



The Science Fair Opportunity

If you are reading this Judges Training handout, you have either volunteered as a judge or you have picked up this handout to read. If you are a Judge, thank you for your interest and commitment to the youth of tomorrow. If you picked up this handout out of interest I would encourage you to see the Science Fair web site at <http://www.lambtoncountysciencefair.ca>

As a science fair judge, you will be provided with a number of opportunities for the small amount of time that you will invest in judging. Also you will gain personal rewards from the experience and interaction with the students that can be found by any other experience.

Judges Benefits

- ◆ Excellent Opportunity to Network
- ◆ Develop Communication Skills
- ◆ Develop Analytical and Evaluation skills (Translates into leadership and management skill base)
- ◆ Sharpen your Investigative Skills
- ◆ Build Self Confidence
- ◆ Share Knowledge with Today's Youth
- ◆ Have fun while helping others

Judges are an integral part of a science fair. As a judge you are part of the science fair infrastructure. Your time as a judge has impact that goes far beyond the day of judging, your time reaches out and influences students, schools, the community, businesses and science fairs.

Students Benefits

- ◆ Learn more about Science
- ◆ Are presented with a challenge
- ◆ Earn Recognition and win acceptance
- ◆ Gain Pleasure from achievement
- ◆ Build Self Esteem and Self Confidence
- ◆ Meet members of the Business Community
- ◆ Meet members of the Scientific Community

School Benefits

Science fairs create an event for schools to use to raise interest in education. Schools also gain in having better students through their experience of science fair competition and interaction with the judges.

Community Benefits

The community gets the long-term benefits of the leadership development of our children who participate in science fairs.

Business Benefits

Science fairs are a medium that can be used to promote businesses through raising community awareness of the businesses that support science fairs. Businesses also reap rewards from the communication and leadership skills that their volunteer judges gain through participating in the science fairs.

Science Fair Benefits

The Science Fair gains exposure to businesses and schools. Science Fairs, a network of volunteer organizations, are sponsored by community and business donations. Well run science fairs build fair credibility and solidarity of all of the fair supporters.

The Roles of a Judge

The Judging role is multi faceted. Judging is more than putting scores on paper. As a judge you will step into a number of roles through the judging day. Fulfilling all of these roles is important for having a successful science fair. You may not fill all of these roles as a judge when interviewing a student, but through the day you will have the opportunity to exercise all of the roles.

Evaluator

The main role of a Judge is to evaluate the various projects and assign them a score. This is usually done before the students arrive in the morning. You will be evaluating the project on the basis of what you see. Quality of work and presentation fit into this function as a judge.

Facilitator

In the afternoon, you get to meet the students. You will still be evaluating the project, but you will also be a Facilitator, creating an open and positive atmosphere to allow the student to comfortably tell you about their project and the research that they did. This role is important because quality of your facilitation will result in amount of information you will receive to make an accurate evaluation of the project as a whole.

Counselor

When a student asks you, "What could I have done better in this project?", you have then stepped into the role of a counselor. You can make a recommendation of what could have taken the project up to the next level of quality. If the Student does not ask how they could have improved their project, then it is your responsibility to give the student one growth point for improvement on the project. (no more – no less).

Motivator

An important role of a judge is to give the student some compliments that will make them feel good about their work and motivate them to compete again. The students have put in a lot of work to compete in the fair and should be complimented on that as well as the work that they have done. The simplest compliment given to a student can spur them on to future success in life.

Role Model

Remember that when communicating with the students, you are in the role of the judge, a leader in the community, from business or academia. Your actions portray to the students what the science fair is all about. Take care in what you do and say in the presence of the students.

Provide a good experience for the Competitors

As a judge you can provide a good experience for the student competitors by using the following items:

- ◆ Be Genuine
- ◆ Let the contestants show their stuff
- ◆ Encourage conversation
- ◆ Avoid value judgements
- ◆ Give one opportunity for improvement
- ◆ Recognize 3 Project Strengths
- ◆ End meeting on a positive note
- ◆ Smile

Judge Behaviour with Students

When with the students, there are things that you can do to make the experience a learning experience for the students and an enjoyable experience for you:

- ◆ Show you are interested
- ◆ Listen actively
- ◆ Give positive reinforcement to nourish self esteem (say what you like about project)
- ◆ Work to put students at ease, (Sit Down)
- ◆ If students are intimidated they will not speak freely
- ◆ Ask students about their Projects, not just what they did
- ◆ Ask students enough questions to satisfy yourself that they understood the project.
- ◆ When you have reached the student's knowledge limit. STOP asking questions
- ◆ Have 1 Positive Comment for every student
- ◆ Remember when you were 12 years old
- ◆ Let the student teach you something

Sample Questions

These are some good sample questions that will spur on conversations during the judging process.

