Main Criteria: Forward Education

Secondary Criteria: Alberta Programs of Study, British Columbia Curriculum, Manitoba Curriculum Frameworks, New Brunswick Curriculum, Newfoundland and Labrador Curriculum Guides, Northern Territory Curriculum, Nova Scotia Curriculum, The Ontario Curriculum, Prince Edward Island Curriculum, Québec Education Program Progression of Learning, Programme de formation de l'école québécoise - Progression des apprentissages, Saskatchewan Curriculum

Subjects: Mathematics, Science, Technology Education

Grades: 7, 8

Forward Education

Harnessing the Sun's Energy with Solar Panels

Alberta Programs of Study

Mathematics

Grade **7** - Adopted: **2007/Updated 2016**

GENERAL OUTCOME / COURSE	AB.MP.	Mathematical Processes
GENERAL OUTCOME / SPECIFIC OUTCOME	[PS]	Problem Solving: Students are expected to develop and apply new mathematical knowledge through problem solving
GENERAL OUTCOME / SPECIFIC OUTCOME	[R]	Reasoning: Students are expected to develop mathematical reasoning
GENERAL OUTCOME / SPECIFIC OUTCOME	[V]	Visualization: Students are expected to develop visualization skills to assist in processing information, making connections and solving problems.

Alberta Programs of Study

Mathematics

Grade **8** - Adopted: **2007/Updated 2016**

GENERAL OUTCOME / COURSE	AB.MP.	Mathematical Processes
GENERAL OUTCOME / SPECIFIC OUTCOME	[PS]	Problem Solving: Students are expected to develop and apply new mathematical knowledge through problem solving
GENERAL OUTCOME / SPECIFIC OUTCOME	[R]	Reasoning: Students are expected to develop mathematical reasoning
GENERAL OUTCOME / SPECIFIC OUTCOME	[V]	Visualization: Students are expected to develop visualization skills to assist in processing information, making connections and solving problems.

Alberta Programs of Study

Science

Grade **7** - Adopted: **2014**

GENERAL OUTCOME / COURSE	**AB.7.A.**	**Unit A: Interactions and Ecosystems (Social and Environmental Emphasis)**
GENERAL OUTCOME / SPECIFIC OUTCOME	**7.A.STS.**	**Outcomes for Science, Technology and Society (STS) and Knowledge - Students will:**
SPECIFIC OUTCOME / ILLUSTRATIVE EXAMPLE	**7.A.STS.1.**	**Investigate and describe relationships between humans and their environments, and identify related issues and scientific questions**
ILLUSTRATIVE EXAMPLE	7.A.STS.1.4.	Analyze personal and public decisions that involve consideration of environmental impacts, and identify needs for scientific knowledge that can inform those decisions

GENERAL OUTCOME / COURSE	**AB.7.C.**	**Unit C: Heat and Temperature (Social and Environmental Emphasis)**
GENERAL OUTCOME / SPECIFIC OUTCOME	**7.C.STS.**	**Outcomes for Science, Technology and Society (STS) and Knowledge - Students will:**
SPECIFIC OUTCOME / ILLUSTRATIVE EXAMPLE	**7.C.STS.1.**	**Illustrate and explain how human needs have led to technologies for obtaining and controlling thermal energy and to increased use of energy resources**
ILLUSTRATIVE EXAMPLE	7.C.STS.1.4.	Identify examples of personal and societal choices in using energy resources and technology (e.g., identify choices that affect the amount of hot water used in their daily routines; identify choices in how that water is heated)

GENERAL OUTCOME / COURSE	**AB.7.C.**	**Unit C: Heat and Temperature (Social and Environmental Emphasis)**
GENERAL OUTCOME / SPECIFIC OUTCOME	**7.C.STS.**	**Outcomes for Science, Technology and Society (STS) and Knowledge - Students will:**
SPECIFIC OUTCOME / ILLUSTRATIVE EXAMPLE	**7.C.STS.3.**	**Apply an understanding of heat and temperature in interpreting natural phenomena and technological devices**
ILLUSTRATIVE EXAMPLE	7.C.STS.3.2.	Describe examples of passive and active solar heating, and explain the principles that underlie them (e.g., design of homes to maximize use of winter sunshine)

