



2017 Peel Region Science Fair

University of Toronto at Mississauga (UTM)
April 25-26



Peel Region
Science Fair

2017 PEEL REGION SCIENCE FAIR TEACHER GUIDE

ENGAGING AND SUPPORTING YOUNG SCIENTISTS IN PEEL.

www.peelscience.ca

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Welcome!

Dear Science Fair Contact

The Peel Region Science Fair (PRSF) is a unique opportunity to promote project based science for the youth of today. This science exhibition is one of nearly 100 fairs across Canada and 27 across Ontario that celebrates the work of young scientists and recognizes excellence in their research and innovation.

This package contains information you need to help students register their projects for the fair. Please note that the **registration deadline is 4/1/2017**. The deadline cannot be extended. Early registrations will be accepted. Registration opens **1/15/2017**. All registrations are to be completed online at www.peelscience.ca.

Each school is able to enter a maximum of 6 student projects and we **encourage each participating school to have at least one teacher participate as a judge at the 2017 Peel Region Science Fair**. **Registration for judges can also be completed online at www.peelscience.ca**. Judges will be able to declare their affiliation with a particular school and/or the name a teacher already registered as a judge from the school.

Students who participated in last year's Peel Region Science Fair are also invited to participate this year. These student alumni must have their projects approved by an appropriate supervisor (teacher or mentor). The alumni's projects may be included, by your discretion, as an addition to your school team of 6 projects.

*****NEW FOR 2017***** All projects must display a report (maximum 5 pages). Report guidelines must adhere to CWSF restrictions (see [CWSF project report guidelines](#) for more information)



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Safety and Ethics at PRSF

Adapted from Youth Science Canada Policy 1.5.5 as of October 1, 2014¹

Participants at Peel Region Science Fair are expected to conduct their research in a safe and ethical manner. The integrity of the fair is based on a continuing commitment, from all stakeholders, to safety and academic honesty.

All participants will present work that is the result of their own efforts. All assistance received from others will be acknowledged. All written material that draws on the work of others will be accompanied by appropriate references.

All participants can expect their work to be judged on its merits. Judges will attempt to provide each participant with constructive feedback to help participants improve their work.

Participants who violate the spirit of academic honesty at PRSF may be subject to disciplinary action, which may include disqualification. Violations of academic honesty include, but are not exclusive to:

1. Plagiarism - presenting the work of others as your own, without acknowledging the source. Scientific work includes scientific results, conceptual development of a topic, or substantive formulation or reformulation of a problem. This includes work done by a family member or a mentor. Information on how to properly cite references can be found in Policy 3.1.2.4 CWSF Project Report.
2. Fabricating or falsifying data.
3. Forging signatures.
4. Fabricating or falsifying registration information.
5. Entering a project which is derived from a previous PRSF project (continuation or revision of a project undertaken in a preceding year by the student or by another) without documenting the previous work.
6. Entering a project which has, or will be, entered for judging in another regional science fair.

¹ YSC Policy 1.5.5, available at <http://cwsf.youthscience.ca/policy/academic-integrity-finalists>, accessed 1 October 2014.



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Anonymous allegations of academic dishonesty, or those without supporting evidence, will be ignored. If an allegation is brought to the attention of a PRSF organizing committee member, the committee (or part thereof) will gather evidence, evaluate it, and talk with the participant(s) in question. The committee will then rule on whether a violation of academic honesty has occurred.

All projects at the Fair must adhere to the Youth Science Canada ethics and safety policies.

All projects that require the participation of humans or the use of animals, must be reviewed before the experiment starts to educate the young scientist in the issues involved, and to ensure that the project meets the Youth Science Canada rules for science fairs.²

Participants are reminded to bring their completed Safety Checklist (from the Student Registration Guide) to the fair. This page is required in order to be considered for judging.

In addition, participants are reminded that:

- Living organisms, tissues, or cells (including animals, plants, fungi, protozoa and bacteria) are **NOT permitted** to be displayed.
- Dangerous, toxic, corrosive, flammable, and radioactive materials are **NOT permitted** to be displayed. Inert substitutes (i.e. coloured water, salt, sugar, baking soda, etc.) may be used to represent these materials. When labelling these substitute materials, write the chemical name and the word "simulated" on the container.
- All electrical devices (including extension cords and student-built devices) must be CSA-approved and grounded (i.e. 3-pronged plug) before being connected to AC circuits.

