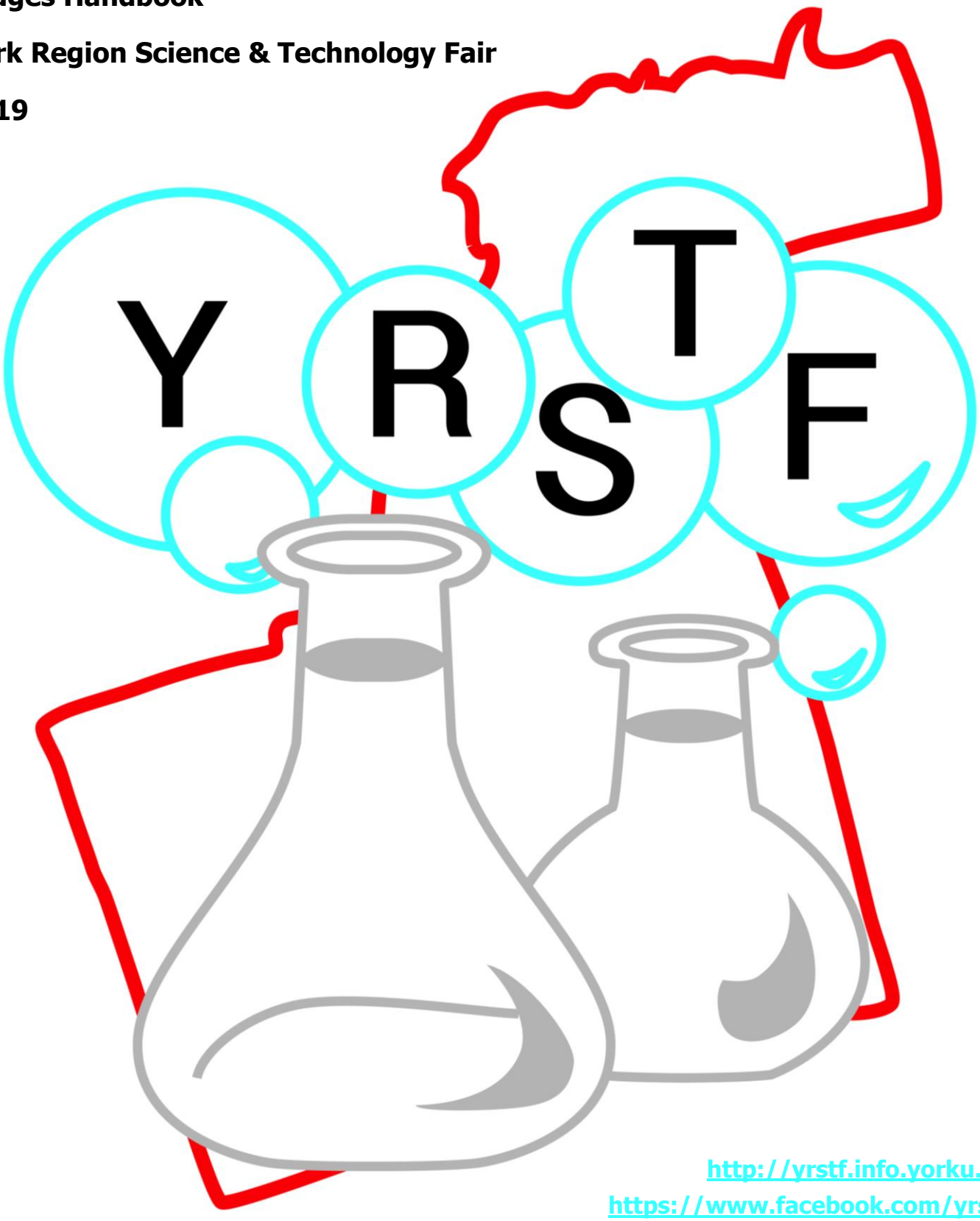
Judges Handbook

York Region Science & Technology Fair

2019



http://yrstf.info.yorku.ca

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Introduction

Congratulations! You are about to make a memorable impact to the lives of young science enthusiasts. Our goal is to provide York Region students with an opportunity to showcase the scientific research on which they have been working. Our students range in age from 12-18, and represent Grades 7-12 across the region. Whether it is their first time presenting at YRSTF or their fifth, our students come prepared to share their best work, be inspired, and learn from the experience. YRSTF provides an opportunity to showcase not only their scientific work, but through the process of preparing a project, engages them in authentic problem solving, critical thinking, and the development of communication skills. By participating, we hope that students will gain self-confidence, a sense of accomplishment for a job well done, and a continued passion for science. Our YRSTF judges play an important role in making sure YRSTF is a rewarding and positive experience for ALL students.