- ◆ Why did you decide to study this topic?
- ◆ What are your controlled variables?
- ◆ How accurate are your readings?
- ◆ What future applications can you see from the results of this project?
- ◆ What one outstanding thing did you learn doing this project?
- ◆ How would you improve this project if you would do it again?

Suggested Wording

Personalize your language

- I liked....
- I enjoyed....
- I feel that.....
- I see that.....

If asked

- 'I suggest...
- A technique I have used.....
- The project would have more impact on me if....

What to Expect on Judging Day

- 4:30 Chief Judge will arrive at fair and set up room A223
- 5:30 General Welcome and Introduction
- 6:00 Judging projects with students begins
- 7:00 10 minute break for students – Use this time to look at presentations independent of students
- 8:30 10 minute break for students – Use this time to look at presentations independent of students
- 9:30 Judges Meet with other judges for level/category to determine level and category winners
Submit winners in level/category to chief judge
- 10:00 Chief Judge and Awards Committee meeting. Volunteers Judges Work is Completed.

Judging Tips and Tricks

- ◆ Get there early
- ◆ Set timing goals for your exhibits (10-15 min per project)
- ◆ Contestants understanding is as important as the project
- ◆ Every Project should receive a passing Mark
- ◆ Revise your scores as many times as you need
- ◆ Don't tally judging sheet in front of Contestants
- ◆ Judging is finished around 9:30
 - ◆ Be prepared to stay until 9:30 or 10:00

How to Judge a Project

Before starting to judge take a quick walk-around of all of your assigned projects, to get a feel for what they are about, what they look like, and where they are located.

- Read through the backboard in some logical order; assess it's impact, and how well it tells the "story" of the project. Were you able to understand quickly what the project is trying to do, and what the results were?
 - If equipment or devices are part of the display, do they serve an obvious purpose, based on what you have seen so far?
 - Read through the abstract. Assess it. (If missing, ask for it in interview.)
 - Read through the workbook (journal and/or full report). Assess it. (If missing, ask for it in interview.)
 - Write down your questions and compliments, for use in the Interview, and add to comments section of the judging form.
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- Note your marks.
 - Remember not to "team-judge", but be sure to ask the Chief Judge or another experienced judge if you have any questions during judging.
 - Once all projects are marked and interviewed:
 - 1) Write down the rank order of the projects you have judged, based on your overall impressions of the day.
 - 2) Which one is best?
 - 3) Which should be at the bottom of the list?
 - 4) Now check the total mark you have assigned to each project.
 - 5) Is your impression consistent with the marks you've assigned? Decide if you need to review anything.
 - Meet with the other judges who judged the same level and category of projects as you did. Compare the relative rankings of the projects as decided by all the judges. Every judge should have judged at least one of the same projects as every other judge. After comparing the relative rankings, the top several projects will likely stand out. At this point, if there are questions about which projects are the top in the level/category, it may be necessary to have a collection of the judges revisit the top projects in question for the final rankings.



Using the Judging Form

As a judge the main tools that you will use are a pencil, a clipboard, and judging forms. All tools are supplied on the judging day. To use the judging form effectively, follow the steps on the following pages. It is just that easy.

