

Cremona School

Science Fair

*** Gr. 5 - 12 Handbook***



Science Fair Date: February 7, 2018






Location: Cremona School Library

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Use this checklist to help you keep track of the items you need to complete while working on your project before the Science Fair.

To-Do:

-  Read through the handbook. Decide on topic/idea.
-  Hand in your entry form no later than December 22.
-  Begin working on project December 1 – February 6
-  Continue working on project. Collect and enter data into your logbook (Dec. - Feb).
-  Prepare your board and presentation.

Dear Parents,

This year's Science Fair will be held on Wednesday, February 7th, 2018 in the Library. 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.

- Scientific Project – Your child may choose from to do one of the following projects:
 1. Experiment
 2. Study
 3. Innovation
- Students (grades K-12) will have the opportunity to proceed onto the Mountain View County Science and Technology Fair in Olds. The students (grades 5-12) who win at the fair in Olds are able to advance to the Regional Science Fair held in Red Deer. The projects (grades 7-12) which rank high in Red Deer have the opportunity to advance to the National Science Fair – this is an expense paid trip to the city hosting the National Science Fair in Canada.

Students have the option to work with a partner on a project. When choosing a partner, please keep in mind that their project will be judged according to the highest grade represented. E.g. A project with a grade 5 and a grade 6 student will be judged as a grade 6 project.

If you have any questions or concerns please contact Miss Frank at the school 403-637-3856.

Sincerely,

Miss Frank

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 child as he/she selects, investigates and reports on an appropriate science topic. Parental interest and encouragement enables students to develop the skills and attitudes they need to make their project a memorable and learning experience. Parents are asked to encourage their student to do most, if not all of the work. Parental involvement varies with the age of your child and how many projects your child has completed. When your child attempts their first project, regardless of their age or grade level, they will need guidance and assistance from peers, parents and teachers.

Remember to give your child the opportunity to explore and try to solve problems as they complete their project. It is great to give a variety of choice and solutions to all aspects of your child's project – keep in mind that the final project should reflect your child's individual effort and design.

The appearance of the display and the log book are a small portion of the mark when you refer to the judging sheets. In younger grades it is fine to have a parent help the child print or type the information. Most winners are not chosen by the neatness of their project, but by their knowledge of their project. Your child will present his/her project to the judges on their own. You are encouraged to practice with them at home. There is a page in this handbook that will give a sample

of how your child could present their project. Judges assess through the presentation and the questions they ask how well the child knows his/her project.

Information that is displayed on the board and in the logbook are key factors demonstrating your child's knowledge. Students are encouraged to use their board to assist them with their presentation. Have your child practice their project to a variety of audiences: yourself, friends, relations or teachers. Encourage them to use the board to guide them through the presentation, but discourage them from reading every word directly off of their display. The judging sheets are great guidelines. All three types of science projects need to follow the scientific method. These are outlined in this handbook under the title Scientific Method.

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.
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. 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.

What are the required elements of the Science Fair project?

There are three required elements of your Science Fair project:

1. The Logbook
2. The Presentation
3. The Project Summary

1. The Logbook

The logbook will be divided into two separate sections.

Part A: 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 Diary	This is a diary of daily, weekly and/or monthly work.
Rough Work	Work Original work, diagrams, results. Include a rough draft of your science fair report.
Bibliography	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.

Part B: The Scientific Method/Report

Regardless of the type of Science Fair project you choose to do (experiment, innovation, study), 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 information should be presented 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	Controlled Variables – What might affect your results and must be considered and controlled? Manipulated Variable – What are you changing? Responding Variable – What are you measuring?
Materials and Design (Diagram)	A complete list of all materials, amounts, temperatures, equipment used, etc. A labelled picture or drawing of your experiment is helpful.
Procedure	Step by step description of how the experiment was carried out.
Observations	Data collected. This information may be presented in the form of tables, charts or graphs.
Analysis	Statistical analysis and written explanation of your results.
Conclusion	Based on what your data from your experiment, what is the answer to the question you 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 questions could this lead to in future years?
Sources of Error	What went wrong and how could you do it differently?
Acknowledgements	At the very end of your project, include the names of those who helped you and how they helped you.

2. The Presentation:

The presentation includes your display and how you present your work to the judges.

