



Peel Region Science Fair

Science Fair Participant Resource Package

Grades 7–12 · General Science Fair · Peel Region Science Fair · Canada-Wide Science Fair Pathway

From your first idea to your poster, logbook, and judging presentation.



What You Will Learn

Start

choose a focused topic and begin in mySTEMspace.ca

Design

plan a scientific investigation or engineering solution

Build Evidence

collect data, analyze patterns, and explain your conclusion

Follow Rules

prepare safely and meet PRSF display and ethics requirements

Present

explain your project clearly to judges in about 10 minutes

What Is a Science Fair?

It is more than a poster. It is a project story built from evidence.

Student-designed

You choose and understand the question, problem, or idea. Adults can coach, but the thinking and work must be yours.

Evidence-based

A strong project includes research, a method, data or observations, analysis, and a conclusion.

Clearly communicated

You share your work through a display board, logbook, interview, and sometimes a written report.

A good science fair project shows what you did, what you learned, and how your evidence supports your conclusion.



Your Pathway: From Curiosity to the Fair

The goal is not just to win. The goal is to build a project you understand deeply.

01

Curiosity

Notice a problem or question.



02

Project Plan

Choose a type and plan safely.



03

Evidence

Collect data, test, build, or analyze.



04

School Review

Practise and revise your project.



05

PRSF

Present to judges at the regional fair.



06

CWSF

Top projects may advance nationally.



Strong projects are safe, complete, well-understood, and polished enough for external judging.

Start Here: The 15-Minute Version

01 Ask

What problem, question, or idea interests me?

02 Classify

Is this an experiment, engineering project, study, or digital project?

03 Research

What is already known? What sources will I use?

04 Plan

What will I change, measure, build, compare, or analyze?

05 Check

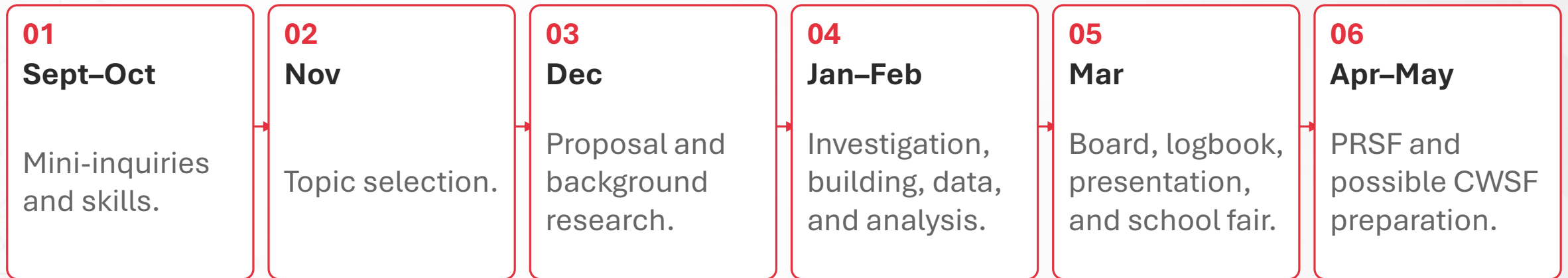
Is it safe, ethical, and possible in the timeline?



Do not start with the display board. Start with the question, the plan, and the evidence.

Suggested Timeline

Adjust dates based on your school deadlines and official PRSF updates.



Recommended checkpoints: proposal • research summary • method/data plan • results/graphs • board/presentation.

We encourage students to continue projects from previous years; however, they must clearly explain what new work, research, or improvements were completed this year.

Use mySTEMspace.ca to Begin

mySTEMspace helps you turn an idea into a project and access a workspace.

1. Create an account

Go to mySTEMspace.ca. Use an email you can access. Confirm that you are a student at a Canadian school.

2. Start a project

Choose “I want to spark an idea,” “I have an idea,” or “I have a project.”

3. Use the workspace

Record your title, summary, plan, safety notes, data, references, and updates.

4. Share later

When the project is ready, follow fair instructions to share or register your project.

