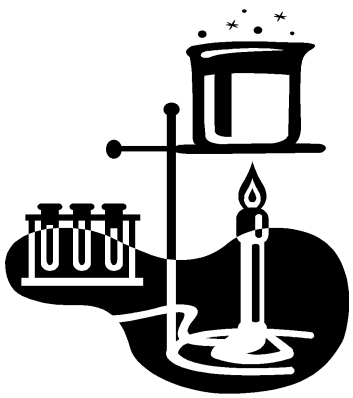
Fort Vermilion
School Division 52

FVSD SCIENCE FAIR

PROJECT PACKAGE



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Starting a Science Fair Project

"How do I start my Science Fair Project?"
This is a question that thousands of Canadian students ask every year and somehow they succeed beyond their wildest dreams, often ending up finding a passion that leads them through University or toward a career.

Coming up with a science fair project is not easy and here are some tips:

- Start thinking about a project early
- Set yourself a timeline
- Read broadly in your area of interest, especially current events in technology and environmental issues
- Keep notes on ideas
- Relax, and let inspiration strike you
- Don't give up!

Now to come up with a project.....
There are several different project types and project levels you should know about, but beyond that, there are some good ideas that involve excellent science.

Every time a company promises something their product will do, you may have a potential Science Fair Project. Perhaps you have an idea to use a product in a novel way. Product testing projects show up at every science fair and they can involve testing of over-the-counter drugs, cosmetics, soaps and /orautomotive products. To be done well they must involve extensive data collection and superior control of variables.

Issues in Your Community

Sometimes the things we know best are also the things we consider the least. Studying animals or plants that grow in your area can lead to exciting and valuable science. Do they have enemies that are being controlled with chemicals? Are there alternatives? Do they have special soil conditions that would improve their yield? Does the water or the air in your community affect living things? Studying the behaviours of people in our community can also be an excellent social science.

Modification of Design

Perhaps a relative working in an industry setting complains about something not working well or as well as it should. They might say “Why doesn’t someone make ….?” You could be the one to make this innovation.

Unexpected Questions

The world is full of questions and answers that do not answer anything. Reading the newspaper or watching television can provoke some of the best questions that you could look into. Listen to the people around you, your everyday life is full of questions. Try to find an answer by doing some preliminary research, and if an answer is not available you may have a project idea. Perhaps the answer raises other questions.

Extension of Existing Research

Finally, look at what other students have done for science fair projects. Try to avoid copying their projects but perhaps their idea raises new questions that you can follow up on.

7 Steps to a Science Fair Topic

1. **CHOOSE** a topic or a problem (ask a question)
    a. Choose two in case one is not practical, no books are available, or it is too expensive.
    b. Choice can come from life sciences, mathematics, physical sciences, engineering sciences, computers,…
2. **READ UP -** Use outside 'reference persons' if possible (e.g., professionals in the field of science…)
3. **SUGGEST** a possible answer to the problem question (hypothesis, if …then/because…)
4. **DESIGN** and do experiments to see if the answer is right
    a. Control variables.
    b. Change only one variable at a time
    c. Biological experiments need a control
5. **GET SOME RESULTS**
    a. Take some measurements and observations
    b. Make tables, graphs, diagrams, and do calculations
    c. Quantitative results are essential for validity
6. **TRY TO ANSWER PROBLEM QUESTION FROM RESULTS** to make conclusions
    a. If the answer is negative, try a new hypothesis or possible answer and re-design a new experiment.
7. **DISPLAY RESULTS**
    a. Answers should be displayed so other people can see your work and understand your problem in order to understand what you have done.

TYPES OF SCIENCE FAIR PROJECTS

The judging of scientific thought requires special attention. One important consideration is the existence of different types of projects. The most common types of science fair projects are Experiments, Studies and Innovations; some projects will contain elements of two or three project types. Projects of each type are equally capable of winning top awards at the Fair, providing they meet the necessary criteria.

An Experiment (K-12)
This is traditionally the most common type of science fair project in the life or physical sciences divisions.

Projects of this type involve an original scientific experiment to test a specific hypothesis in which the student recognizes and controls all significant competing variables and demonstrates excellent collection, analysis, and presentation of data. The judge should also realize that it is not essential that the project produce a significant positive finding. It is the design rather than the results that is most important.