Any questions regarding project safety and ethics may be directed to the [Ethics Committee](#).

² YSC rules and accompanying forms are available at <http://cwsf.youthscience.ca/node/835>



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Science Displays

Peel Fair participants may select from a wide variety of materials, including pre-constructed corrugated cardboard and foam-core board.

Students are expected to attach all information securely to the backboard. Students selected for the Canada-Wide Science Fair will be required to redo their display to meet national science fair safety regulations.

The project should include a signed safety checklist (available in the student registration package) and a participant signature page (available online once registration is complete).

You are requested to do the following:

Each student must complete the registration online form per exhibit. In the case of a group project both parental signatures are required.

Ensure that registration is completed online by **4/1/2017**.

Bring an adult to accompany the student(s) during setup. Supervision by the organizing committee will be limited to the exhibit hall.

The Peel Region Science Fair committee wishes to extend its sincere appreciation for your support. We wish your school and your students the greatest success. If you have any questions about registration, do not hesitate to contact the PRSF committee at info@peelscience.ca.



Project Classification

Category

There are 3 categories of project based on the student's school grade. Junior (Grade 7 & 8), Intermediate (Grade 9 & 10) and Senior (Grade 11-12). For projects completed by two students, the category is that of the highest-grade member.

Type

There are 3 types of projects that help judges characterize the nature of the work: **Experiment**, **Innovation** and **Study**. All three types are equivalent, but differ somewhat in the way they are conducted and evaluated.

The following may help clarify the differences:

- **Experiment**
Involves the testing of a specific hypothesis with the control of significant variables. Judging emphasis is on the experimental design and analysis of the data.
- **Innovation**
Involves the development and evaluation of new devices, models, techniques or approaches, usually in technology, engineering or computers. Judging emphasis is on the design process, application of scientific and engineering principles or human benefit
- **Study**
Involves the collection and analysis of data from sources other than the student's own work to reveal evidence of a fact, situation, or pattern. Judging emphasis is on insightful analysis.

Judges at the Science Fair will be looking at a combination of written information and the student presentation. Successful students will be able to demonstrate depth and breadth of knowledge for the scope of their project. The project should exhibit qualities of excellence and creativity.



Safety Regulations

1. Backboards may be constructed using a variety of materials. Fire retardant materials are preferred, but corrugated cardboard, foam-core board, etc. will be accepted. Students selected to represent Peel at the Canada-Wide Science Fair will be required to prepare a board according to strict fire regulations specified by YSF Canada.
2. The exhibit must be sturdy, self-supporting and fit within the following dimensions: height = 1.6 m, width = 1.2 m (side to side), and depth = 0.8 m (front to back).
3. All portions of your visual presentation must be in full contact with the backboard (i.e., no loose pages or corners). It is a good idea to bring a glue stick for quick repairs! Extensions to the backboard (e.g., for a title) are permitted, but must fit within the required space.
4. Students are not required or expected to perform any experiments for the judges. They are interested in the results and the student's explanation. Thus, students do not need to bring the equipment or materials used in their project. Photographs are more convenient and effectively show what was done.
5. If a student must bring materials for his/her presentation, substitutes are required for all dangerous, toxic, corrosive, flammable, or radioisotope materials. Coloured water, salt, sugar, and baking soda are some substitutes that can represent these chemicals. When labelling these substitute materials for display, write the chemical name on the container and the word "simulated."
6. All electrical devices, including extension cords and student-built devices, must be CSA-approved before being connected to AC outlets. All plugs must have 3 prongs (3-wire conductor including a ground).
7. **Living organisms (including plants, animals, fungi, protozoa and bacteria) may NOT be displayed.** Soil containing organic material **may NOT be** displayed. Use photographs to show results. Experimentation with vertebrates (including humans and pets) is strictly controlled in Canada and must not involve any harmful physical or emotional effects.
8. Experimentation involving hazardous materials must be carried out under controlled laboratory conditions and with a qualified supervisor.

Please Note:

This is a summary of the safety regulations. Please consult <http://cwsf.youthscience.ca/projects-ethics> and <http://cwsf.youthscience.ca/projects-safety> for the detailed rules as specified by Youth Science Canada.