The Role of the Judge

The role of YRSTF Judge is to evaluate the different aspects of a research projects based on the YRSTF evaluation rubric. Judges are expected to create a positive and memorable experience for students. Judges must be positive, encouraging, and provide constructive feedback. They should be prepared to suggest how the project could be improved as well as encourage students to pursue their passion in science.

Conflict of Interest

All YRSTF Judges must be free of *any real or apparent* conflict of interest. All possible conflicts of interest must be declared when completing the Judge registration. If a conflict of interest becomes apparent on the day of the Fair, all conflicts should be immediately disclosed to our Chief Judge.

Conflicts of interest arise when:

- Your child is competing;
- A relative of yours is competing;
- A student you directly teach or tutor is competing.

YRSTF does not allow any relatives or teachers/tutors of participants to judge.

If you find yourself in a conflict of interest, but would still like to help out, please contact nathalie.rudner@yrdsb.ca to discuss how you might be able to support the fair.

Commitment to Fair Day

A science fair cannot happen without judges. Every year we schedule over 70 judges to judge more than 130 projects. Every project must be judged 3 times by a judge qualified to evaluate the project, based on their education and experience. In recognition of the difficulty in making last minute

changes to the judging schedule, we ask that if you have registered but are now unable to commit to the full morning of judging, or are unable to make the Fair on the actual day (illness, unforeseen circumstances) that you please inform us by emailing nathalie.rudner@yrdsb.ca as soon as possible. This will allow us to make the changes prior to judging to ensure that all projects are evaluated in an equitable manner.

Tips to be an Effective Judge

How to Think about your Role

New judges are often concerned about how to be fair in judging, as they do not evaluate all projects. All projects are evaluated using the same scoring rubric. The rubric has been shared with students prior to the fair so that they are aware of the expectations. On Fair day, all projects are evaluated using the scoring rubric 3 times, by 3 different judges, during 3 different 15-minute timeslots. A single score does not determine whether a project "wins" or "loses" a medal or award.

In the event of major discrepancies between judging scores, the Chief Judge may review the scores and the projects.

Prior to meeting with students, there will be an opportunity to do a quick walk-around of all projects before commencing the judging rounds. During this time, we recommend you:

- locate those projects assigned to you;
- take a brief look at other projects in the category;
- take a moment to scan the boards of the projects you are judging in order to prepare yourself for the judging round.

Upon completion of the judging rounds, there will be time allocated for one final review of the projects, without students present. This walk-around occurs after scores are tabulated and before final decisions are made on the top prize recipients. This review is led by the Chief Judge.

The Importance of Time

Each project evaluation is allocated 15 minutes total. **Please spend the entire 15 minutes with the students**.

- Some students will want to present for the entire 15 minutes, while others may use less time. Encourage students to speak for no more than 5-6 minutes.
- If the project was prepared by two students, both students must spend some time describing the project to give both students an opportunity to demonstrate their understanding of the research.
- When the round is over, please wrap up your conversation with the student and complete your evaluation sheet.

- Every student should get approximately equal time to present their work. Please review the list of suggested questions in the *How to Evaluate Projects* section so that you have something to ask the students should you need to fill the time. If you are filling time, consider asking similar questions to all your participants.