Projects in this area must be able to demonstrate that the methods originally used to obtain the data are based on sound scientific techniques and controls and demonstrate insightful analysis.

An Innovation (4-12 only)
A project of this type would involve developing and evaluating new devices, models, techniques or approaches in fields such as technology, engineering or computers (both software and hardware).

Projects should integrate several technologies, inventions or designs and construct an original innovative technological system that will have commercial application and/or human benefit. It must demonstrate how the innovation was designed or developed on the basis of a sound understanding of the scientific, engineering or technological principles involved.

A Study/Research (K-12)
A study involves the collection and analysis of data from scientific literature or from field studies to reveal evidence of a fact, situation, or pattern of scientific interest. Variables are by nature difficult or impossible to control, but an effort to make meaningful correlations is encouraged.

Examples of studies would include an attempt to explain the disappearance of the dinosaurs, the collection of data on the habitat and distribution of a species, the effects of radiation on humans, particle physics as applied to a neutrino telescope, and the effect of sunspot activity on radio communications.

REGULATIONS FOR SCIENCE FAIR ENTRIES

1. Exhibits must be self-standing, stable and conform to maximum size guidelines: 3.5 m high (from floor level), 1.2 m side-to-side, 0.8 m front to back.
2. No open flames (matches, candles, lighters, etc.) are permitted.
3. Exhibits must not contain hazardous materials such as:
    - radio-isotopes
    - biological toxins
    - Micro-organisms or cultures harmful to human or animal life. All cultures on display must be sealed.
4. Lasers may be used in experiments but must not be operated during public display.
5. Live animals must not be displayed.

    NOTE: All experiments using animals must be carried out under the supervision of a science teacher. It is the responsibility of the science teacher to ensure that such experiments are safe and not harmful to the animals involved.
6. No containers of toxic or flammable chemicals are allowed.

    NOTE: Experiments using dangerous, toxic or corrosive chemicals should be simulated with safe materials such as salt or water.
7. Projects using or requiring electricity must be properly grounded; all electrical apparatus must be safe and in good repair. Exposed electrically "live" components must have a potential of less than 36V to ground. No voltages above 10kv are to be generated.
8. Investigators and their supervisors will be responsible for the safe display or operation of the projects for the duration of the Fair

As part of the student's science project, judging will take place on the following:

1. LOGBOOK - The logbook provides a chronological record of work the student has put into the project. It usually takes the form of journal entries outlining that work was completed and when.
    a. Sunday, Jan.2, 1-2 pm looked through information on acids and bases in library books. Decided to …….

2. WRITTEN REPORT - The written report summarizes what occurred in the experiment including the purpose, the results and the interpretation of the results. The report should clearly state what was learned from the experiment. The report can be no longer than 5 pages.

3. DISPLAY – The display should represent your science fair topic and a shows an organized and uncluttered summary of your Science fair project. The display can be used when presenting to judges.

4. PRESENTATION – You must be ready to present and have factual information about your project. Be ready to be questioned for any part of your scientific process and defend any queries judges may have.

The Scientific Method

Topic Research

Research is the process of collecting information from your own experiences, knowledgeable sources, and data from exploratory experiments.

Topic Research is used to select a project topic. For example, you observe that when baking soda and vinegar mix they give off a gaseous substance. Based on this experience, you decide to learn how substances mix to create new substances. Your topic will include **chemistry.**

The research you do here at the beginning should be carefully logged in your science journal in the proper section labelled **Topic Research**.

Project Research

Once you have discovered a topic for your science fair project, it is now time to zero in on a specific project. A topic like chemistry is huge, so you will need to research more about chemistry till you find a specific topic.

> For example, you observed liquids changing into gases, so you may look further into matter-changing states. As you research you discover sublimation (solid to a gas) and deposition (gas to a solid). Now your project research will help you to come up with a question.

Record your research and any possible questions in your journal in the section labelled **Project Research.**

Question

As a result of your project research, you will have asked several questions. One of these questions will be the specific problem you want to answer.

Record this question in your journal labelled **Question.** You may want to include some background research or reasons why you choose this question to refer back to later. It will help to keep you focused on the purpose of your experiment.

Hypothesis

A hypothesis is an educated guess as to a solution to the question you have asked. Note it is an educated guess because you have done a fair bit of research in this field of science.

