

# Science & Technology Curriculum, 2022

Grades 1-8 and  
Grade 9 De-Streamed Science

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# Land Acknowledgement

We acknowledge we are hosted on the lands of the Mississaugas of the Anishinaabe, the Haudenosaunee Confederacy and the Wendat. We also recognise the enduring presence of all First Nations, Métis and Inuit peoples.



# New Science & Technology Curriculum

- Beginning September 2022
- Designed to support foundational and transferable skills
- Ongoing focus on STEM and skilled trades
- Last updated in 2007 (Elem) & 2008  
(gr 9/10)

# Importance of STEM Education

STEM education is the *cross-curricular study* of science, technology, engineering, and mathematics, and the application of those subjects in real-world contexts.



# Minds On Activity

What does STEM mean to you?

- Take a minute and share your thoughts in the chat.



# Centering Equity

*“Diverse perspectives engage students in a variety of creative and critical thinking processes that are essential for developing innovative, ethical, and effective solutions to societal and environmental problems.”*



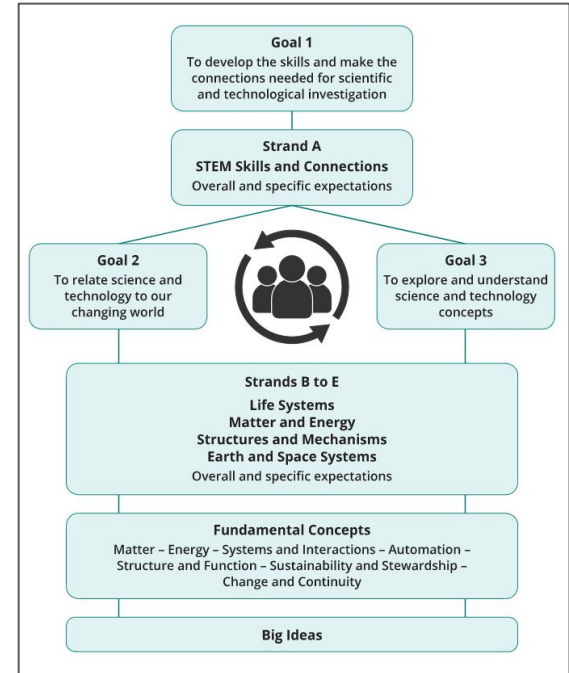
# Curiosity and Wonder in Science and Technology



- **Curiosity** and **wonder** are at the core of science and technology disciplines and should be at the **core** of a **student-centred science** and **technology** education.
  - Students' curiosity may be expressed explicitly, with direct questions, such as "How does that work?", or expressed subtly as they consider the results of an experiment or the results of testing an engineered design.
  - Wonder is exhibited as students are surprised at the results of their research, experimentation, or engineered design, or as they admire the natural processes that make up our world.

# Fundamental Concepts and Big Ideas

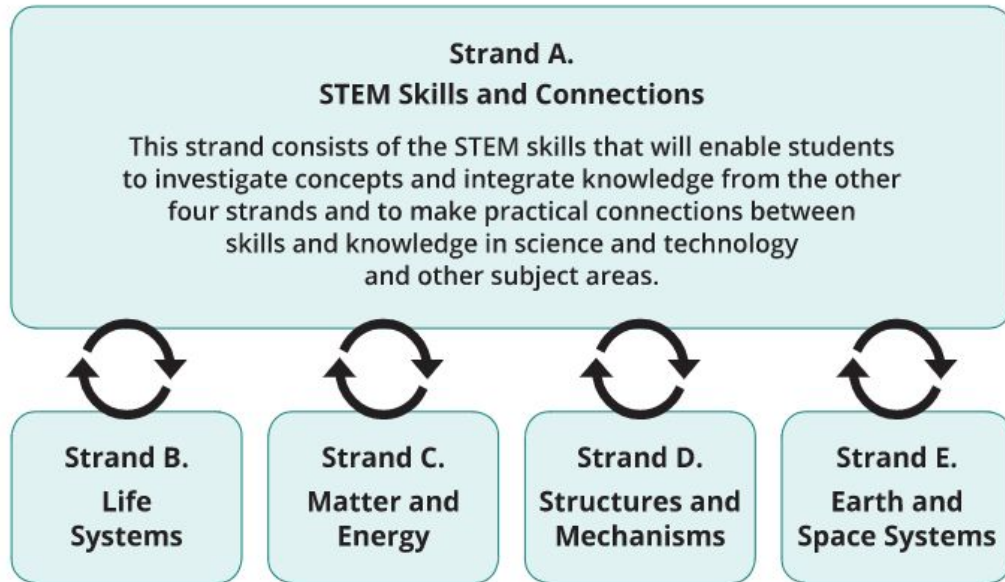
Developing an understanding of the big ideas requires students to consider and apply STEM skills as they engage in investigative processes and make connections between related science and technology concepts, between science and technology and other disciplines, and between science and technology and everyday life.