Typical Judging Form

Page 1

Judging Criteria for Scientific Thought	PART A: SCIENTIFIC THOUGHT (MAX 40 POINTS)			PART A SCORE
	EXPERIMENT	STUDY	INNOVATION	
1) Clear Objective 2) Effective Approach 3) Proper recognition and manipulation of variables and/or use of controls. 4) Recognition and treatment of experimental errors. 5) Adequate supporting data 6) Clearly stated conclusions. 7) Reliable sources of information 8) Awareness of what further research is required	Definition An investigation undertaken to test a specific hypothesis using experiments	Definition A collection and analysis of data to reveal evidence of a fact or a situation or a pattern of scientific interest. This could include a study of cause and effect relationships or theoretical investigations of scientific data. Variables, if identified, are by their nature not feasible to control., but an effort to make meaningful correlation is encouraged	Definition A project involving the development and evaluation of innovative devices, models, techniques or approaches in fields such as technology, engineering, or computers (both hardware or software)	
Judges Comments	LEVEL I – (Acceptable) Duplication of a known experiment to confirm the hypothesis. Hypothesis is totally predictable. (Max 10 pts)	LEVEL I – (Acceptable) Study of existing printed material related to the basic issue. (Max 10 pts)	LEVEL I – (Acceptable) Building models (devices) to duplicate existing technology. (Max 10pts)	1 2 3 4 5 6 7 8 9 10
	LEVEL II – (Fair) Extend a known experiment through modification of procedures , data gathering and application (Max 20 pts)	LEVEL II – (Fair) Study of material collected through compilation of existing data and through personal observations. Display attempts to address a specific issue. (Max 20pts)	LEVEL II – (Fair) Makes improvements to, or demonstrates new applications for existing technological system(s) or equipment and is able to justify them. (Max 20 pts)	11 12 13 14 15 16 17 18 19 20
	LEVEL III – (Good) Devise and carry out an original experiment with controls. Variables are identified. Some significant variables are controlled. (Max 30 pts)	LEVEL III – (Good) Study based on observations and literary research illustrating various options for dealing with a relevant issue. Should include some statistical analysis of data. (Max 30 pts)	LEVEL III – (Good) Designs and build innovative technology or provides adaptations to existing technology that will have economic applications and/or human benefit. (Max 30 pts)	21 22 23 24 25 26 27 28 29 30
	LEVEL IV – (Excellent) Devise and carry out an original experimental research which attempts to control or investigate most significant variables. (Max 40 pts)	LEVEL IV – (Excellent) Study correlating information from a variety of significant sources which may illustrate cause and effect or original solutions to current problems through synthesis. Should include in-depth statistical analysis of data. (Max 40 pts)	LEVEL IV – (Excellent) Integrates several technologies, inventions or designs and constructs an innovative technological system that will have commercial and/or human benefits. (Max 40 pts)	31 32 33 34 35 36 37 38 39 40

Page 2

PART B: UNDERSTANDING AND PRESENTATION (MAX 24 POINTS)				TITLE	NAME	SCHOOL	JUDGES SUMMARY	PART A: SCIENTIFIC THOUGHT (Max 40 pts)	PART B: ORAL PRESENTATION (Max 24 pts)	PART C: ORIGINALITY (Max 16 pts)	PART D: DISPLAY (Max 20 pts)	TOTAL SCORE (A+B+C+D)	Judges Signature _____ Judges comments _____ _____ _____								
Presentation Logic, poise, confidence, fluency, enthusiasm		Understanding enthusiasm												Exhibit #	Judges Score						
Level I (Max 8)	Student is unsure of the material or the process of the project and has difficulty answering questions about the project	1	2											3	4	5	6	7	8		
Level II (Max 16)	Student can summarize the project adequately and can answer the majority of questions about the project	9	10											11	12	13	14	15	16	Age Class	Project Category
Level III (Max 24)	Student explains the project well and can answer all questions about the project clearly and logically.	17	18	19	20	21	22	23	24	JUDGING BOOKLET											
PART C: ORIGINALITY (MAX 16 PTS)				Topic Originality		1	2	3	4	Lambton County Science Fair											
Originality of approach		1	2	3	4	Resourceful use of material, Information, equipment		1	2	3	4										
Creative interpretation of data		1	2	3	4	PART D: DISPLAY (MAX 20 POINTS)		Layout logical and self-explanatory.		1	2	3	4								
PART D: DISPLAY (MAX 20 POINTS)		Concise presentation.		1	2	3	4	Neatness		1	2	3	4								
Appropriate and effective use of materials		1	2	3	4	Dramatic value		1	2	3	4										

