Judging Manual

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Chief-Judge ERSF 2023

Introduction

Thank you for agreeing to judge ERSF 2023!

This will be ERSF's 60th in person Fair or 63rd Fair including virtual fairs.

Goals of a Science Fair

The goal of a science fair is to engage youth in the research process at an early age through science inquiry and critical thinking. By engaging students with science when they are young, ERSF hopes to instill a life-long love of discovery and learning.

Divisions

There are five divisions at the Edmonton Regional Science Fair (ERSF): Grade 4, Grade 5, Grade 6, Junior (Grade 7 & 8) and Senior (Grade 9-12).

Awards of Excellence

The ERSF has implemented a system of Gold, Silver and Bronze awards in each division. This is adjusted each year to reflect the target of 25% earning awards.

Division	Gold	Silver	Bronze
Grade 4	3%	9%	12%
Grade 5	3%	9%	12%
Grade 6	3%	9%	12%
Junior	3%	9%	12%
Senior	3%	9%	12%

Each project will be judged five times for the Awards of Excellence. Eight students from the Junior and Senior Divisions will be attending the Canada Wide Science Fair to represent Edmonton.

Special Awards

Students self-nominate themselves for Special Awards when they register for the Science Fair. A complete list of Special Awards can be found at www.ersf.ca/Awards Judges who judge Special Awards will only be judging Special Awards.

Overview of the Judging Process

1. Each Excellence Judge & Special Awards Judge will be assigned the projects that they will be judging.
2. Round 1 9:00-12:00
3. Round 2 1:00-2:00 for Elementary students
4. Round 2 1:00-4:00 for grades 7-12
5. After each project is judged you should find a quiet spot to complete required paperwork. The first sheet of the judging form will NOT be returned to the student(s) but the second sheet will be returned to the student(s). When completing the feedback page be positive in your comments with your suggestions for improvement. In the Appendices is a list of words that may assist you in writing positive comments.
6. After completing all assigned judging, hand in all judging forms and materials to the DC.

7. The Division Coordinator will go out on the floor to finalize the Gold, Silver and Bronze medals allotted to each division. No interviews are needed to complete the final list of awards for each division.

QUALITIES OF A GOOD SCIENCE FAIR JUDGE

A judge for the Edmonton Regional Science Fair will have a memorable impact on the lives of some very talented young people. Judging involves direct contact with the students. For some, a judge is the first professional scientist or engineer they have encountered; thus, part of a judge's job at the Science Fair is to be an ambassador for his/her profession. It is a good idea when approaching a student for the judge to introduce himself and describe his background.

Remember: These are students who may be as young as nine years old and do not have the background or experiences of university level students.

Conveying Fairness
As a judge, it is very important to demonstrate to students that he/she is fair and knowledgeable.

- ✓ Spend approximately the same amount of time with each student.
- ✓ Listen carefully to the student's explanation of the project.
- ✓ The questions asked are intended to find out more about the project and how it was done, not to embarrass or intimidate the student

Asking Questions
The best tool in judging is the ability to ask questions and listen carefully to the answers. Ask questions that the student can answer, and continue a conversation for about ten to fifteen minutes.
Sample questions might include:

- How did you come up with the idea for this project?
- What did you learn from your background search?
- How long did it take you to build the apparatus?
- Did you have help in building this apparatus?
- How did you build the apparatus?
- How much time (days, weeks, months) did it take to run the experiments? (i.e., grow the plants, collect each data point, record observations, etc.?
- How many times did you run the experiment with each configuration?
- How many experiment runs are presented by each data point on the chart?
- Did you take all data (run the experiment) under the same conditions, e.g., at the same temperature, time of day, lighting conditions?
- How does your apparatus (equipment/instrument) work?
- What do you mean by: _____(terminology or jargon used by the student)?
- Do you think there is an application in industry for this knowledge (technique)?
- Were there any books/websites that helped you do your analysis (build your apparatus)?
- When did you start this project? Or, how much of the work did you do this year?
- (Some students bring last year's winning project back, with only a few enhancements.)
- What new questions did your results suggest?
- What is the next experiment to do in continuing this study?
- Are there any areas that we have not covered which you feel are important?
- Do you have any questions for the judges?

Note: These questions are only suggestions to keep the dialog going. You will find other questions to be more useful in specific interviews.

One type of question to avoid is: "Why didn't you do...?"