01

Initiate & Plan

Start with your interests and skills.

02

Perform & Record

Try your idea and document what happens.

03

Analyze & Interpret

Think about what happened and why.

04

Exhibit & Experience

Share your STEM project story.



Save your password and keep your project information organized from the beginning.

Choose Your Project Type Early

Your project type determines what kind of evidence judges expect.

Experiment / Discovery

Tests how one variable affects another using controlled conditions and repeated trials.

Innovation / Engineering

Designs, builds, tests, and improves a device, process, model, or solution.

Study / Investigation

Analyzes existing data, field evidence, observations, or patterns to answer a question.

Digital / AI / Math

Uses coding, simulation, statistics, models, or algorithms responsibly.



Classify the project early: experiments need variables, engineering projects need criteria and iteration, and studies need reliable data sources.

Suggested Project Fields – CWSF Challenge Areas

Here are some suggested project areas to help guide your ideas.



Agriculture, Fisheries & Food
Food production, farming, fisheries and food security



Curiosity & Ingenuity
STEM discoveries or innovations that don't fit another category



Digital Technology
AI, computing, robotics, electronics and digital systems



Disease & Illness
Understanding, diagnosing, treating or managing illness



Energy
Renewable energy, energy efficiency and reducing energy use



Environment & Climate Change
Water, air, soil, biodiversity and climate solutions



Health & Wellness
Preventing disease and improving human well-being



Natural Resources
Sustainable use, conservation, reuse and recycling of resources



Aerospace

Space, aviation, atmosphere and aerospace technology



These are suggested areas to help guide you, but don't let them limit your creativity, curiosity, or imagination.

Safety and Ethics First

Check rules before you collect data, survey people, work with animals, use chemicals, or build devices.

Ask before you start

Human participants, surveys, health data, animals, biological materials, chemicals, electricity, privacy, and field work may need review.

Use forms when required

Human and animal projects may require official forms and approval. Keep forms with your project.

Display safely

Do not bring risky materials just to “show” your project. Photos are usually better.



When in doubt, ask a teacher, mentor, or fair organizer before doing the work.

Scientific Research Process

Use this process when your project tests a question or discovery with evidence.



01

Observe

Notice a pattern or problem.

02

Question

Ask a focused testable question.

03

Research

Learn what is already known.

04

Hypothesize

Make a reasoned prediction.

05

Investigate

Run a fair test and collect data.

06

Analyze

Use graphs and reasoning.

07

Conclude

Answer the question using evidence.

08

Reflect

Discuss errors and limitations.

09

Revise

Suggest improvements and future work.

For Experimental Projects: From Topic to Testable Question

A good question identifies what changes, what is measured, and what stays the same.

Too broad

“Plastic pollution”
“Plants”
“AI in school”

Better question

How does UV exposure
affect the mass loss of PLA
vs. PET over four weeks?

Why it works

It includes the independent
variable, dependent variable,
comparison, and timeline.

How does [independent variable] affect [dependent variable] when [controlled variables] are kept the same?

Example: How does the [light intensity] affect the growth of a plant [height] when [temperature, humidity and the duration of light exposure] are kept the same?

For Experimental Projects: Variables and Fair Tests

Independent variable

What you change on purpose.

Dependent variable

What you measure or observe.

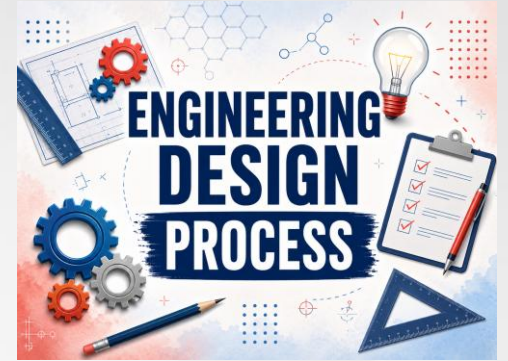
Controlled variables

What you keep the same.