Sample of Form Usage

Page 1. Step 1 – Choose a Definition

Level	EXPERIMENT	STUDY	INNOVATION	PART A SCORE
LEVEL I – (Acceptable)				1 2 3 4 5 6 7 8 9 10
LEVEL II – (Fair)				11 12 13 14 15 16 17 18 19 20
LEVEL III – (Good)				21 22 23 24 25 26 27 28 29 30
LEVEL IV – (Excellent)				31 32 33 34 35 36 37 38 39 40

PART A: SCIENTIFIC THOUGHT (MAX 40 POINTS)			PART A SCORE
EXPERIMENT	STUDY	INNOVATION	
Definition	Definition	Definition	
An investigation undertaken to test a specific hypothesis using experiments	A collection and analysis of data to reveal evidence of a fact or a situation or a pattern of scientific interest. This could include a study of cause and effect relationships or theoretical investigations of scientific data. Variables, if identified, are by their nature not feasible to control, but an effort to make meaningful correlation is encouraged	A project involving the development and evaluation of innovative devices, models, techniques or approaches in fields such as technology, engineering, or computers (both hardware or software)	
LEVEL I – (Acceptable) Duplication of a known experiment to confirm the hypothesis. Hypothesis is totally predictable. (Max 10 pts)	LEVEL I – (Acceptable) Study of existing printed material related to the basic issue. (Max 10 pts)	LEVEL I – (Acceptable) Building models (devices) to duplicate existing technology. (Max 10pts)	1 2 3 4 5 6 7 8 9 10
LEVEL II – (Fair) Extend a known experiment through modification of procedures, data gathering and application (Max 20 pts)	LEVEL II – (Fair) Study of material collected through compilation of existing data and through personal observations. Display attempts to address a specific issue. (Max 20pts)	LEVEL II – (Fair) Makes improvements to, or demonstrates new applications for existing technological system(s) or equipment and is able to justify them. (Max 20 pts)	11 12 13 14 15 16 17 18 19 20
LEVEL III – (Good) Devise and carry out an original experiment with controls. Variables are identified. Some significant variables are controlled. (Max 30 pts)	LEVEL III – (Good) Study based on observations and literary research illustrating various options for dealing with a relevant issue. Should include some statistical analysis of data. (Max 30 pts)	LEVEL III – (Good) Designs and build innovative technology or provides adaptations to existing technology that will have economic applications and/or human benefit. (Max 30 pts)	21 22 23 24 25 26 27 28 29 30
LEVEL IV – (Excellent) Devise and carry out an original experimental research which attempts to control or investigate most significant variables. (Max 40 pts)	LEVEL IV – (Excellent) Study correlating information from a variety of significant sources which may illustrate cause and effect or original solutions to current problems through synthesis. Should include in-depth statistical analysis of data. (Max 40 pts)	LEVEL IV – (Excellent) Integrates several technologies, inventions or designs and constructs an innovative technological system that will have commercial and/or human benefits. (Max 40 pts)	31 32 33 34 35 36 37 38 39 40

Page 1. Step 2 – Choose a Level

Level	EXPERIMENT	STUDY	INNOVATION	PART A SCORE
LEVEL I – (Acceptable)				1 2 3 4 5 6 7 8 9 10
LEVEL II – (Fair)				11 12 13 14 15 16 17 18 19 20
LEVEL III – (Good)				21 22 23 24 25 26 27 28 29 30
LEVEL IV – (Excellent)				31 32 33 34 35 36 37 38 39 40

PART A: SCIENTIFIC THOUGHT (MAX 40 POINTS)			PART A SCORE
EXPERIMENT	STUDY	INNOVATION	
Definition	Definition	Definition	
An investigation undertaken to test a specific hypothesis using experiments	A collection and analysis of data to reveal evidence of a fact or a situation or a pattern of scientific interest. This could include a study of cause and effect relationships or theoretical investigations of scientific data. Variables, if identified, are by their nature not feasible to control, but an effort to make meaningful correlation is encouraged	A project involving the development and evaluation of innovative devices, models, techniques or approaches in fields such as technology, engineering, or computers (both hardware or software)	
LEVEL I – (Acceptable) Duplication of a known experiment to confirm the hypothesis. Hypothesis is totally predictable. (Max 10 pts)		LEVEL I – (Acceptable) Building models (devices) to duplicate existing technology. (Max 10pts)	1 2 3 4 5 6 7 8 9 10
LEVEL II – (Fair) Extend a known experiment through modification of procedures, data gathering and application (Max 20 pts)		LEVEL II – (Fair) Makes improvements to, or demonstrates new applications for existing technological system(s) or equipment and is able to justify them. (Max 20 pts)	11 12 13 14 15 16 17 18 19 20
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Page 1. Step 3 – Choose the Appropriate Score for the definition and level chosen. Transfer score to Section A score box on Page 2