How to Evaluate Projects

- **Familiarize yourself with the evaluation rubric** prior to speaking with the students.
- Introduce yourself to the student(s) and ask them to explain what they have accomplished.
- If necessary, prompt the students with appropriate questions as some may be very nervous or not know where to begin.
- Do not point out to students any errors in spelling or grammar or major flaws in experimental design, instead, please make note of these in the appropriate section of the evaluation rubric.
- You may seek clarification about scientific process, principles or thought. Please do this in a supportive way.
- **Students are required to have a log book. At the regional fair, some students may not have one. Please do not make this an issue. If a project log book is not present, please enter a score of '0' for this**, and allow the students to present their work.
- Ask students about flaws in their logic but do not overly criticize them. Just mark these on your score-sheet.
- **Be positive and supportive.** Many students are very anxious and nervous talking to the judges. For many, this is the first time they are talking about their work to adults. We want this to be a positive experience. Be friendly and supportive for all students.
- **Always look to compliment students on positive aspects of their work** such as: "What a unique approach…", "You must have spent a lot of time to gather your data…", "Your display is very clear and easy to follow", etc.
- After students have finished their presentation, **begin with a few simple questions to evaluate the students' understanding of their works. Examples of questions you might ask include:**

    - What gave you the idea for this project? Why did you choose this topic?
    - How long did it take to gather the data points?
    - What are the main factors that may affect your observations?
    - How many times did you repeat each experiment?
    - What other factors may have influenced your observations?
    - I am not sure of the meaning of a technical term you used…can you explain it?
    - What variables did you control in this experiment?
    - What are possible sources of error in your work?
    - Please explain the meaning of the graph on your display.
    - Can you think of how your results and conclusions can be applied in the real world?
    - To continue this work, what further experiments would you conduct?
    - Are there other topics regarding your work you would like to discuss?
    - What might you do differently if you had to repeat the experiment?
    - How might what you have learned be useful to others?

- If you happen to be an expert in the area of the project, do not expect students to approach your level of understanding. Many of our students are in Grade 7 and 8 and this is the first time they are engaging in scientific research.
- Students should do most of the talking.
- If students present flawed information, rather than correcting them, ask probing questions to determine their true understanding of the topic. Make a note of their understanding on the evaluation rubric.
- **Concentrate on the process of their work, including the scientific method, design thinking, and problem-solving skills.** A good project will demonstrate a strong understanding of the scientific method, design thinking, and/ or problem-solving skills.

- **Please record 2-3 comments about the project that can assist students in improving it in the future**. Please refer to the comment bank provided to judges for comments to be used. Please include at least 1 strength comment in your feedback and 2 recommendations. Students are will be provided with summary of judges' comments at the end of the day. When selecting comments, please select comments which will support overall project improvement. Limit your comments to 5.

- **Take a moment to review the special awards and make recommendations.** If you judge a project that you think should be considered for a special award, please indicate this on the special awards sheet that you will submit to the judges table**.**

- **Thank the students for sharing their work with you.** Always end the judging round on a positive note.

- **Do NOT tell their final score, where they lost marks or how they compare to other projects.** (e.g., Your project is the best one I've seen today).

- **Complete your score-sheets as you judge/right after you judge the project and hand them in at the Judging table.** It is important to have judges' sheets returned to the judging room continuously so that we may process them in a timely manner.

- **Remember to sign your score-sheet before you hand it in**! The volunteers who are tabulating all of your scores and comments cannot do their work if they are unable to match your name with your score-sheet.

- Please refrain from discussing projects on the exhibit floor in the presence of others. Your discussions may be overheard by other students standing close-by.

Improving Communication with Students

Some students may feel intimidated by the judges and the general judging process. In order to make students more comfortable, please consider the following:

- Listen actively;
- Make eye contact with the student;
- If the student is much shorter than you, stoop or squat down to lower your eye level, or sit on a chair;
- Tip your head to the side a little to indicate interest (this is a universal nonverbal form of communication);
- If you wear glasses, look at the student through them, not over the top of the frames;
- Whenever a student illustrates a creative idea, well-organized display, or anything else positive about their work, be sure to compliment them;
- Use a tone of voice that indicates interest or inquisitiveness, not skepticism or contempt.

A note on shaking hands: Please refrain from shaking hands with students unless the student initiates it. Some of our students do NOT shake hands.