You may have several different possible explanations. It is important to record all of them as you work through which seems to be the best. It will most likely be a combination of several. Finally, record your final hypothesis. All this information should be kept in your journal in the section labelled **Hypothesis.**

Materials

The experiment that you devise should be able to be repeated by anyone and get the same results. To do this others must know the materials you used.

In this section record all the materials you used, the quantities, name brands if applicable, and so on. As your experiment develops you may delete materials or add to the list. Be sure to make these changes in your journal.

Once you have the final procedure down and you are satisfied with your experiment, you can write up a final complete set of materials at the end of the section labelled **Materials** in your journal.

Procedure

The procedure is a set of numbered steps outlining the exact instructions you followed to test your hypothesis.

Before you begin your procedure you will need to define.

- ***Scientific terminology –*** terms and vocabulary that is related to and part of what you are studying

When conducting an experiment to enhance your study, you will need to define:

- ***Independent Variable:*** this is the variable you purposely manipulate or change. There should only be one variable tested at a time. If you have several variables you wish to test, your experiment will have to have several tests.
- ***Dependent Variable:*** the variable being observed that changes in response to the independent variable.
- ***Controlled Variable:*** these are variables that are not changed.
  - ***Control:*** all variables are identical, establish a baseline to compare your experiment to

Once these are defined in your journal in the section labelled **Procedures**, you can begin outlining the specific steps you will follow to test your hypothesis. Record these in your journal as well.

If you are conducting an experiment to enhance your study more, repeat your experiment more than once to verify your results. You can take just one set of results or average the results from several attempts.

Observations

You will need some format to record your observations of your experiment or research.

In your journal, draft possible charts, tables, and diagrams that could be used to record observations. Finalize a method to collect your data. Once you conduct your experiment, all your data should be collected and kept in your journal in the section labelled **Observations.** It will be required later when you do your project report.

Interpretation

Once you have collected all the data, you have to make some sense of it all. You must decide on some way to organize the data so that patterns can be found and a clear picture of what happened is illustrated.

Possible ways to organize data are in graphs (bar, line, circle, pie, etc.) Once the data is organized you will need to provide some explanation of the data. Explain what happened, and what your observations were. Avoid making conclusions at this point. Describe patterns, unusual results, exceptions, trends, and anomalies.

Research for Understanding

Before you can make proper scientific conclusions, you will have to go back to research. Finding out more information as to WHY things happened, WHY those trends exist, WHY those anomalies appeared, and so on. This information will help you to make a detailed and scientific conclusion based on facts and scientific principles.

This research should be included in your journal in the section labelled **Research for Understanding.**

Conclusion

The purpose of the conclusion is to provide a summary and a statement of how the results relate to the hypothesis. Reasons for experimental results that are contrary to the hypothesis are included. If applicable, the conclusion can end by giving ideas for further testing.

Don't change your hypothesis.

Don't leave out experimental results or research findings that do not support your hypothesis.

Do give possible reasons for the difference between your hypothesis and the experimental results or research findings.

Do give ways that you can experiment or define your study further to find a solution.

Do try to answer the question you asked at the beginning of the experiment.

Project Report

The Project Report is a written record of your entire project from start to finish. The report should be detailed enough so that someone unfamiliar with the topic to understand exactly what you did, how you did it, whether or not the experimental results support your hypothesis and where you found your research.

Much of the report will be copied from your journal. So therefore if you have kept accurate and detailed notes in your journal, your report should be a breeze.

How to Organize your Project Report

Your report should include the following parts:

- Title Page
- Table of Contents
- Abstract
- Introduction
- Experiments, Research and Data
- Conclusion
- Sources

Title Page

Your title page should include the title of your project and your name. Avoid cluttering the title page with lots of clip art and drawings, these will often take away from the title page.

Your title should be short and concise, accurately describing the question you are trying to solve.

Table of Contents

The second page of your report should be the table of contents. It is a list of all the sections in your report as listed above. An example is provided.

Contents

Abstract

The abstract is a brief overview of the project. **It should be no more than one page.** It includes the following:

- project title
- statement of the purpose (question you wish to solve)
- hypothesis
- brief description of the procedure
- the results

Have extra copies of the abstract to give to officials. This will give them something to refer to when making their final decisions, often giving you the edge.