PART A: SCIENTIFIC THOUGHT (MAX 40 POINTS)			
	STUDY	INNOVATION	PART A SCORE
	Definition	Definition	
	A collection and analysis of data to reveal evidence of a fact or a situation or a pattern of scientific interest. This could include a study of cause and effect relationships or theoretical investigations of scientific data. Variables, if identified, are by their nature not feasible to control, but an effort to make meaningful correlation is encouraged.	A project involving the development and evaluation of innovative devices, models, techniques or approaches in fields such as technology, engineering, or computers (both hardware or software)	
LEVEL I – (Acceptable) Duplication of a known experiment to confirm the hypothesis. Hypothesis is totally predictable. (Max 10 pts)	LEVEL I – (Acceptable) Study of existing printed material related to the basic issue. (Max 10 pts)	LEVEL I – (Acceptable) Building models (devices) to duplicate existing technology. (Max 10pts)	1 2 3 4 5 6 7 8 9 10
LEVEL II – (Fair) Extend a known experiment through modification of procedures, data gathering and application. (Max 20 pts)	LEVEL II – (Fair) Study of material collected through compilation of existing data and through personal observations. Display attempts to address a specific issue. (Max 20pts)	LEVEL II – (Fair) Makes improvements to, or demonstrates new applications for existing technological system(s) or equipment and is able to justify them. (Max 20 pts)	11 12 13 14 15 16 17 18 19 20
	LEVEL III – (Good) Study based on original research illustrating various options for dealing with a relevant issue. Should include some statistical analysis of data. (Max 30 pts)	LEVEL III – (Good) Develops innovative technology or provides solutions to existing technology that will have economic applications and/or human benefit. (Max 30 pts)	○
LEVEL IV – (Excellent) Devise and carry out an original experimental research which attempts to control or investigate most significant variables. (Max 40 pts)	LEVEL IV – (Excellent) Study correlating information from a variety of significant sources which may illustrate cause and effect or original solutions to current problems through synthesis. Should include in-depth statistical analysis of data. (Max 40 pts)	LEVEL IV – (Excellent) Integrates several technologies, inventions or designs and constructs an innovative technological system that will have commercial and/or human benefits. (Max 40 pts)	31 32 33 34 35 36 37 38 39 40

Page 2. Step 4 – Select Level of Understanding and Presentation and Choose Appropriate Score. Transfer score to Section B score box on Page 2

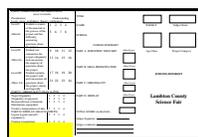
PART B: UNDERSTANDING AND PRESENTATION (MAX 24 POINTS)			
Presentation Logic, poise, confidence, fluency, enthusiasm		Understanding enthusiasm	
Level I (Max 8)	Student is unsure of the material or the process of the project and has difficulty answering questions about	1 2 3 4 5 6 7 8	
Level III (Max 24)	Student explains the project well and can answer all questions about the project clearly and logically.	17 18 19 20 21 22 23 24	○

Page 2. Step 5 – Choose Appropriate Score for the Originality Section. Transfer sum of the scores to Section C score box on Page 2



PART C: ORIGINALITY (MAX 16 PTS)				
Topic Originality	1	2	3	4
Originality of approach	1	2	3	4
Resourceful use of material, Information, equipment	1	2	3	4
Creative interpretation of data	1	2	3	4

