

2027

Quinte Regional Science and Technology Fair

Expo-sciences régionale de Quinte



2. Ontario Science and Technology Curriculum (2022)

Ontario's revised Science and Technology curriculum introduced a stronger emphasis on:

- STEM learning
- Inquiry-based investigations
- Engineering Design
- Coding
- Emerging technologies
- Artificial Intelligence
- Sustainability
- Skilled trades
- Career awareness
- Indigenous perspectives
- Real-world applications

A significant change was the introduction of **Strand A: STEM Skills and Connections**, which integrates scientific investigation and engineering design across every grade.

3. Direct Alignment Between Science Fairs and Ontario Curriculum

Ontario Curriculum Expectation Science Fair Connection

Scientific Research	Students identify research questions and review scientific literature.
Scientific Inquiry	Students design controlled experiments and collect evidence.
Engineering Design	Students design, prototype, test, and improve solutions.
Data Collection	Students gather quantitative and qualitative data.
Critical Thinking	Students interpret results and evaluate evidence.
Communication	Students create displays, reports, and oral presentations.
Coding	Students may use coding for data analysis, robotics, or simulations.
Emerging Technologies	Projects often involve AI, sensors, drones, or digital tools.
Environmental Stewardship	Many projects address climate, biodiversity, or conservation.
Career Exploration	Students engage with STEM professionals during judging.

These expectations are central to Strand A and are reinforced across all science content strands.

4. Ontario Strand A: STEM Skills and Connections

Science fairs naturally address the five major areas emphasized in Strand A.

A1. STEM Investigation and Communication Skills

Students:

- Ask investigable questions
- Conduct background research



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- Form hypotheses
- Design investigations
- Collect observations
- Analyze results
- Draw conclusions
- Communicate findings

Science fairs require students to complete each of these steps.

A2. Coding and Emerging Technologies

The curriculum now requires coding throughout Grades 1–8.

Science fair examples include:

- Programming robots
- Environmental monitoring systems
- AI image recognition
- Microcontrollers (Arduino, micro:bit)
- Python data analysis
- Sensor-based experiments

These projects directly support Ontario's expanded focus on coding and technology.

A3. Applications, Connections and Contributions

Students connect science to:

- Society
- Industry
- Technology
- Environmental issues
- Community needs
- Everyday life

Science fair projects often address:

- Water quality
- Renewable energy
- Climate change
- Public health
- Agriculture
- Accessibility technologies



5. Curriculum Alignment by Grade

Grades 1–3

Students learn to:

- Observe



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- Predict
- Compare
- Classify
- Measure
- Record observations

Science Fair Examples:

- Plant growth
- Floating and sinking
- Magnetism
- Weather observations
- Animal habitats

Skills developed:

- Observation
- Curiosity
- Recording data
- Oral communication

Grades 4–6

Students begin:

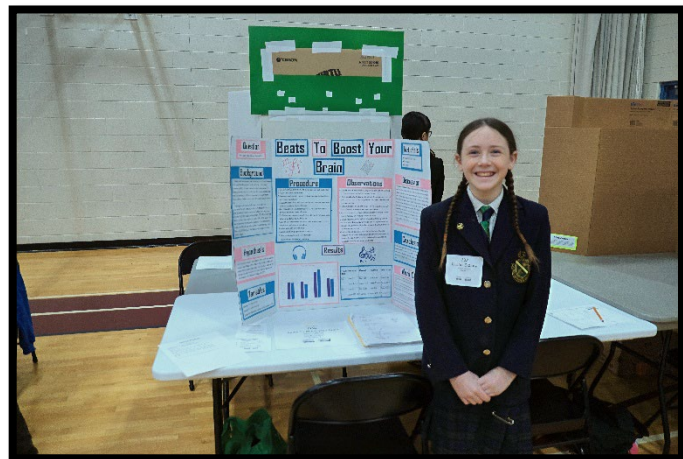
- Controlled experiments
- Fair testing
- Data tables
- Variables
- Engineering design

Science Fair Examples:

- Water filtration
- Renewable energy
- Flight
- Electricity
- Biodiversity
- Soil investigations

Skills developed:

- Experimental design
- Graphing
- Statistical thinking
- Prototype development



Grades 7–8

Students conduct more sophisticated investigations involving:

- Experimental controls
- Coding



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- Robotics
- Environmental systems
- Chemical reactions
- Human body systems

Science Fair Examples:

- AI applications
- Robotics
- Climate modelling
- Machine learning
- Water purification
- Sustainable engineering

Grade 9 (SNC1W)

The de-streamed Grade 9 Science course emphasizes:

- Biology
- Chemistry
- Physics
- Earth and Space Science
- STEM careers
- Engineering
- Scientific literacy

Science fair projects provide authentic opportunities to integrate these disciplines into a single investigation.

6. Engineering Design Process

The Ontario curriculum promotes the Engineering Design Process, which mirrors many engineering-focused science fair projects.

Engineering Design Science Fair Activity

Identify problem	Choose a real-world challenge
Research	Gather background information
Brainstorm	Generate possible solutions
Prototype	Build a model or device
Test	Evaluate performance
Improve	Refine the design
Share	Present findings

7. Scientific Inquiry Process



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Science fairs also reinforce the scientific method:

1. Ask a question
2. Conduct research
3. Develop a hypothesis
4. Design an experiment
5. Collect data
6. Analyze results
7. Draw conclusions
8. Communicate findings

This closely matches Ontario's expectations for scientific investigation.

8. Cross-Curricular Learning

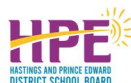
Science fairs integrate learning across multiple subject areas.

Subject	Connection
Science	Inquiry and experimentation
Mathematics	Measurement, statistics, graphing
Language	Research, technical writing, presentations
Computer Studies	Coding, programming, AI
Technological Education	Design and fabrication
Geography	Environmental investigations
Business	Entrepreneurship and innovation
Arts	Poster and visual communication design

9. Transferable Skills Developed

Science fairs foster skills identified in the Ontario curriculum, including:

- Critical thinking
- Creative thinking
- Innovation
- Collaboration
- Problem solving
- Research literacy
- Digital literacy
- Information literacy
- Communication
- Project management
- Time management
- Ethical decision-making
- Leadership



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- Perseverance
- Scientific literacy

The revised curriculum highlights these transferable skills as essential for future learning, careers, and citizenship.

10. Assessment and Evaluation

Science fair participation supports assessment across the Ontario Achievement Chart categories:

Achievement Category	Science Fair Evidence
Knowledge and Understanding	Demonstrates scientific concepts
Thinking	Investigation, analysis, problem solving
Communication	Oral presentation, display board, written report
Application	Real-world solutions and engineering design

11. Career Exploration

Science fairs expose students to STEM pathways in:

- Medicine
- Engineering
- Artificial Intelligence
- Computer Science
- Biotechnology
- Environmental Science
- Agriculture
- Space Science
- Skilled Trades
- Renewable Energy

Interaction with volunteer judges from universities, research institutes, government, and industry helps students connect classroom learning to future careers.

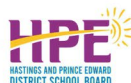
12. Benefits for Ontario Schools

Science fairs support school improvement goals by promoting:

- Inquiry-based learning
- Hands-on STEM education
- Student engagement
- Experiential learning
- Inclusive participation
- Innovation and creativity
- Community partnerships
- Environmental stewardship



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- Digital competencies
- Scientific communication

Conclusion

Science fairs are not extracurricular activities alone—they are authentic demonstrations of the competencies expected in the Ontario Science and Technology Curriculum. Through scientific research, experimentation, engineering design, coding, data analysis, and communication, students meet many of the curriculum's overall expectations while developing transferable skills needed for post-secondary education, the skilled trades, and STEM careers. The 2022 curriculum's introduction of **Strand A: STEM Skills and Connections** makes science fairs especially well suited as a culminating, inquiry-based learning experience that integrates science with mathematics, technology, language, and real-world problem solving.