Introduction

The introduction is a statement of your purpose, along with background information that led you to make this study. It should contain a brief statement of your hypothesis based upon your research. This information will be found in your journal in the sections **Topic Research, Topic Questions, and Hypothesis.** Make references to information and experiences that led you to choose the project's purpose.

Use endnotes for each information source you have used.
In your sources section, each source will be listed (in alphabetical order) and numbered. When you use information that you found from a particular source, put that source's number at the end of the sentence.

Experiments, Research and Data

In this section you include the following:

- Question
- Hypothesis
- Materials
- Procedure
- Observations
- Interpretations

Include graphs, charts, tables and all the data included from these sections of your journal

Conclusion

The conclusion summarizes in one page or less, what you discovered based on your experimental results.

The conclusion restates the hypothesis and indicates whether or not the data supported it. The conclusion can also include a brief description of plans for exploring ideas for future experiments.

Sources

Sources are the places where you obtained information, including all of the written, computer, or experts that you consulted.

List the sources in alphabetical order and number them. These numbers will be used in your report whenever you refer to information that is not your own, which you found in a source.

Display

The display represents all your work in a visual manner.

Your display should include the following:

- Title
- Question or Problem
- Hypothesis
- Materials
- Procedure
- Observations and Interpretations
- Conclusion

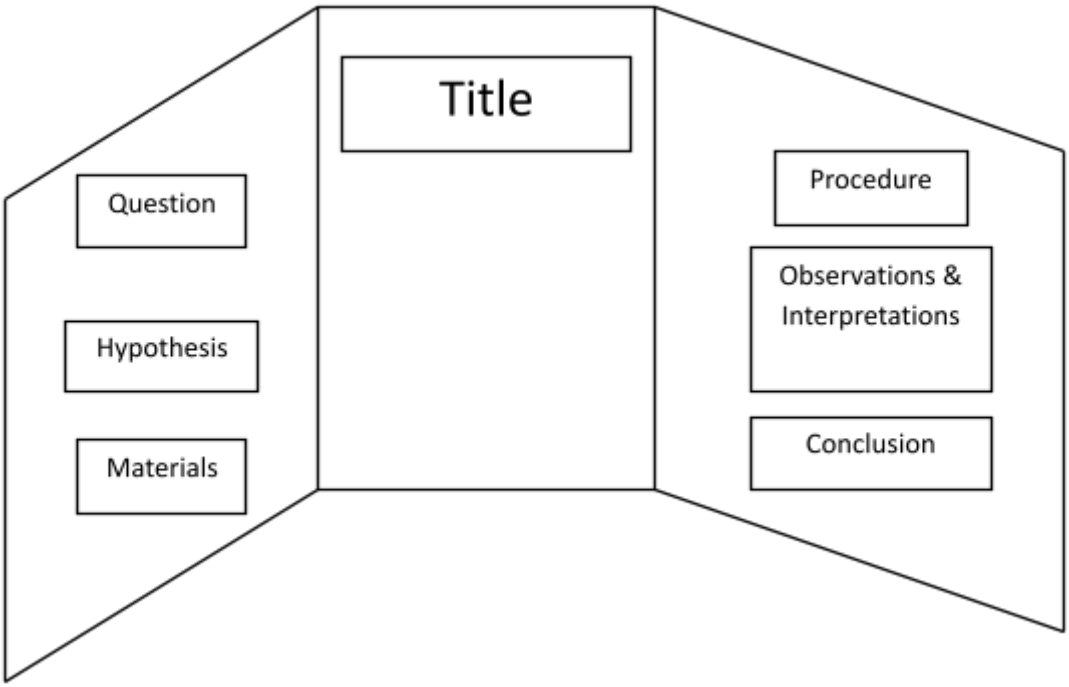
These different sections should be put in a logical order and arrangement so that it flows from one to the next.

For example, the observations and interpretations should be in the middle part of your board. On the left place the question, hypothesis, materials and procedure. On the right place the Conclusion.

In front of your board you can have a model of or apparatus that was used in the experiment, your project report, the abstract and your journal.