Probing questions are useful to stimulate the thought processes of the student.

However, a solution or extension to the work presented may be obvious to a judge with years of experience, but the student may not understand why such a question is asked. This question could be asked in a more positive manner as in: “Could you have done…?” or “What do you think would have happened if you had done…?” When phrased this way, the question is an invitation for the student to think about the experiment in a different way, and the question sets a positive, rather than a negative mood.

A Big Picture Question

At one time Google sponsored a global Science Fair. One of the questions for participants was “How does your project benefit society?”

Time Allotment

The interview for each project should take about 15 minutes with five minutes to fill out the judging sheet scores and write the comments.

Prior to Handing in Score Sheets

Please double check that all parts of the score sheet are completed and all the subtotals and totals are added correctly.

AI Text tools and STEM projects

a. encourage use of AI tools as a starting point, not to produce a final project text,
c. update judge training to encourage higher-order questions, and
d. AI is a product of STEM.

Mentorship

All professional scientists receive extensive mentoring.

The levels of mentoring are:

1. I did not receive any mentoring.
2. I exchanged a few emails or phone calls, and/or met with my mentor once or twice to discuss my ideas.
3. I had occasional contact with my mentor by email or phone, and/or met occasionally with my mentor who provided some advice or materials.
4. I had regular contact with my mentor by email or phone, and/or met regularly with my mentor who provided advice, materials, assistance with design/testing, or data analysis.
5. I had regular face-to-face contact with my mentor and regular access to advice, materials, space, equipment, design/testing, or other personnel in a specialized facility.
6. I worked closely with my mentor over an extended period of time to develop the project idea, plan and conduct the research/development, and analyze the results or test the innovation.
7. Does the student have a good grasp of the project, and did he/she do the work?

8. Do not discount a project just because it was mentored.

Types of Projects

Experiment	Innovation	Study
Undertake an investigation to test a scientific hypothesis by the experimental method. At least one independent variable is manipulated: other variables are controlled.	Develop and evaluate new devices, models, theorems, physical theories, techniques or methods in technology, engineering, computing, natural science, or social science.	Analysis of, and possibly collections of, data using accepted methodologies from the natural, social, biological, or health sciences. Includes studies involving human subjects, biology field studies, data mining, observation and pattern recognition in physical and/or socio-behavioural data

The ERSF's judging form (see below) reflects these three types of projects and there is no preference given to one type of project over another.

The scale is shown near the top right of the judging form on p.1.

The main sections are:

Scientific Method	45%
Creativity & Insight	25%
Communication	20%
Degree of Difficulty	10%

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EDMONTON REGIONAL SCIENCE FAIR

JUDGING RUBRIC – March 11, 2023

PROJECT # _____

Judge's Name: _____

_____

1. SCIENTIFIC METHOD (Chose only one category, 1A, 1B or 1C)

Judge the project in only one of the following categories:

Experimental (1A), Innovation (1B) or Study (1C)

If you have difficulty choosing a category Please contact the Division Coordinator

Please use the following scale:

5 Excellent
4 Good
3 Satisfactory
2 Weak
0 Not Present

1A. EXPERIMENTAL PROJECT – an investigation undertaken to test a scientific hypothesis using experimentation, usually featuring the identification and control of variables.

PROBLEM / HYPOTHESIS

1. Existing knowledge and background research were integrated into the formation of the problem/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

SUBTOTAL / 10 _____

METHOD

3. Experimental design was clearly described and appropriate for solving the problem 0 1 2 3 4 5
4. Controlled, manipulated and responding variables were identified and understood 0 1 2 3 4 5
5. Repetitions of tests and/or appropriate sample size were used to achieve reliable results 0 1 2 3 4 5
6. Logbook recorded progress of the project including detailed procedures, results and original data 0 1 2 3 4 5

SUBTOTAL / 20 _____

ANALYSIS / CONCLUSION

7. Appropriate methods were used to present and analyze data (e.g. graphs, charts and statistics) 0 1 2 3 4 5
8. Sources of errors and experimental limitations (e.g. the effect of variables that could not be controlled) were understood 0 1 2 3 4 5
9. Conclusions were related to the problem/hypothesis and were supported by the data presented 0 1 2 3 4 5

SUBTOTAL / 15

1B. INNOVATION PROJECT – the development and evaluation of innovative devices, models, or techniques in technology, engineering or computers.