Overall Evaluation

	A. EXPERIMENT	B. INNOVATION	C. STUDY	Type
	An investigation undertaken to test a scientific hypothesis experimentally. The variables, if identified, are controlled to some extent	The development and evaluation of innovative devices, models or techniques or approaches in technology, engineering or computers (hardware or software).	A collection and analysis of data to reveal evidence of a fact or a situation of scientific interest. It could include a study of cause and effect or theoretical investigations of scientific data.	
				Check
Level 1	Duplicate a known experiment to confirm the hypothesis. The hypothesis is totally predictable.	Build models (devices) to duplicate existing technology.	Study existing printed material related to the basic issue.	
Level 2	Extend a known experiment through modification of procedures, data gathering, and application.	Make improvements to or demonstrate new applications for existing technological systems or equipment and justify them.	Study material collected through a compilation of existing data and through personal observations. Display attempts to address a specific issue.	
Level 3	Devise and carry out an original experiment. Identify and control some of the significant variables. Carry out an analysis using graphs or simple statistics.	Design and build innovative technology or provide adaptations to existing technology that will have human benefit and/or economic applications.	Carry out a study based on observations and literary research illustrating various options for dealing with a relevant issue. Include appropriate analysis (arithmetic, statistical, or graphical) of some significant variable(s).	
Level 4	Devise and carry out original experimental research, which attempts to control or investigate most significant variables. Include statistical analysis in the treatment of data.	Integrate several technologies, inventions or designs and construct an innovative technological system that will have human and/or commercial benefit.	Correlate information from a variety of significant sources, which may illustrate cause and effect or original solutions to current problems through synthesis. Identify significant variable(s) with an in-depth statistical analysis of data.	



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Evaluation – Project Marking Sheet:

SCIENTIFIC THOUGHT AND KNOWLEDGE (Value 60%)	1 = Poor 5 = Average 10 = Excellent										
Is there a viable commercial application or significant human benefit?	1	2	3	4	5	6	7	8	9	10	
Does the student understand the scientific or engineering principles, laws, or theories related to the project at a level appropriate to the project?	1	2	3	4	5	6	7	8	9	10	
Is there a well-defined objective or purpose given for the project?	1	2	3	4	5	6	7	8	9	10	
Does the design of the investigation effectively address the problem identified?	1	2	3	4	5	6	7	8	9	10	
Does the student demonstrate refinement/improvement to the design?	1	2	3	4	5	6	7	8	9	10	
Are the significant variables recognised and controlled?	1	2	3	4	5	6	7	8	9	10	
Are observations clearly and logically organised?	1	2	3	4	5	6	7	8	9	10	
Did the student gather data from suitable sources?	1	2	3	4	5	6	7	8	9	10	
Has the student amassed an appropriate and relevant data sample?	1	2	3	4	5	6	7	8	9	10	
Is there strong evidence of a fact, situation or pattern of scientific interest?	1	2	3	4	5	6	7	8	9	10	
Is the conclusion valid based on the data collected?	1	2	3	4	5	6	7	8	9	10	Total
Does the student have clear ideas for further research or applications?	1	2	3	4	5	6	7	8	9	10	
ORIGINALITY or CREATIVE ABILITY (Value 15%)											
	1 = Poor 5 = Average 10 = Excellent										
Does the project demonstrate originality at a level appropriate to the student?	1	2	3	4	5	6	7	8	9	10	
Does the project show resourcefulness and/or creativity in design?	1	2	3	4	5	6	7	8	9	10	
Does the investigation of the phenomenon or the design process, incorporate a novel approach?	1	2	3	4	5	6	7	8	9	10	Total
Is the data obtained, analysed or interpreted in an original way?	1	2	3	4	5	6	7	8	9	10	
DISPLAY (Value 15%)											
	1 = Poor 5 = Average 10 = Excellent										
Does the display use a clear and logical approach to explaining itself?	1	2	3	4	5	6	7	8	9	10	
Does the exhibit make appropriate use of various media? (Equipment and gadgets that are simply decorative will be ignored and may be counted against the exhibit).	1	2	3	4	5	6	7	8	9	10	
Are charts, diagrams, graphs etc. used in a meaningful way, which supports the presentation?	1	2	3	4	5	6	7	8	9	10	Total
Does the exhibit demonstrate good workmanship? (I.e., Does everything work as it should?)	1	2	3	4	5	6	7	8	9	10	
PRESENTATION (Value 10%)											
	1 = Poor 5 = Average 10 = Excellent										
Does the student communicate his/her knowledge and understanding?	1	2	3	4	5	6	7	8	9	10	Total
Does the student demonstrate that he/she has completed the project as independently as could be expected for his/her age/grade? (Adult guidance, advice, and supervision of hazardous work is appropriate, but excessive adult involvement counts against the exhibit).	1	2	3	4	5	6	7	8	9	10	