- ✓ Change only one main variable at a time.
- ✓ Use a control or comparison group when possible.
- ✓ Repeat trials so one odd result does not decide your conclusion.
- ✓ Measure in clear units and record raw data in your logbook.

Engineering Design Process

Use this process when your project solves a problem or improves a solution.



01

Problem

What need or problem are you solving?



02

Criteria

How will you know it works?
Define success.



03

Research

What solutions already exist?



04

Prototype

Build a testable version.



05

Test

Collect data using your criteria.



06

Improve

Revise and test again.



Do not hide failures. Failed prototypes and redesigns are evidence that you learned from testing.

For Engineering Design Projects: From Problem to Design Challenge

A strong engineering project starts with a specific problem and a solution that can be tested.

Too broad

“Build a better water filter”
“Make a robot”
“Improve recycling”

Better design challenge

How can I design a low-cost water filter that reduces water turbidity by at least 70% while filtering 500 mL in under 3 minutes?

Why it works

- Identifies the problem or need
- Defines what the solution must do
- Includes measurable criteria
- Includes realistic constraints

How can I design or build **[solution]** that **[performs a function]** while meeting **[criteria]** within **[constraints]**?

Example: How can I design or build **a pressure-sensing wheelchair cushion** that **helps reduce prolonged pressure on the skin** while **remaining comfortable, durable, and inexpensive** within **size and material constraints**?

For Engineering Design Projects: Criteria, Constraints, and Fair Testing

Criteria

What must your design achieve?

Examples: strength, efficiency, safety

Constraints

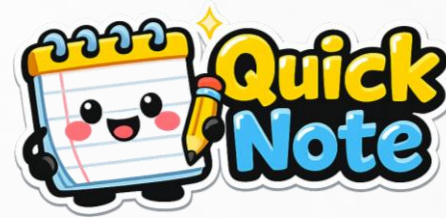
What limits must you work within?

Examples: cost, material property, temperature?

Testing & Iteration

How will you prove that your design works?

- ✓ Use the same testing conditions each time.
- ✓ Collect quantitative data whenever possible.
- ✓ Repeat tests to check reliability.
- ✓ Compare results with your criteria.
- ✓ Modify the design and test again.



A successful prototype is not just one that works—it is one that can be tested against clear criteria and improved using evidence.

Background Research and Sources

- Research helps you understand your project before you begin testing or building.

What to research

Key science ideas
Important vocabulary
Prior work and similar projects
Safety or ethics concerns

Good sources

Textbooks
University or government pages
Peer-reviewed articles
Reliable technical documentation

Use sources honestly

Take notes in your own words. Track author, title, website, and date accessed.



A science fair project is not a copy-and-paste report. Research should support your investigation, not replace it.

AI and Digital Tools: Appropriate Use

Use technology as support. Do not let it replace your thinking.

Appropriate support

- Brainstorming project questions
- Explaining background concepts
- Improving grammar
- Learning coding concepts
- Generating practice judge questions

Not appropriate

- Inventing data
- Generating a report or presentation script that you submit as your own work
- Hiding Sources
- Producing analysis you cannot explain
- Replacing your own reasoning



Be transparent: you must understand and explain every part of your project independently.

Logbook: Evidence of Your Journey

Record your work as it happens, not at the end.

Date	What I did	Observations / Data	Questions	Next steps

- ✓ Include sketches, raw data, photos, failed attempts, changes, and decisions.
- ✓ A digital logbook is acceptable if entries are dated and organized.
- ✓ Judges value honest process and student ownership.

Data Collection and Graphs

A graph is not decoration. It should make the result easier to understand.
Graph is better than data table to visualize the result!

Data tables

Use clear labels and units.
Keep raw data. Show repeated trials when possible.

Graphs

Choose a graph that matches your data. Label axes and include units.

Analysis

Explain the trend, strength of pattern, anomalies, and possible sources of error.



Judge prompt: “What trend do you see, and how do you know your evidence supports your conclusion?”

Conclusion and Future Work

Move beyond “my hypothesis was right/wrong” or “my model does not work.”
Explain what the evidence means.

01

Claim

What answer did the evidence support?