PROBLEM / HYPOTHESIS

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

SUBTOTAL / 10

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/objective 0 1 2 3 4 5
5. The project design was appropriately tested 0 1 2 3 4 5
6. Logbook recorded progress of the project, including detailed procedures, results and modifications 0 1 2 3 4 5

SUBTOTAL / 20 _____

ANALYSIS / CONCLUSION

7. A connection was established between the problem/objective and results 0 1 2 3 4 5
8. Testing was carried out to modify the project design and correct shortcomings 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

SUBTOTAL / 15

1C. STUDY PROJECT – the collection and analysis of data to reveal evidence of a fact or situation of scientific interest, possibly including surveys, the study of cause and effect relationships, or theoretical investigations of previously published scientific data.

PROBLEM / HYPOTHESIS

1. Existing knowledge and background research were integrated into the formation of the problem/objective 0 1 2 3 4 5
2. An objective was clearly identified and provided direction and appropriate scope for the project 0 1 2 3 4 5

SUBTOTAL / 10 _____

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 and verified) 0 1 2 3 4 5
5. The research data were comprehensive and well-organized 0 1 2 3 4 5
6. Logbook recorded progress of the project, including detailed research notes, resources and discussions 0 1 2 3 4 5

SUBTOTAL / 20 _____

ANALYSIS / CONCLUSION

7. Key scientific concepts, including alternate viewpoints, of the research topic were identified and explored 0 1 2 3 4 5
8. Critical analysis/interpretation of research material was presented (e.g. comparison of sources, surveys and statistics) 0 1 2 3 4 5
9. Logical conclusions based on the research were reached 0 1 2 3 4 5

SUBTOTAL / 15 _____

SECTION 1 TOTAL / 45 _____

2. CREATIVITY AND INSIGHT

1. The problem was approached with originality 0 1 2 3 4 5
2. Independent motivation, design and thinking were demonstrated 0 1 2 3 4 5
3. Resourceful use of equipment and/or materials was shown 0 1 2 3 4 5
4. Improvements than can be made to the project were indicated 0 1 2 3 4 5
5. Practical applications and future research for the project were identified 0 1 2 3 4 5

SECTION 2 TOTAL / 25 _____

3. COMMUNICATION

10. The oral presentation was clear, logical and concise 0 1 2 3 4 5
11. Answers to questions were clear and showed significant depth of understanding 0 1 2 3 4 5
12. All required written information including credits, citations and applicable ethics/consent forms were presented 0 1 2 3 4 5
13. The visual display was effective, with a logical and self-explanatory layout 0 1 2 3 4 5

SECTION 3 TOTAL / 20 _____

4. DEGREE OF DIFFICULTY

14. The project was exceptional (considering the student's grade level) 0 1 2 3 4 5
15. The student gained a deeper understanding of the topic 0 1 2 3 4 5

SECTION 4 TOTAL / 10 _____

5. TOTAL SCORE Add the total scores from Section 1 through 4 and record the final mark here. **TOTAL SCORE / 100 _____**

Words or Phrases for Positive Comments

- Acted confident
- Animation
- Appeared at ease
- Articulate
- Clear
- Coherent
- Colorful
- Communicative
- Confident
- Conversational
- Creative
- Descriptive
- Desire to tell
- Eager to share
- Effective
- Enjoyable
- Enjoyed speaking
- Entertaining
- Enthusiastic
- Exciting
- Expression
- Eye Catching
- Forceful
- Friendly manner
- Gestured
- Humorous
- Impressive
- Informative
- Inspiring
- Instructive
- Interesting
- Lively
- Memorable
- Not memorized
- Original
- Outstanding
- Sincere
- Smiled
- Sparkling
- Stimulating
- Stirring
- Striking
- Think on feet
- Thoughtful
- Thought provoking
- Unique
- Unusual
- Variety of resources
- Vivid
- Well illustrated
- Well informed
- Well organized
- Well planned
- Well prepared
- Well researched

Ways to Say "Very Good"

- You really learned a great deal
- You are an expert on your topic
- Nothing can stop you now.
- You really make this fun.
- That's what I call a great job.
- You must have practiced!
- Right on!
- Fantastic!
- You haven't missed a thing!
- I have learned something today.
- I appreciated that you didn't read your material
- Way to go!
- That's great!
- Sensational!
- Congratulations!
- Excellent research!
- You made history come alive!
- Superb!
- Fabulous
- Obvious that you took great pride in your work!