Helpful Hints

1. Use a table cloth to cover the table. This will help to distinguish your project from the ones on either side of you.
2. Place all typed material on a colored background, such as construction paper. Leave a border around the edges of each piece of paper and use a paper cutter, not scissors.
3. Make the project title stand out by using large bold letters. Use smaller letters of the same font for the headings.
4. To arrange the letters use a meter stick and pencil to draw lines. Place the letters on and arrange them. Stand back and look, get second opinions. Once you are satisfied with the arrangements, glue them in place.
5. Bring an emergency kit with extra letters, glue, tape, construction paper, stapler, scissors, pencils, pens, markers. This kit should contain anything that you think you might need to make last minute repairs to the display.



Do's and Don'ts

Do use computer generated graphs, reports, titles and headings

Do display photos representing the procedure and the results

Do limit the colors used

Do attach charts neatly

Do balance the arrangements of materials

Do use rubber cement or glue.

Don't leave large empty spaces

Don't leave the table in front of the display empty

Don't handprint letters on the backboard

Don't make spelling mistakes

The Presentation

The Presentation and Display
All projects will be evaluated using the Division Evaluation form. The top three projects in each grade will be invited to attend the Division Science Fair.

If you have followed the steps and hints in this handout, your science fair project will be very good.

Judging Information
Refer to the evaluation forms attached to this document. Use it as a checklist to make sure you have covered all the bases.

Have friends or family do a practice evaluation of your project.

Do's and Don'ts
Do bring activities, like books or puzzles. You may have to wait by your booth for some time.

Do be courteous and friendly to fellow competitors

Do have fun

Don't laugh or talk loud. This may affect the person near you that is being judged.

Don't forget that you are representing your school; its students, staff, and parents.

Appendix

Science Fair Brainstorming Sheet

Use this page to help you brainstorm ideas for your project. Later, you will include it in your log book.

Possible topics for my project:

1._____

_____

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: _____

_____

Final Topic Choice: _____

Question/problems to explore:

Some questions about my topic I am interested in and would want to find answers to: _____

Science Fair Plan sheet #1

Due: _____

Student Name(s): _____

1. Question: _____

2. Hypothesis: _____

3. Materials: _____

4. Variables:

    Independent variable: _____

    Dependent Variable: _____

    Controlled Variable: _____

5. Design

6. Procedures (point form in a list)

-
-
-
-
-

7. Observations: if you have already begun your trials and have started collecting data attach or include samples f he data you have collected. Are you noticing any patterns hat is your data telling you?

8. Conclusion: answer the question you asked originally was you hypothesis correct? Why/Why not? What did you notice instead? Any errors in your procedure?

Science Fair Plan Sheet #2

Due: _____

Student Name(s): _____

1. Question: _____

2. Hypothesis: _____

3. Materials: _____

4. Variables:

    Independent variable: _____

    Dependent Variable: _____

    Controlled Variable: _____

5. Design

6. Procedures (point form in a list)

-
-
-
-
-

7. Observations: if you have already begun your trials and have started collecting data attach or include samples f he data you have collected. Are you noticing any patterns hat is your data telling you?

8. Conclusion: answer the question you asked originally was you hypothesis correct? Why/Why not? What did you notice instead? Any errors in your procedure?

Science Fair Plan Sheet #3

Due: _____

Student Name(s): _____

1. Question: _____

2. Hypothesis: _____

3. Materials: _____

4. Variables:

    Independent variable: _____

    Dependent Variable: _____

    Controlled Variable: _____

5. Design

6. Procedures (point form in a list)

-
-
-
-
-

7. Observations: if you have already begun your trials and have started collecting data attach or include samples f he data you have collected. Are you noticing any patterns hat is your data telling you?

8. Conclusion: answer the question you asked originally was you hypothesis correct? Why/Why not? What did you notice instead? Any errors in your procedure?

CONDUCTING RESEARCH

Printed and audio-visual materials I should find and read:

_____

Places I could visit:

_____

_____

People I could talk to:

_____

_____

Supplies/equipment I need to acquire:

_____

_____

LOG BOOK

Diary OF DAILY WORK – RUNNING JOURNAL

DATE	*DESCRIBE WHAT YOU DID TOWARDS SCIENCE FAIR*

Judging Forms

Each project will be judged twice (a third time for a tie break or large point spread), using the rubrics below:

Fort Vermilion School Division 52	**Experiment 1-3**	PROJECT #: _____ ENTRANT(S): _____ PROJECT TITLE: _____
Experiment: An investigation undertaken to test a specific hypothesis.	**TOTAL MARK**	