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Schedules of Events

Tuesday, 4/25/2017

2:00 pm - 3:30 pm: Students arrive to set up their projects

2:00 pm - 3:30 pm: Safety checks / Pictures

3:30 - 4:00 pm: Judges preview - **No Students at their exhibits**

3:30 - 5:00pm: Students & parents leave for lunch

4:00 - 5:00 pm: Judges' lunch & briefing

5:00 - 7:00 pm: Judging - All Students at their projects

NOTE: The exhibit hall will be locked after judging.

Wednesday, 4/26/2017

6:00 - 7:00 pm: Public viewing – all students at projects

7:30 - 8:30 pm: Awards ceremony (Dress appropriately)

8:30 - 9:00 pm: Students take their projects home

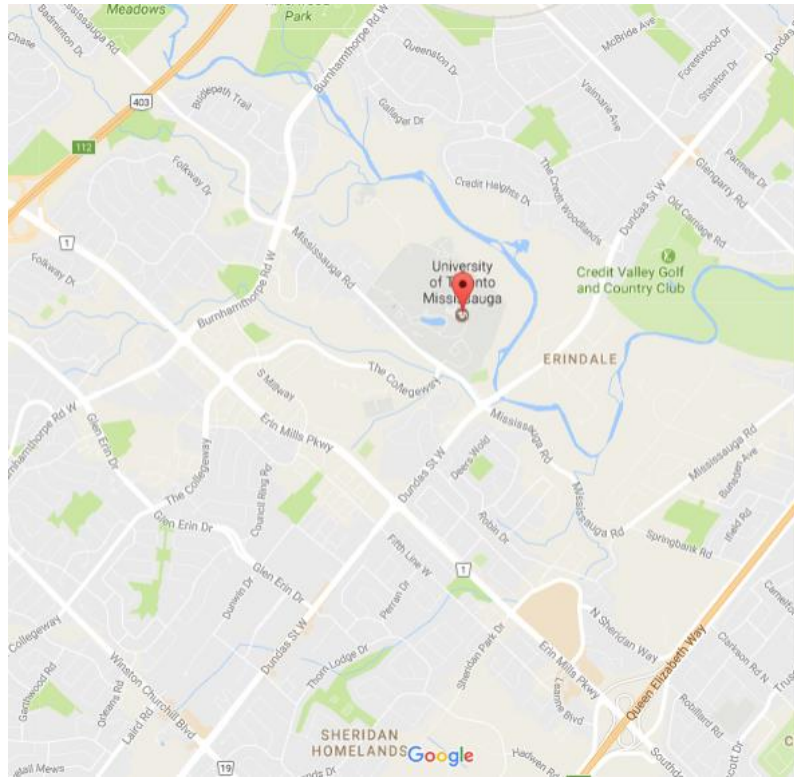
Wednesday, 4/26/2017 (Immediately after Awards Ceremony)

Canada Wide Science Fair Team Meeting / Registration



University of Toronto at Mississauga

Directions:



* UTM is north of Dundas St., south of Burnhamthorpe Rd. (Erin Mills Pkwy & Dundas St area).

Address:

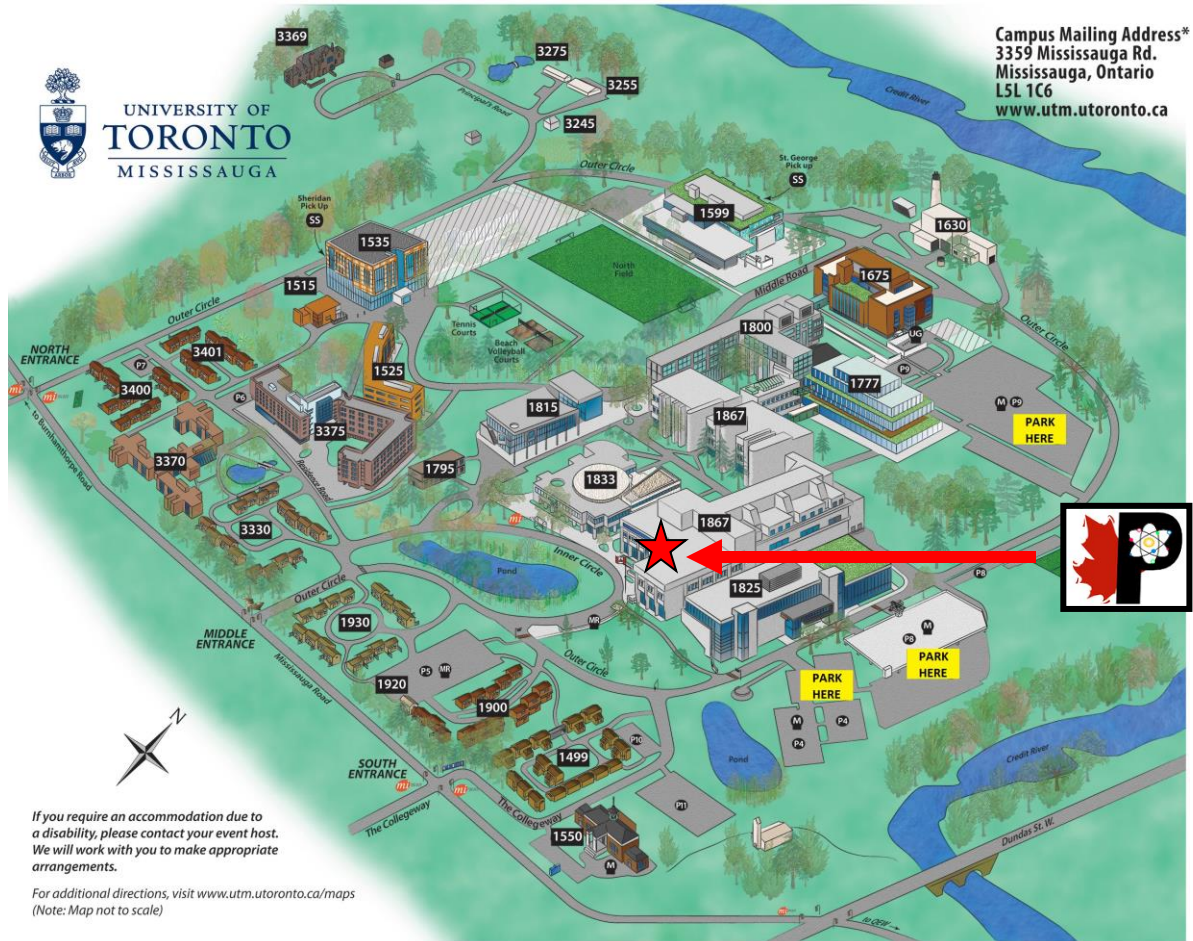
3359 Mississauga Road, Mississauga, ON L5L 1C6

The PRSF will be held in the WG Davis building.



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Parking:

UTM will designate a free parking lot for PRSF participants and judges. This information will be posted at peelscience.ca when it is confirmed. PRSF is not responsible for charges that result from parking infractions.



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Judges Itinerary

The **Peel Regional Science Fair** will be held at the UTM in Brampton on **April 25 & 26** (details below). Many schools have registered from the Public and Separate school boards and private schools in the Region of Peel. We are looking for judges to evaluate students and their projects. Students are competing for monetary prizes, medals and certificates of achievement. The best projects from our region will be travelling to Regina, SK to compete at the Canada Wide Science fair.

Judging at a regional level is an excellent opportunity to work with students who are interested in the field of science. This is an excellent professional development experience as you will be able to evaluate student projects with your peers as well as people in industry. Lunch is provided. Interested judging volunteers please fill out the online registration using the link at the bottom of this page. Please register before **4/1/2017**.

Date: Tuesday, 4/25/2017

Time:

3:30 - 4:00 pm Registration and judge's preview of assigned projects - no students present

4:00 - 5:00 pm Judges lunch and briefing

5:00 - 7:00 pm Judging of assigned exhibits with students present

Note: Judges' marks are compiled and awards will be determined based on these marks. The selection of the Canada Wide Science Fair Team is chosen from the Gold Medal winners.

Judge Registration

Please fill out the online registration form at www.peelscience.ca by **4/1/2017**. Early registrations will be accepted. Registration opens **1/15/2017**.