Parent /Mentor Involvement

Some people worry about how much parents or other mentors were involved in the projects. Adult involvement is an excellent way for students to develop the skills necessary to conduct proper investigations. It is appropriate for adults to support the students by:

- helping with topic selection;
- overseeing safety;
- guiding students with experimental design;
- teaching the science behind the experiment.

Regardless of adult support, the student is responsible for demonstrating the following:

- a thorough understanding of the experiment/project and how it was conducted;
- evidence that the work is their own (log book, photos, display, etc.);
- being able to fully explain the project, conclusions drawn, and the process used to achieve the results;
- an understanding of the relevance of their project.

Students MUST acknowledge the contributions of any adult who has helped or mentored them. This should be in their acknowledgements section of their final report.

Students that have clearly performed their research in a scientific lab, must have declared this, their mentor and have proper acknowledgement in their report.

PLEASE NOTE: Projects completed in a scientific laboratory with a mentor should be judged in the same manner as all other projects with a focus on the students' understanding the scientific process and scientific principles.

REMEMBER: If a student can clearly articulate the scientific process, an understanding of the scientific principles, and has a clear understanding of their work, this should be reflected in the evaluation rubric, regardless of adult support and access to research facilities.

Judge's Comments

Recommendations

Comment Number	Comment
	Oral Presentation
R01	Try not to read from your cue cards. Use your display to support your presentation.
R02	Use eye contact during oral presentation.
R03	You need a little more enthusiasm.
R04	Both participants should participate in the oral presentation.
R05	Speak louder in your oral presentation.
R06	Slow down in your oral presentation.
	Display Presentation
R07	Keep your report short and concise.
R08	Ensure that the materials on your display board are securely fastened.
R09	Larger font size on your display would make the text easier to read.
R10	The flow of the information on your display board was disjointed.
R11	Display is too large.
R12	Ensure consistency in the labelling of graphs and/or visuals.
R13	Bring your report and display it with your project.
R14	Some pictures would help to visualize your experiment.
R16	Supplying a model would enhance your presentation.
	General Comments
R16	As a scientific project, it would be helpful to carry out some comparison between your method and an existing method.
R17	K.I.S. (Keep it simple)
R18	Consider the practical challenges with/of...
R19	Additional research on...
R20	Define or focus the purpose of your project more clearly.
R21	Try to find methods that are a bit more quantitative so you can use statistical analysis.
R22	Test variables independently.
R23	It would be good to see a more in-depth analysis of...
R24	Consider controls and variables when evaluation of results.
R25	In the future, a bigger sample size would improve your ability to detect differences between...

Judge's Comments

Strengths

Comment Number	Comment
	Presentation
S01	Very enthusiastic presentation.
S02	Well spoken and knowledgeable about the content of the project.
S03	Well-organized and clear presentation.
S04	The use of multiple trials on the same experimental material showed excellent application of scientific method.
S05	Good explanation of control variables.
S06	The inclusion of a glossary supported your project.
S07	The visual display was fabulous. I especially liked...
S08	Graphs clearly showed ones results.
S09	Presentation was concise and reflected an application of the results.
S10	The idea was creative and innovative.
S11	Photos and material used were attractive.
S12	The presentation delivery was very good.
S13	Exceptional speaking and presentation skills.
S14	Student was confident, well spoken, and clear and answered all the questions very well.
S15	Great use of video to demonstrate project.
	Project Understanding
S16	Clear and thorough and good understanding of the topic.
S17	Comprehensive, thorough understanding of the topic.
	General Comments
S18	Excellent idea. I liked your selection...
S19	Appropriate amount of research used to support the project.
S20	Good "out of the box" thinking!
S21	You learned a significant number of very complicated lab skills – very impressive.
S22	Project exhibits application in the real world.
S23	Good scientific approach.
S24	Extensive research and time was taken to carry out and complete the project.
S25	Congratulations! You have a solid grasp and understanding of your experiment.
S26	A very interesting topic – you were very passionate about your topic and made recommendations on your future improvements.

