Halton District School Board

I-STEM PROGRAM
YEAR 1

ENGINEERING

In their Grade 9 year, students will develop their Engineer's Toolkit. With an emphasis on the design thinking process, development of innovation skills and engineering design, I-STEM students will use their creativity to analyze, invent, design and build things that matter.

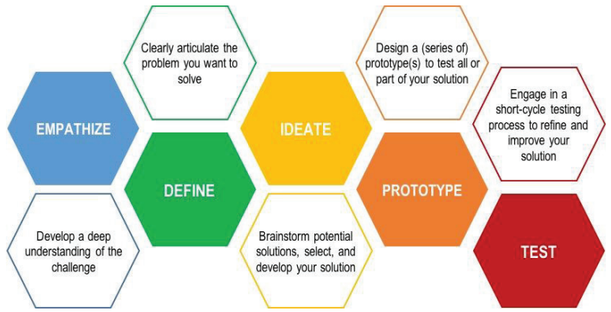
In addition to learning the curriculum of Grade 9 Science, Technology, Geography and Mathematics, students will further develop the following skills to add to their Engineer's Toolkit:

Collaboration	Project Management
Design Thinking	Teamwork
Learning with Technology	Technical Drawings
Presentation and Communication	Understanding Diversity
Professionalism	Writing for an Audience

I-STEM students will connect with and be mentored by professional engineers who will give them the confidence to prototype, test, fail, learn and try again!

Students will research, reflect and refine their designs while solving real world problems. In June, students will be implementing an engineering challenge of their own design, which will be showcased at a public exhibition.

DESIGN THINKING PROCESS



Source: d.school, Stanford University

Innovation • Science • Technology • Engineering • Mathematics

I-STEM

ENGINEER'S TOOLKIT

Students will explore and develop innovation skills related to engineering design and design thinking. Engineers use their creativity and analytical skills to invent, design, and build things that matter.

The design thinking process brings the lens of human-centred design to solving real world problems. These design processes will enable students to further develop mindsets that include creativity, critical thinking and project management.

I-STEM ROADMAP - YEAR 1

WEEKS 1-2

WELCOME TO I-STEM

A two week mini-build project will serve as an introduction to Design Thinking. Students will develop an interdisciplinary understanding of how engineers approach human-centred problems.

ENGINEER'S TOOLKIT

- Collaboration
- Design Thinking
- Teamwork

WEEKS 3-6

PROTOTYPING

Students will learn how to use prototyping to test and improve their own designs by iterating on their design challenges and failures.

ENGINEER'S TOOLKIT

- Design Thinking
- Teamwork
- Technical Drawings

WEEKS 7-10

INVESTIGATING A LOCAL ISSUE
PART 1

By networking with community partners, students will identify a local issue. Students will collect data, research the global and local impact of the issue and propose a variety of solutions to the community partner.

ENGINEER'S TOOLKIT

- Project Management
- Understanding Diversity
- Writing for an Audience

WEEKS 11-12

ENGINEERING DESIGN CHALLENGE
PART 1

Students will follow a process that engineers employ to address a problem. The solution involves designing a product that meets identified criteria and/or accomplishes a certain task.

ENGINEER'S TOOLKIT

- Design Thinking
- Professionalism
- Technical Drawings

WEEKS 13-16

INVESTIGATING A LOCAL ISSUE
PART 2

Students will continue to act locally to solve various environmental issues. Students will build on their project management skills to create a product that addresses a local environmental issue.

ENGINEER'S TOOLKIT

- Collaboration
- Learning with Technology
- Project Management

WEEKS 17-20

ENGINEERING DESIGN CHALLENGE
PART 2

Students will finalize their work on the Engineering Design Challenge by presenting their solutions to I-STEM Faculty, community partners and parents.

ENGINEER'S TOOLKIT

- Presentation and Communication
- Professionalism
- Writing for an Audience

WEEKS 21-22

LEADERSHIP DEVELOPMENT

Students will organize, run and participate in an I-STEM Symposium, that will expose students to potential educational and career pathways in STEM fields.

ENGINEER'S TOOLKIT

- Collaboration
- Professionalism
- Teamwork

WEEKS 23-26

UN SUSTAINABLE DEVLOPMENT GOALS

The UN Sustainable Development Goals will be an I-STEM focus in Grade 11/12. In Grade 9, students will be introduced to the 17 Global Goals and, through this lens, work to address a global issue.

ENGINEER'S TOOLKIT

- Understanding Diversity
- Teamwork
- Writing for an Audience

WEEKS 27-30

EMERGING TECHNOLOGIES

By seeking to understand emerging technologies, such as renewable energy, nanotechnology, biotechnology or artificial intelligence, students will broaden their knowledge of disruptive innovations.

ENGINEER'S TOOLKIT

- Learning with Technology
- Project Management
- Technical Drawings

WEEKS 31-32

INNOVATION PROJECT
PART 1

With an emphasis on the design thinking process, development of innovation skills and engineering design, students will apply their learning to analyze, invent, design and build things that matter in a project of their choice.

ENGINEER'S TOOLKIT

- Design Thinking
- Professionalism
- Project Management

WEEKS 33-35

SUSTAINABILITY

The "Sustainability" theme will be the consolidation of the learning throughout the year. Students will complete a design challenge including a public exhibition of their learning.

ENGINEER'S TOOLKIT

- Collaboration
- Design Thinking
- Project Management

WEEKS 36-40

INNOVATION PROJECT
PART 2

Students will continue to seek feedback on their design, product and/or presentation from I-STEM mentors and advisors. Students will end the year by presenting their Innovation Project.

ENGINEER'S TOOLKIT

- Collaboration
- Design Thinking
- Learning with Technology
- Presentation and Communication
- Project Management
- Professionalism
- Teamwork
- Technical Drawings
- Understanding Diversity
- Writing for an Audience