Scientific Thought: (Log book, diary & backboard)				
Purpose (clearly stated)	5	3	2	1
Organization of experiment	5	3	2	1
Variables are recognized & controlled	5	3	2	1
Data is recorded & summarized	5	3	2	1
Valid conclusion (stated clearly)	5	3	2	1
Originality of Topic:				
Original approach to topic	6	4	2	1
Procedures are original & correct	6	4	2	1
Degree of difficulty	6	4	2	1
Presentation:				
Student shows excellent ability to Communicate & understand topic	20	15	10	5
Thoroughness:				
Project is dealt with in depth	15	10	5	3
Exhibit:				
Material used is appropriate	11	8	5	3
Dramatic Value:				
Eye Catching	11	8	5	3

Fort Vermilion School Division 52	**Experiment 4-12**	PROJECT #: _____ ENTRANT(S): _____ PROJECT TITLE: _____
Experiment: An investigation undertaken to test a specific hypothesis.	**TOTAL MARK**	

	Originality	**Circle one**		**Oral Presentation**	**Circle one**
Poor	Known procedure- results predictable (could find the procedure or outcome in a basic text)	4	Poor	Poorly organized and not clear	1
Fair	Know procedure with modification (basic idea but not outcome could be found in basic text, e.g. product testing)	7	Good	Organized and clear	3
Good	Some original aspect (for school level –not found in basic text but could be found in literature); some scientific contribution	10	Excellent	Well organized, clear and enthusiastic	4
Excellent	Significant original aspect (result could not be found easily in literature); significant scientific contribution	13			
	Analysis			**Depth of Understanding**	
Poor	Raw data – no analysis	0	Poor	Poor response to relevant background questions	0
Fair	Minimal data analysis	4	Fair	Fair responses to relevant background questions	4
Good	Simple analysis (average, graphs, tables)	8	Good	Good response to relevant background questions	6
Excellent	Detailed analysis (averages, graphs, tables, statistics)	13	Excellent	Excellent response to relevant background questions	13
	Variables			**Complexity**	
Poor	Some significant variables not controlled	0	Poor	Very simple, considering only one aspect of a problem	4
Fair	Some variables not controlled	4	Fair	More complex, considering at least two aspects of a problem	7
Good	Most variables controlled	8	Good	Considering at least three aspects of a problem	10
Excellent	All possible variables controlled	13	Excellent	Quite complex considering four or more aspects of a problem	13
	Sample size			**Project Summary**	
Poor	Inadequate to address problem	0	Poor	Poorly organized, confusing	2
Fair	Barely adequate to address problem	4	Good	Organized, understandable	5
Good	Adequate to address problem	8	Excellent	Well organized, clear, good grammar and spelling	8
Excellent	Quite adequate to address problem	13			
	Log Book, Notes or Printouts			**Backboard**	
Poor	None	0	Poor	Hard to read and understand	1
Fair	Barely adequate	2			
Good	Adequate	4	Good	Easy to read and understand	4
Excellent	Quite adequate	6			

Fort Vermilion School Division 52	**Research 1-3**	PROJECT #: _____ ENTRANT(S): _____ PROJECT TITLE: _____
Research: literature-based or personal study on a topic	**TOTAL MARK**	

Scientific Thought: (Log book, diary & backboard)					Physical Exhibit:				
Information has variety	5	3	2	1	Display is neat & well organized	10	7	5	3
Information has depth	5	3	2	1	Display is complete in explaining the project	10	7	5	3
Information has accuracy	5	3	2	1					
Information is summarized and ties in with purpose	5	3	2	1					

Interview:				
Questions answered with clarity & enthusiasm	10	7	5	3
The student answered the questions through demonstration & understanding of the project	10	7	5	3

Written Report:				
Complete & Accurate log book	7	5	3	1
Complete & Accurate summary	7	5	3	1
Variety of references	6	5	3	1

Creative Ability:				
Represents a product of student's own skill	10	7	5	3
Student's awareness of project has or can have on society	10	7	5	3

Fort Vermilion School Division 52	**STUDY 4-12**	PROJECT #: _____ ENTRANT(S): _____ PROJECT TITLE: _____
STUDY: literature-based or personal study on a topic	**TOTAL MARK**	