There are 2 components to your presentation:

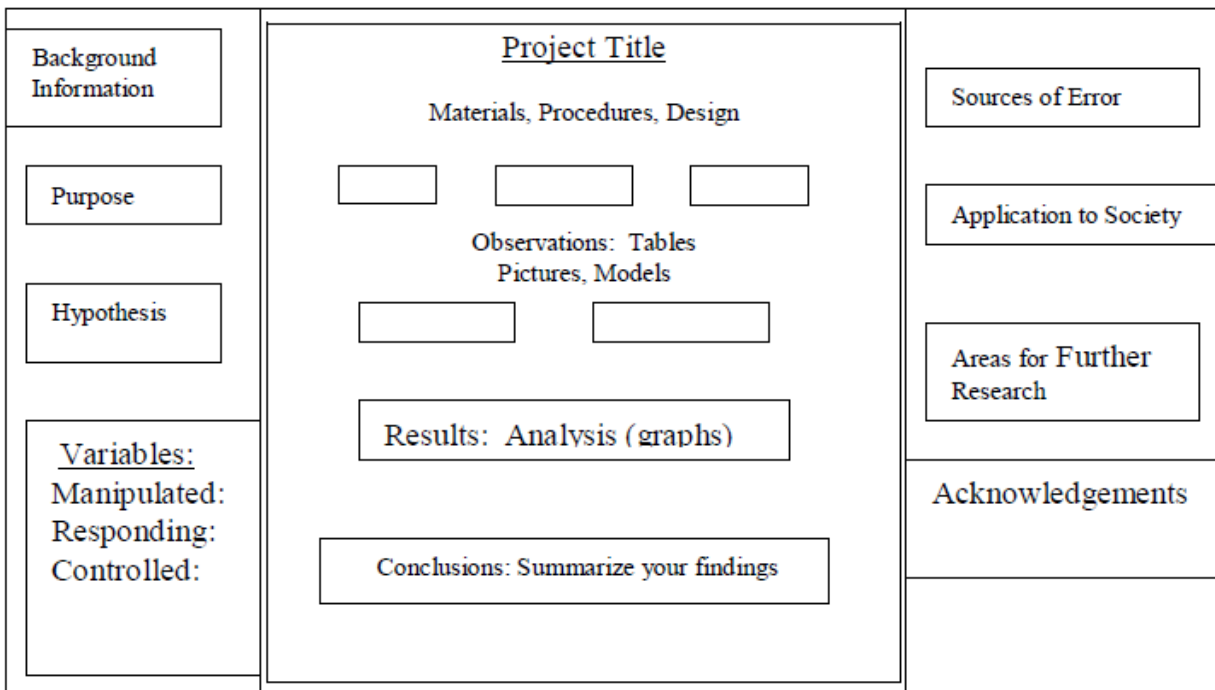
Part A: The Display

Part B: Oral presentation to judges.

PART A: The Display

1. You will require a backboard (available for purchase at the office).
2. Lettering should be neat and large enough to be easily.
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.



PART B: 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.

Below are some questions that the judges may ask you:

1. Where did you get the idea for your project?
2. What did you think would happen before you carried out your experiment? Why?
3. How did you go about proving your idea? What was your plan of action?
4. What was your controlled variable?
5. How did you control the other things?
6. Show me your log book. Where is your rough work?
7. Did you have troubles getting results? How did you deal with any difficulties?
8. Can you tell me what you found out about your project?
9. Can you use this study in real life? How?
10. Where did you get your information from?

3. *The Project Summary:*

A project summary is a short report that sums up the entire science project.

Guidelines:

- Grade 5-6 –Maximum of two pages (400 word count), plus title page.
- Grade 7-12 – Maximum of three pages (600 word count), plus title page.

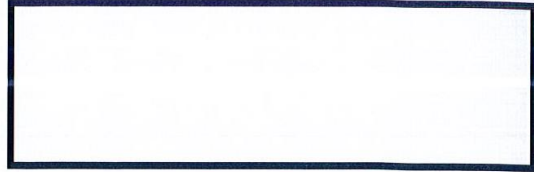
The project summary should be divided into five main parts:

1. A short description of the purpose of the project. Perhaps an explanation of how and why the project was chosen.
2. A summary of the methods or procedures followed.
3. A summary of the observations made and results obtained. Tables, graphs, diagrams may be used to illustrate.
4. A statement of the conclusion reached. Perhaps an explanation of how and why the conclusion was drawn. Perhaps an indication if further research is needed.
5. Bibliography – a detailed list of resources used.

Log Book Diary

You can use this sheet and make copies of it to record the dates and describe the work that you did on your project. Record ALL days. This includes brainstorming, experimenting, building of your display, etc. This sheet (or one you make yourself) should be included in your log book's "original work" section.