02

Evidence

Which results support the claim?

03

Reasoning

Why does the evidence make scientific sense?

04

Limitations

What could have affected the result?

05

Next Step

What would you improve or investigate next?



A strong conclusion connects the question, data, analysis, and scientific principles.

Peel Region Science Fair (PRSF)

What is Peel Region Science Fair? Check dates and registration details on peelsciencefair.ca.

Our Mission

To inspire and empower students through STEM education, innovation, and discovery while providing meaningful support and opportunities for students and educators.



Who can participate?

Students in Grades 7–12 enrolled in a school located in Peel Region: Brampton, Caledon, or Mississauga.

Divisions

Junior: Grades 7 – 8
Intermediate: Grades 9 – 10
Senior: Grades 11 - 12

Registration basics

Submit project information, abstract or summary, forms if required, and fee confirmation if applicable.

Current note

PRSF 2026 has concluded; Check the website for PRSF 2027 updates.

Do not wait until the deadline. Your teacher may set an earlier school deadline so projects can be reviewed.

PRSF schedule

PRSF is a two-day experience

Day 1:

- Project Setup
- Opening Ceremony
- Project judging

Day 2:

- Public viewing
- Student programming
- Award ceremony



What Judges Are Looking For

Judges reward understanding, evidence, originality, and clear communication.

Scientific Thought and Knowledge

Clear objective, motivated introduction, effective approach, valid analysis, supported conclusions, reflection, future work, and understanding of science principles.

Originality and Creativity

Originality appropriate to grade level, evidence of student contribution, and impact or human benefit.

Presentation and Display

Clear exhibit, meaningful charts and graphs, workmanship, communication, judge questions, and independent work.



Think like a judge: Can I understand the purpose, method, evidence, conclusion, and student contribution quickly?



How the Evaluation Form Works

The evaluation form gives more weight to the science than to appearance alone.

65% Scientific Thought and Knowledge

Purpose, approach, analysis, conclusions, discussion, future work, and scientific principles.

15% Originality and Creativity

Original idea, student contribution, and impact or human benefit.

20% Presentation and Display

Clear display, graphs, workmanship, communication, questions, and independent work.



A beautiful board cannot make up for weak evidence or a project you cannot explain.

Scientific Thought and Knowledge (Value 65 %)	1 = Poor, 5 = Average, 10 = Excellent										Total:
Abstract: Is there a well-defined objective/purpose and project summary?	1	2	3	4	5	6	7	8	9	10	
Introduction: Is the objective well motivated/explained?	1	2	3	4	5	6	7	8	9	10	
Approach: Does the design of the investigation effectively address the problem identified?	1	2	3	4	5	6	7	8	9	10	
Analysis: Was the analysis scientifically valid?	1	2	3	4	5	6	7	8	9	10	
Conclusions: Are the conclusions valid based on the analysis?	1	2	3	4	5	6	7	8	9	10	
Discussion: Does the student accurately comment/reflect on the conclusions suggested by their data?	1	2	3	4	5	6	7	8	9	10	
Does the student have clear ideas for future work?	1	2	3	4	5	6	7	8	9	10	
Does the student understand the scientific principles related to the project at an appropriate level?	1	2	3	4	5	6	7	8	9	10	

Originality and Creativity (Value 15 %)	1 = Poor, 5 = Average, 10 = Excellent										Total:
Does the project show originality appropriate to the student's grade level?	1	2	3	4	5	6	7	8	9	10	
Evidence of student contribution to the design and execution?	1	2	3	4	5	6	7	8	9	10	
Is there an impactful application or human benefit?	1	2	3	4	5	6	7	8	9	10	

Presentation and Display (Value 20 %)	1 = Poor, 5 = Average, 10 = Excellent										Total:
Does the exhibit convey details clearly and effectively and uses charts/graphs in a meaningful way?	1	2	3	4	5	6	7	8	9	10	
Does the exhibit demonstrate good workmanship?	1	2	3	4	5	6	7	8	9	10	
Does the student effectively communicate their understanding?	1	2	3	4	5	6	7	8	9	10	
Does the student handle judge's questions competently?	1	2	3	4	5	6	7	8	9	10	
Does the student demonstrate that they have completed the project independently (as could be expected given the grade level and safety)?	1	2	3	4	5	6	7	8	9	10	

Overall Evaluation					
The overall level of the project was:	Level:	1	2	3	4

Level 1 - Basic

- Project duplicates a known experiment with predictable results.
- Device replicating existing technology is constructed.
- Study has little focus and/or few published sources.