	Originality	**Circle one**		**Oral Presentation**	**Circle one**
Poor	Study basic – general knowledge	4	Poor	Poorly organized and not clear	1
Fair	Study basic but with modifications	7			
Good	Study original at school level but could be found in scientific literature; some scientific contribution	10	Good	Organized and clear	3
Excellent	Study has significant original aspect; significant scientific contribution	13	Excellent	Well organized, clear and enthusiastic	4
	Analysis			**Depth of Understanding**	
Poor	No analysis or information	0	Poor	Poor response to relevant background questions	0
Fair	Minimal data analysis **OR** minimal comparison with literature	4			
Good	Simple analysis of data (average, graphs, tables) **OR** comparison with various sources of information	8	Fair	Fair responses to relevant background questions	4
			Good	Good response to relevant background questions	6
Excellent	Detailed analysis of data (averages, graphs, tables, statistics) **OR** comparison with multiple sources of information	13	Excellent	Excellent response to relevant background questions	13
	Literature or Personal Research			**Complexity**	
Poor	School texts only and little data collected	0	Poor	Very simple, considering only one aspect of a problem	4
Fair	Texts and other school sources or fair data collected	4	Fair	More complex, considering at least two aspects of a problem	7
Good	Scientific publications or good data collection	8	Good	Considering at least three aspects of a problem	10
Excellent	A variety of significant scientific sources or excellent data collection	13	Excellent	Quite complex considering four or more aspects of a problem	13
	Synthesis or Connections			**Project Summary**	
Poor	Little or no attempt to draw conclusions or extend the ideas of others / Little or no attempt to make connections with related scientific work	0	Poor	Poorly organized, confusing	2
			Good	Organized, understandable	5
Fair	Some attempt to draw conclusions or extend the ideas of others / Some attempt to make connections with related scientific work	4	Excellent	Well organized, clear, good grammar and spelling	8
Good	Good attempt to draw conclusions or extend the ideas of others / Good attempt to make connections with related scientific work	8			
Excellent	Excellent conclusions or extensions / Excellent attempt to make connections with related scientific work	13			
	Log Book, Notes or Printouts			**Backboard**	
Poor	None	0	Poor	Hard to read and understand	1
Fair	Barely adequate	2			
Good	Adequate	4	Good	Easy to read and understand	4
Excellent	Quite adequate	6			

Fort Vermilion School Division 52	**Innovation 4-12**	PROJECT #: _____ ENTRANT(S): _____ PROJECT TITLE: _____
Innovation: Student builds something, e.g. computer program, tools, machine, procedure, process, etc.	**TOTAL MARK**	

	Originality	**Circle one**
Poor	Innovation described in basic school books	4
Fair	Making improvements or new applications for innovations described in basic school books	7
Good	Innovations with some original aspect but have been made before	10
Excellent	Innovations having a significant original aspect	13

	Oral Presentation	**Circle one**
Poor	Poorly organized and not clear	1
Good	Organized and clear	3
Excellent	Well organized, clear and enthusiastic	4

	Design Procedures	
Poor	Neither calculations not planning prior to construction	0
Fair	Some calculations or planning prior to construction	4
Good	Adequate calculations or planning prior to construction	8
Excellent	Extensive calculations or planning prior to construction	13

	Depth of Understanding	
Poor	Poor response to relevant background questions	0
Fair	Fair responses to relevant background questions	4
Good	Good response to relevant background questions	6
Excellent	Excellent response to relevant background questions	13

	Degree of Success and/or Quality of Construction	
Poor	Not successful	0
		4
Fair	Successful in some aspects	8
		13
Good	Successful in many aspects	
Excellent	Very successful	

	Backboard	
Poor	Hard to read and understand	1
Good	Easy to read and understand	4

	Justification	
Poor	No possible economic or social benefit for innovation	3
Fair	Possible economic or social benefit for innovation	6
Good	Good potential for economic or social benefit for innovation	10
Excellent	Excellent potential for economic or social benefit for innovation	14

	Project Summary	
Poor	Poorly organized, confusing	2
Good	Organized, understandable	5
Excellent	Well organized, clear, good grammar and spelling	8

	Log Book, Notes or Printouts	
Poor	None	0
Fair	Barely adequate	2
Good	Adequate	4
Excellent	Quite adequate	6