Judges Marking Sheet: Regional Science and Engineering Fair

PART A: SCIENTIFIC THOUGHT – 45%

Experiment Undertake an investigation to test a scientific hypothesis by the experimental method. At least one independent variable is manipulated; other variables are controlled.	**Innovation** Develop and evaluate new devices, models, theorems, physical theories, techniques, or methods in technology, engineering, computing, natural science, or social science.	**Study** 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.	
Level 1 (Low) – Mark Range 6 to 15			Circle One Mark
Replicate a known experiment to confirm previous findings.	Build a model or device to duplicate existing technology or to demonstrate a well-known physical theory or social/behavioural intervention.	Existing published material is presented, unaccompanied by any analysis.	6 7 8 9 10 11 12 13 14 15
Level 2 (Fair) – Mark Range 16 to 25			
Extend a known experiment with modest improvements to the procedures, data gathering and possible applications.	Improve or demonstrate new applications for existing technological systems, social or behavioural interventions, existing physical theories or equipment, and justify them.	Existing published material is presented, accompanied by some modest analysis **and/or** a rudimentary study is undertaken that yields limited data that cannot support an analysis leading to meaningful results.	16 17 18 19 20 21 22 23 24 25
Level 3 (Good) – Mark Range 26 to 35			
Devise and carry out an original experiment. Identify the significant variables and attempt to control them. Analyse the results using appropriate arithmetic, graphical or statistical methods.	Design and build innovative technology; or provide adaptations to existing technology or to social or behavioural interventions; extend or create new physical theory. Human benefit, advancement of knowledge, and/or economic applications should be evident.	The study is based on systematic observations and a literature search. **Quantitative studies** should include appropriate analysis of some significant variable(s) using arithmetic, statistical, or graphical methods. **Qualitative and/or mixed methods studies** should include a detailed description of the procedures and/or techniques applied to gather and/or analyse the data (e.g. interviewing, observational fieldwork, constant comparative method, content analysis).	26 27 28 29 30 31 32 33 34 35
Level 4 (Excellent) – Mark Range 36 to 45			
Devise and carry out original experimental research in which most significant variables are identified and controlled. The data analysis is thorough and complete.	Integrate several technologies, inventions, social/behavioural interventions or design and construct an innovative application that will have human and/or commercial benefit.	The study correlates information from a variety of peer-reviewed publications and from systematic observations, and reveals significant new information, or original solutions to problems. Same criteria for analysis of significant variables and/or description of procedures/techniques as for Level 3.	36 37 38 39 40 41 42 43 44 45

PART B: ORIGINAL CREATIVITY – 25%

Level 1 (Low) Mark Range 6 to 10	Level 2 (Fair) Mark Range 11 to 15	Level 3 (Good) Mark Range 16 to 20	Level 4 (Excellent) Mark Range 21 to 25
The project design is simple with little evidence of student imagination. It can be found in books or magazines.	The project design is simple with some evidence of student imagination. It uses common resources or equipment. The topic is a current or common one.	This imaginative project makes creative use of the available resources. It is well thought out, and some aspects are above average.	This highly original project demonstrates a novel approach. It shows resourcefulness and creativity in the design, use of equipment, construction and/or the analysis
6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25

Judges Marking Sheet: Regional Science and Engineering Fair - page 2

PART C: VISUAL DISPLAY – 15%		TOTAL
Layout logical and self-explanatory	1 2 3 4 5	
Information content / substance	1 2 3 4	
Readability / clarity	1 2 3	
Exhibit attractive and well-constructed	1 2 3	

PART D: ORAL PRESENTATION – 8%		TOTAL
Clear, logical, enthusiastic presentation	1 2 3 4 5	
Response to questions	1 2 3	

PART E: PROJECT REPORT & PROJECT LOG – 7%		TOTAL
Bibliography and citations	1 2 3	
Project log (hard copy or electronic)	1 2 3 4	

PROJECT EVALUATION SUMMARY		MAX	MARK
PART A	Scientific Thought (from page 1)	45	
PART B	Original Creativity (from page 1)	25	
PART C	Visual Display	15	
PART D	Oral Presentation	8	
PART E	Project Report & Project Log	7	

JUDGING NOTES

TOTAL MARK AWARDED TO THIS PROJECT	

FEEDBACK FOR THE STUDENTS
Strengths
Recommendations

Judge's Name (Please print.)	Judge's Signature