Level 2 - Noteworthy

- An existing device is improved/used in alternative ways to reach a goal.
- Study covers a specific issue, includes multiple sources and student insight.

Level 3 - Advanced

- Original experiment with control of some significant variables and quantitative analysis of observations.
- Construction of innovative device or development of innovative technique with potential practical application.
- Study focuses on specific issue, uses multiple sources, and includes significant analysis of data gathered.

Level 4 - Exceptional

- Original experimental research with most variables controlled and detailed quantitative analysis of data gathered to draw useful conclusion.
- Construction or design of an innovative device or technique with commercial application or of benefit to society.
- Study includes in-depth analysis of data gathered from multiple sources to provide original solution or significant insight into a current issue.

Project Levels: What They Mean

Level 1 – Basic

Known experiment with predictable results, replica device, or unfocused study with few sources.

Level 2 – Noteworthy

Improves or reuses an existing device, or studies a specific issue using multiple sources and student insight.

Level 3 – Advanced

Original experiment with some controlled variables and quantitative analysis, innovative device, or significant data analysis.

Level 4 – Exceptional

Detailed control of variables, strong quantitative analysis, practical or social benefit, original insight, or commercial potential.



Your goal: move from “I made something” to “I investigated, tested, analyzed, and can explain what the evidence means.”



How to Improve Your Project Level

Move one level higher by improving the science story, not just the decorations.

From Level 1 → 2

Focused question/problem ·
clear method · meaningful
evidence · basic analysis

From Level 2 → 3

Better controls/testing · stronger
evidence · deeper analysis ·
greater student insight

From Level 3 → 4

Originality · rigorous analysis ·
strong scientific understanding ·
limitations · meaningful impact

To Strengthen Your Project

- Collect sufficient, reliable evidence
- Improve controls, testing, trials, or design criteria
- Go beyond describing results—explain what the evidence means
- Identify limitations and meaningful next steps.

Poster Quality $\neq$ Project Quality

A strong poster and effective presentation can enhance your project, but the quality of your project depends primarily on the strength of its scientific content, evidence, analysis, and understanding.

BEST / STRONG POSTER & PRESENTATION

How clearly can you communicate your science?

- Easy to follow
- Large, readable text
- Clear graphs and diagrams
- Good organization and visual hierarchy
- Concise—not overloaded with text
- Professional and attractive
- Evidence is easy to find
- Presentation is clear and confident

$\neq$

BEST / STRONG PROJECT

How strong is the science?

- Clear and meaningful question/problem
- Strong method or design process
- Reliable evidence and data
- Thoughtful analysis
- Originality and student contribution
- Evidence-based conclusion
- Deep understanding of the science
- Able to explain limitations and future work

Clear Communication



Strong Science



A Highly Competitive Project!

PRSF Display Rules: Size and Setup

Your project board must be sturdy, self-supporting, and within the official display dimensions.

Maximum height

1.6 m

Maximum width

1.2 m side-to-side

Maximum depth

0.8 m front-to-back

Board

Self-supporting

- ✓ All portions must be attached to the backboard; no loose pages or unsecured materials
- ✓ Title extensions are permitted only if they fit within the required dimensions.
- ✓ Bring a glue stick for quick repairs.



PRSF Rules: Restrictions and Safety

Judges want your explanation and evidence. You do not need to perform experiments for them.

Do not display

Living organisms, tissues, or cells
Dangerous, toxic, corrosive,
flammable, or radioactive
materials
Unsafe electrical equipment

Use instead

Photos, diagrams, videos,
labelled simulations, inert
substitutes, and clear written
explanations.