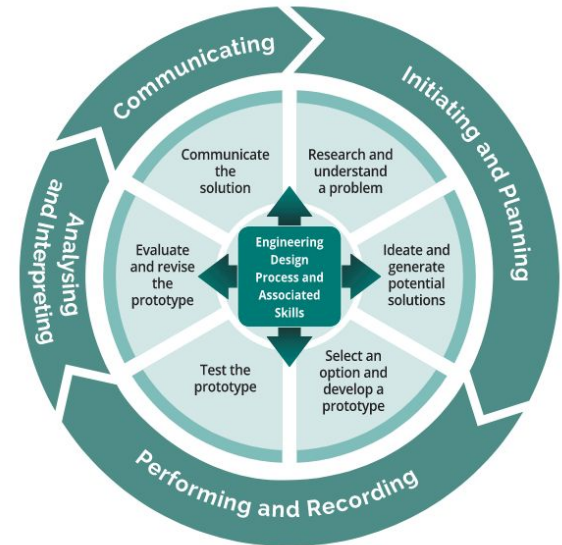
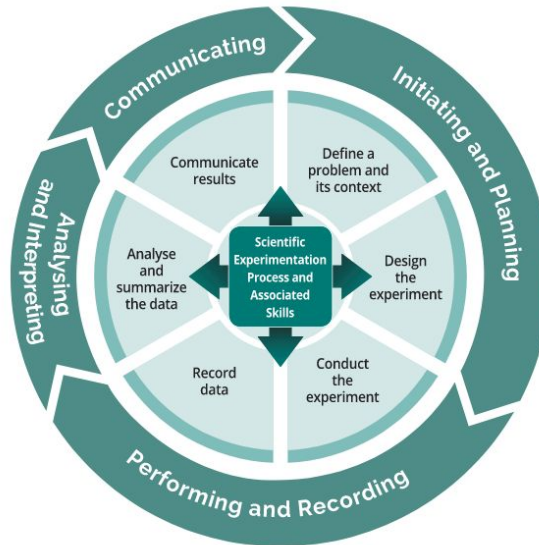
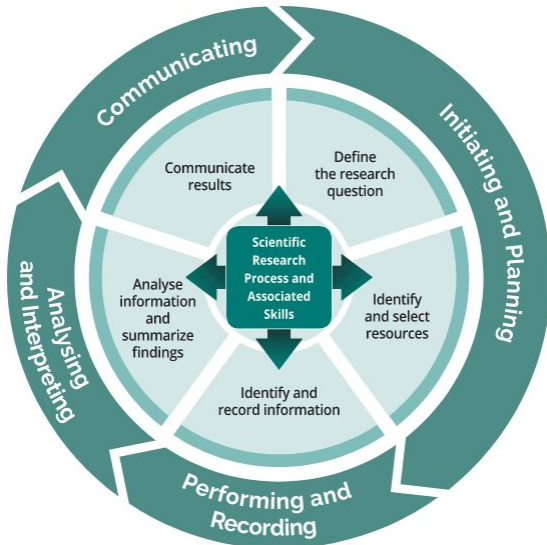


# Strand A & Scientific and Engineer Design Process

- Think of as an overlay on all the other strands



# Scientific and Engineering Design Processes



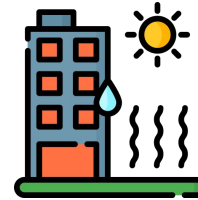
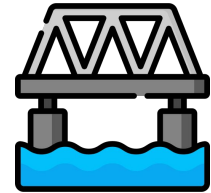
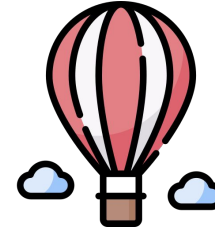
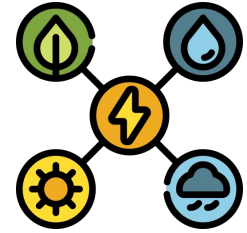
# Elem. Strands B, C, D & E

**Strand B** - Life Systems

**Strand C** - Matter and Energy

**Strand D** - Structures and Mechanisms

**Strand E** - Earth and Space Systems



# New Areas of Learning

- The key changes reflect new areas of learning that include:
  - Indigenous knowledge and perspectives
  - food literacy
  - coding
  - climate change
  - contributions to science and technology

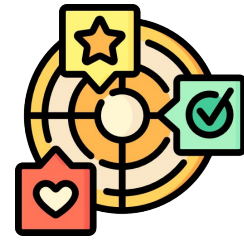


# Grade 9 De-streamed Science

- A focus on the importance of STEM education and fostering curiosity and wonder in science
- Investigation in science using scientific research and experimentation processes, and engineering design process
- Supporting new learning on coding, the impacts of emerging technology, skilled trades, and climate change



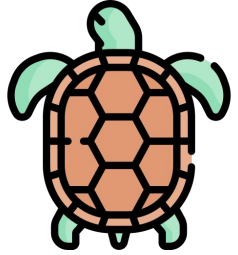
# Vision & Goals



The three ***main goals*** of the curriculum are for students:

1. to develop the skills and make the connections needed for scientific and technological investigation
2. to relate science and technology to our changing world, including society, the economy, and the environment
3. to explore and understand science and technology concepts

# Indigenous knowledge and perspectives



- Curriculum expectations related to exploring Indigenous knowledges and ways of knowing can create opportunities for inclusive and impactful integrative studies.

