of how her project ties in with related research?
- ✓ Is there any indication of application to society and areas for further research?

2. ORIGINALITY- 25 POINTS

- ✓ Is the topic or idea original?
- ✓ Does the student approach her idea or topic in an original fashion?
- ✓ Is there creative interpretation of data and information?
- ✓ Is there creative use of equipment?

3. SKILL-10 POINTS

- ✓ Is there skillful use of information sources?
- ✓ Does workmanship show planning and neatness?
- ✓ Is work appropriate for student level of ability?
- ✓ Is there appropriate level of adult assistance?

4. DRAMATIC VALUE-10 POINTS

- ✓ Is layout logical and self-explanatory?
- ✓ Does student use diagrams, models and writing?
- ✓ Is there use of color to enhance and clarify?

5. LOG BOOK- 10 POINTS

- ✓ Is logbook written concisely and neatly?
- ✓ Is/Are the information, data, diagrams and observations relevant to project?
- ✓ Logbook does not contain lengthy background information or pictures.



Science Fair



Student Planning Sheets

- Logbook
- Brainstorming Sheet
- Research Planning Sheet
- Proposal Sheets

SCIENCE FAIR BRAINSTORMING SHEET

Use this sheet to help you brainstorm ideas for your project. Please include it in your log book.

Possible Topics for my Project:

1. Topic Idea:

Materials I already have:

Materials I will need:

Help I will need with this topic: None _____ Some _____ A lot _____

How difficult will this be for me? Very _____ Somewhat _____ Easy _____

Where will I get my research material? (Printed and audiovisual materials I should find and read? Places I could visit? People I could talk to? Internet sites I could use? Supplies/ Equipment I need to acquire.)

Steps that need to be taken before beginning this idea: (Draw a bubble map or a flow map)

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Science Fair Proposal Sheet #1

Due: _____

Student Name(s) _____

1. Purpose: _____

2. Hypothesis/ Prediction: _____

3. Variables:

a) Manipulated Variable: _____

b) Responding Variable: _____

c) Controlled Variables: (List as many as you can think of)

4. Materials:

5. Design

6. Procedure (Point form in a list)

Science Fair Proposal Sheet #2

Due: _____

Student Name(s) _____

1. Purpose: _____

2. Hypothesis/ Prediction: _____

3. Variables:

a) Manipulated Variable: _____

b) Responding Variable: _____

c) Controlled Variables: (List as many as you can think of)

4. Materials:

5. Design

6. Procedure (Point form in a list)

7. Observations: If you have already begun your trials and have started collecting data, attach or include samples of the data you have collected. Are you noticing any patterns? What is your data telling you?

8. Conclusion: Answer the question you asked originally in the purpose/ problem. Was your hypothesis correct? Why/why not? What did you notice instead? Any errors in your procedure?

Science Fair Proposal Sheet #3

Due: _____

Student Name(s) _____

1. Purpose: _____

2. Hypothesis/ Prediction: _____

3. Variables:

a) Manipulated Variable _____

b) Responding Variable: _____

c) Controlled Variables: (List as many as you can think of)

4. Materials: _____

5. Design _____

6. Procedure (Point form in a list)

9. Observations: If you have already begun your trials and have started collecting data, attach or include samples of the data you have collected. Are you noticing any patterns? What is your data telling you?

10. Conclusion: Answer the question you asked originally in the purpose/ problem. Was your hypothesis correct? Why/why not? What did you notice

instead? Any errors in your procedure?