Forms matter

Human and animal projects
require the correct forms.
Projects involving human
participants or vertebrate
animals require the
appropriate forms and
approvals.



Photos are often more convenient and safer than bringing original equipment or materials.

Display Board Expectations

Your board should tell the project story quickly and clearly.

Question	Background	Hypothesis / Criteria	Variables
Method	Data Table	Graphs	Photos / Diagrams
Analysis	Conclusion	Future Work	References



Board = story, not scrapbook. Use large headings, clear graphs, concise text, and enough white space.

Poster Examples – Need Improvement

Study the board like a judge: What is clear? What is confusing? What evidence is easy to find?

A poster that needs improvement may be difficult to follow, cluttered, overly decorative, or missing clearly presented evidence.

What to avoid

Tiny text, loose pages, weak graphs, no clear method, and “decorations over evidence.”

What to do

Use clear sections, readable text, well-labelled visuals and a logical layout.





Poster Examples – Developing

Study the board like a judge: What is clear? What is confusing? What evidence is easy to find?

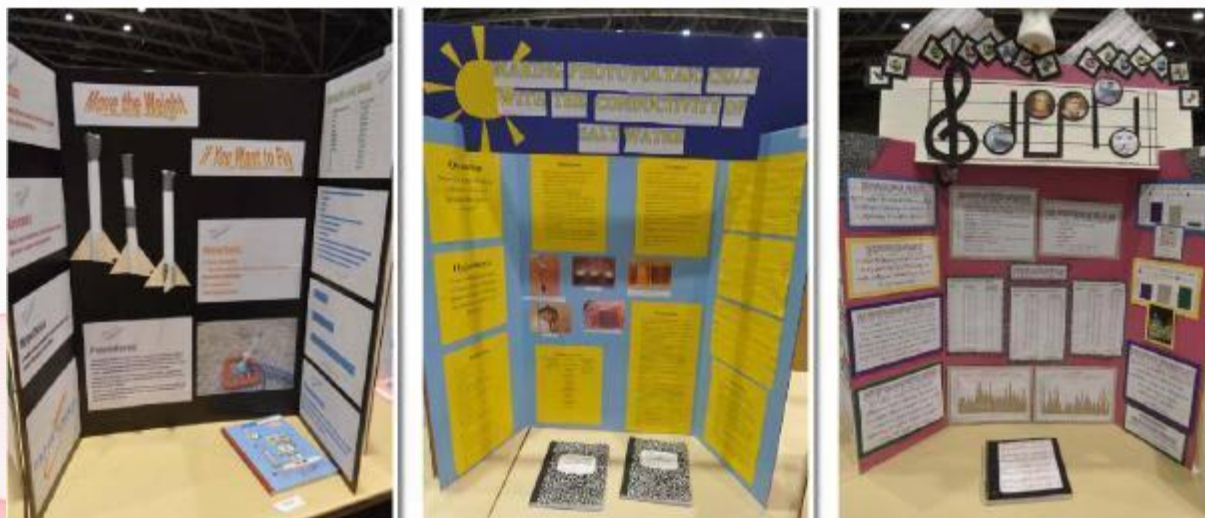
A developing poster shows some organization, but important information may still be difficult to find or interpret.

What to avoid

Too much text, Too much text, small visuals, inconsistent formatting, or important information that is difficult to find.

What to do

Improve headings, reduce text, enlarge graphs, organize sections more clearly, and make key evidence easier to locate.





Poster Examples – Strong

Study the board like a judge: What is clear? What is confusing? What evidence is easy to find?

A strong poster communicates the project clearly, uses readable visuals, and makes the evidence easy to find.

What to avoid

Crowded sections, uneven layout, or results and conclusions that are visually difficult to connect..

What to do

Improve visual hierarchy, spacing, graph labels, consistency, and the connection between results and conclusion.



Poster Examples – Excellent

Study the board like a judge: What is clear? What is confusing? What evidence is easy to find?