## Example

- **Grade 5 E1.3:** *analyse how First Nations, Métis, and Inuit communities use their knowledges and ways of knowing to conserve energy and resources*

# Food Literacy



- Food literacy involves:
  - not only where food comes from
  - also the interrelationships between food and the environment, the economy, our society, and diverse cultures.
- Food literacy has connections to:
  - climate change,
  - biodiversity, and
  - relationships with the land and ecosystems,
  - including varying perspectives on foods and plants within First Nations, Métis, and Inuit contexts



# Coding



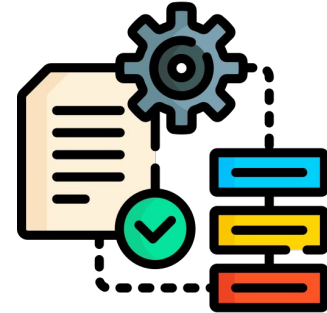
- **In Grades 1 to 3:** learn foundational concepts and practices that will allow them to successfully approach coding activities in science and technology, as well as in mathematics and other subjects. These concepts and practices include the creation of clear and precise algorithms; decomposing problems into smaller steps; and testing, debugging, and refining programs.
- **In Grade 4 to 6:** physical computing context, which can include components such as motors, sensors, and microcontrollers, can provide a valuable context for this learning, or students can explore these concepts and associated skills by developing programs without external, physical components.

# Coding



- **In Grades 7:** effective ways to use coding to plan, design, and implement projects
- **In Grades 8:** students combine the skills developed in the previous grades, as they design and implement a larger, automated system in action.

**In grade 9:** use coding to investigate and model scientific concepts and relationships.



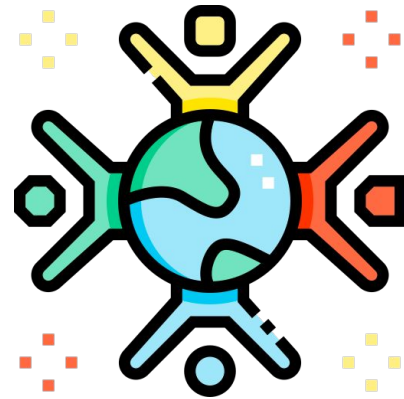
# Climate Change



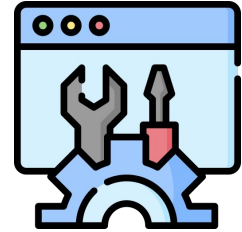
- Important to also foster hope and optimism in teaching and learning about climate change and other environmental issues.
- Develop skills and knowledge needed to understand the causes and potential innovative solutions and mitigation strategies related to climate change and other environmental issues
- How they can make the most environmentally responsible decisions possible, given the choices they have.

# Contributions to Science

- Diverse perspectives engage students in a variety of creative and critical thinking processes that are essential for developing innovative, ethical, and effective solutions to societal and environmental problems.



# Skilled Trades



- A number of concepts and skills in the science and technology curriculum relate directly to the skilled trades.
- A skilled trade is a career path that requires hands-on work and specialty knowledge.
- Engage in experiential learning opportunities that connect students with role models with diverse lived experiences.
- Classroom presentations given by guest speakers from under-represented populations, such as women engaged in the skilled trades, may provide an excellent opportunity to do so.

# Connections Between Home and School Elem

Here are some ways to spark your child's curiosity:

- look for examples, such as how tools and other technologies make our lives easier and help us discover how things work
- go on nature walks and discover plants and animals
- observe the changing seasons and weather patterns
- talk with your child about how science can support their health and well-being
- look for buildings and machines to explore and discuss wherever you find them – when driving, passing farms or factories, or taking public transit
- explore career opportunities that rely on science and technology skills and look for role models

# Connections between Home and School Sec

- Discuss science news items and what is happening in your community.
- Discuss the importance of thinking critically about how science is presented in social media.
- Discuss strengths and interests and help them look ahead and set education and career goals. Make connections between what they learn in school and the courses they chose to take.
- Help your child make connections between what they learn in school, their interests or passions, and the courses they choose to take and connect guidance.
- Discuss how science makes a difference in your own work and in your everyday life.

# Where to find supports

Curriculum documents and Ministry supports:

Elementary

- [Science and Technology \(2022\)](#)
- [Parents' Guide](#)

Secondary

- [Grade 9 Destreamed Science Course \(2022\)](#)
- [Parent's Guide](#)