Date	Describe What You Did Towards Science Fair



1. Scientific Method (CHOOSE ONLY ONE CATEGORY – A, B, or C)

A. Experimental Project –an investigation undertaken to test a scientific hypothesis using experimentation, usually featuring the identification and control of variables

Hypothesis

- 1. Background research was integrated into the formation of the hypothesis.....0 1 2 3 4 5
- 2. The hypothesis related to the problem was clearly stated and provided direction for the project.....0 1 2 3 4 5

Method

- 3. Experimental design was clearly described and appropriate for solving the problem.....0 1 2 3 4
- 4. Manipulated and responding variables were identified and understood.....0 1 2 3 4
- 5. Variables that could be controlled and not controlled were recognized.....0 1 2 3 4
- 6. Repetitions of tests and /or appropriate sample size were used to achieve reliable results.....0 1 2 3 4
- 7. The progress of the project was recorded in a log book.....0 1 2 3 4

Analysis/Conclusions

- 8. Appropriate methods were used to present and analyze the data.....0 1 2 3 4 5
- 9. A connection was established between the hypothesis/objective and results.....0 1 2 3 4 5
- 10. The conclusions were supported by the data presented.....0 1 2 3 4 5

Total /45 _____

B. Innovation Project – the development and evaluation of innovative devices, models, or techniques in technology, engineering or computers

Problem

- 1. Existing knowledge and background research were integrated into the formation of the problem.....0 1 2 3 4 5
- 2. A problem was clearly identified and provided direction for the project.....0 1 2 3 4 5

Method

- 3. Suitability and limitations of the chosen materials/methods were understood.....0 1 2 3 4 5
- 4. The project design was efficient, effective and addressed the problem.....0 1 2 3 4 5
- 5. The project design was appropriately tested.....0 1 2 3 4 5
- 6. The progress of the project was recorded in a log book.....0 1 2 3 4 5

Analysis/Conclusions

- 7. A connection was established between the problem and results.....0 1 2 3 4 5
- 8. Testing was carried out to modify the project design and make adjustments as the project proceeded... 0 1 2 3 4 5
- 9. The student understood how well the problem was solved.....0 1 2 3 4 5

Total /45 _____

Scientific Method Cont'd (Choose only ONE category A, B or C)

C. Study Project – the collective and analysis of data to reveal evidence of a fact or situation of scientific interest, possibly including the study of cause and effect relationships or theoretical investigations of scientific data.

Problem

1. Background research was integrated into the formation of the problem..... 0 1 2 3 4 5
2. The problem was clearly stated and provided direction and appropriate scope for the project..... 0 1 2 3 4 5

Method

3. The information acquired showed depth and variety..... 0 1 2 3 4 5
4. The data gathered were reliable and appropriate (multiple independent sources were used)..... 0 1 2 3 4 5
5. The research data were comprehensive and well-organized..... 0 1 2 3 4 5
6. The progress of the project was recorded in a log book..... 0 1 2 3 4 5

Analysis/Conclusions

7. Data were critically analyzed..... 0 1 2 3 4 5
8. Conclusions were supported by the gathered data..... 0 1 2 3 4 5
9. New ideas were formulated..... 0 1 2 3 4 5

Total / 45 _____

2. Communication

1. Oral presentation clear, logical, concise and enthusiastic, using scientific vocabulary..... 0 1 2 3 4 5
2. Answers to questions were clear and signified depth of understanding..... 0 1 2 3 4 5
3. Research materials were properly documented with appropriate credits and citations given..... 0 1 2 3 4 5
4. Visual display was effective, logical and self explanatory layout..... 0 1 2 3 4 5
5. A concise, clear, organized written report accurately describing the project is presented..... 0 1 2 3 4 5

Total / 25 _____

3. Creativity and Insight

1. The project difficulty is appropriate for the grade level of the student..... 0 1 2 3 4 5
2. Approached the problem with originality..... 0 1 2 3 4 5
3. Indicated what improvements can be made to the project..... 0 1 2 3 4 5
4. Identified practical applications, further research or experimentation for the project..... 0 1 2 3 4 5
5. Has shown resourceful use of equipment and/or materials..... 0 1 2 3 4 5
6. The student demonstrated knowledge of the project..... 0 1 2 3 4 5

Total / 30 _____

4. Total Score

Add the scores from Sections 1 through 4 and record the final mark here.

Total /100 _____