An excellent poster is organized, readable, visually balanced, and professional. Its design helps the science stand out.

What to avoid

Avoid clutter even when the science is strong. Every visual must support the story.

What to do

Keep the design concise and balanced. Every graph, image, and section should help communicate the project story.



How to Improve Your Poster

Focus on clear communication!

- ✓ Use clear sections and a logical layout so the project is easy to follow.
- ✓ Keep text concise and readable with large fonts and enough white space.
- ✓ Make graphs, tables, and images clear and easy to understand from a distance.
- ✓ Use consistent formatting for headings, fonts, spacing, and alignment.
- ✓ Highlight the most important evidence and conclusions so judges can find them quickly.



A strong poster is not about adding more—it is about making your project easier to understand.

Required Presentation Format

Prepare a clear project summary and be ready for follow-up questions.

Your target

About 10 minutes for your project summary. Make sure you explain the problem and what you discovered, resolved, or improved.

Judge questions

About 5 minutes for questions and discussion from the judges after they hear from you.

Be ready

PRSF judging may allow up to 20 minutes with each judge, including presentation and questions.



Do not memorize a script you cannot adapt. Practise explaining naturally while pointing to your board and logbook.

What to Say During Your Presentation

Use this structure for a clear 10-minute summary.

01

Hook

Why does this problem matter?

02

Problem / Question

What did you investigate or solve?

03

Methods

How did you test, build, compare, or analyze?

04

Results

What did the evidence show?

05

Conclusion

What did you resolve, discover, or improve?

06

Next Steps

What would you change or try next?

Say clearly

“The problem was...”

“My main method was...”

“The evidence showed...”

Show evidence

Point to your graph, logbook, prototype, photos, or data table as you speak.



Handling Judge Questions

Judges are not trying to trick you. They want to understand your thinking.

Why did you choose this topic?

Connect to curiosity, real-world need, or a personal observation.

What did you change, measure, and control?

Use variables or design criteria clearly.

How do you know your conclusion is supported?

Refer to specific data, graphs, and analysis.

What would you improve?

Be honest about limitations and next steps.

Strong answer frame: “My evidence shows ___ because ___. One limitation is ___, so next time I would ___.”



Our judges

You will be matched with at least three judges during the fair.

- PRSF judges come from diverse scientific communities, including science teachers, graduate students, professors, researchers, and industry professionals.
- All judges receive training before the fair so they understand PRSF expectations and how to provide respectful, professional, and encouraging feedback to students.
- We try to match judges to projects based on their background whenever possible. However, because projects cover many research areas and project descriptions may be limited, a perfect match cannot always be guaranteed.
- Students should be prepared to explain their project clearly to any judge. All PRSF judges have strong scientific backgrounds, so your goal is to make your research understandable, organized, and engaging.

Awards & Recognitions

PRSF recognizes outstanding projects through several award categories.

Merit Awards

Gold, Silver, and Bronze Merit Awards are presented in each division, with corresponding cash awards.

Special Awards

Sponsor-supported Special Awards may include cash awards, scholarships, program opportunities, or other prizes.

PRSF Awards

Additional recognitions may celebrate creativity, artistic design, innovation, or especially imaginative ideas.



Final Student Checklist

Before school fair or PRSF, you should be able to check every box.

- ✓ I can explain my question or problem in one sentence.
- ✓ I can explain my method without reading from the board.
- ✓ My data, graphs, and conclusion match each other.
- ✓ My logbook is organized and honest.
- ✓ My display follows size and safety rules.
- ✓ I practised answering judge questions.
- ✓ I can explain what I would improve next.

Ready to Start?

- ✓ Choose one idea you care about.
- ✓ Turn it into a testable question or design problem.
- ✓ Check safety and ethics before you begin.
- ✓ Start your logbook and use mySTEMspace.ca to organize your work.
- ✓ Practise explaining what you did, what you discovered, and why it matters.
- ✓ Check with <https://www.peelsciencefair.ca> for updates, deadlines and rules.
- ✓ Follow us on Instagram @peelsciencefair!