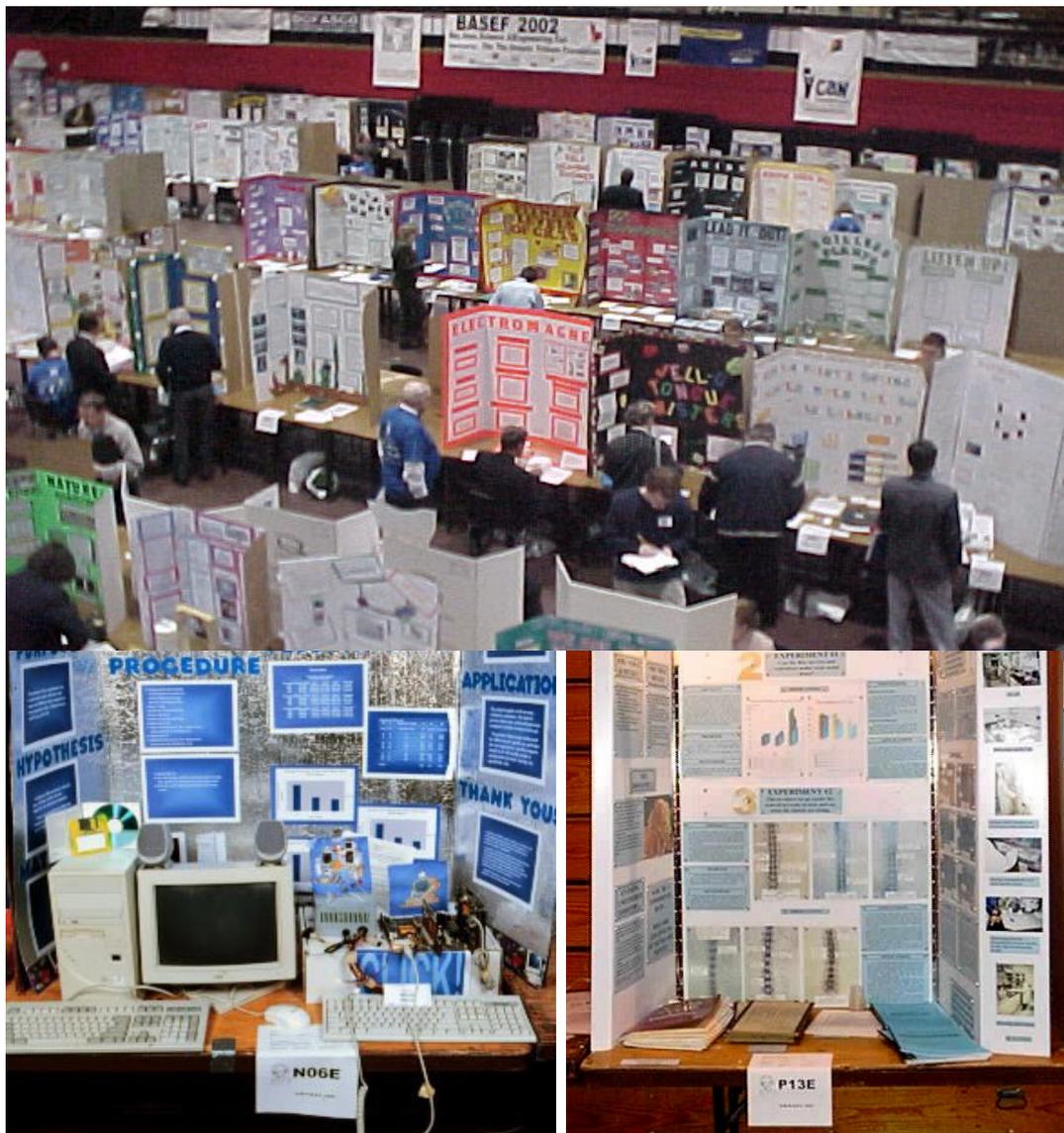
Page 2. Step 6 – Choose Appropriate Score for the Display Section. Transfer sum of the scores to Section D score box on Page 2



PART D: DISPLAY (MAX 20 POINTS)				
Layout logical and self-explanatory.	1	2	3	4
Concise presentation.	1	2	3	4
Neatness	1	2	3	4
Appropriate and effective use of materials	1	2	3	4
Dramatic value	1	2	3	4

Final Word

We at the LCSF would like to thank you for your participation as a volunteer judge. Your help will help to make this a successful fair.



Enjoy the Experience!