GENERAL OUTCOME / COURSE	**AB.7.C.**	**Unit C: Heat and Temperature (Social and Environmental Emphasis)**
GENERAL OUTCOME / SPECIFIC OUTCOME	**7.C.STS.**	**Outcomes for Science, Technology and Society (STS) and Knowledge - Students will:**
SPECIFIC OUTCOME / ILLUSTRATIVE EXAMPLE	**7.C.STS.4.**	**Analyze issues related to the selection and use of thermal technologies, and explain decisions in terms of advantages and disadvantages for sustainability**
ILLUSTRATIVE EXAMPLE	7.C.STS.4.3.	Identify positive and negative consequences of energy use, and describe examples of energy conservation in their home or community

GENERAL OUTCOME / COURSE	**AB.7.C.**	**Unit C: Heat and Temperature (Social and Environmental Emphasis)**
GENERAL OUTCOME / SPECIFIC OUTCOME	**7.C.SO.**	**Skill Outcomes (focus on the use of research and inquiry skills to inform the decision-making process)**
SPECIFIC OUTCOME / ILLUSTRATIVE EXAMPLE	**7.C.SO.AI.**	**Analyzing and Interpreting - Students will:**
ILLUSTRATIVE EXAMPLE	**7.C.SO.AI.1.**	**Analyze qualitative and quantitative data, and develop and assess possible explanations**
EXPECTATION	7.C.SO.AI.1.4.	Test the design of a constructed device or system (e.g., test a personally-constructed heating or cooling device)

British Columbia Curriculum

Mathematics

Grade **7** - Adopted: **2016**

CURRICULUM ORGANIZER / COURSE	**BC.MA.7.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following:**
EXPECTATION / SUB ORGANIZER	**7.CC.1.**	**Reasoning and analyzing**
PRESCRIBED LEARNING OUTCOME	7.CC.1.1.	Use logic and patterns to solve puzzles and play games
PRESCRIBED LEARNING OUTCOME	7.CC.1.2.	Use reasoning and logic to explore, analyze, and apply mathematical ideas
PRESCRIBED LEARNING OUTCOME	7.CC.1.6.	Model mathematics in contextualized experiences

CURRICULUM ORGANIZER / COURSE	**BC.MA.7.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following:**
EXPECTATION / SUB ORGANIZER	**7.CC.2.**	**Understanding and solving**
PRESCRIBED LEARNING OUTCOME	7.CC.2.1.	Apply multiple strategies to solve problems in both abstract and contextualized situations

PRESCRIBED LEARNING OUTCOME	7.CC.2.2.	Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
PRESCRIBED LEARNING OUTCOME	7.CC.2.3.	Visualize to explore mathematical concepts
PRESCRIBED LEARNING OUTCOME	7.CC.2.4.	Engage in problem-solving experiences that are connected to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures

CURRICULUM ORGANIZER / COURSE	**BC.MA.7.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following:**
EXPECTATION / SUB ORGANIZER	**7.CC.3.**	**Communicating and representing**
PRESCRIBED LEARNING OUTCOME	7.CC.3.2.	Explain and justify mathematical ideas and decisions
PRESCRIBED LEARNING OUTCOME	7.CC.3.3.	Communicate mathematical thinking in many ways

CURRICULUM ORGANIZER / COURSE	**BC.MA.7.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following:**
EXPECTATION / SUB ORGANIZER	**7.CC.4.**	**Connecting and reflecting**
PRESCRIBED LEARNING OUTCOME	7.CC.4.1.	Reflect on mathematical thinking
PRESCRIBED LEARNING OUTCOME	7.CC.4.2.	Connect mathematical concepts to each other and to other areas and personal interests

British Columbia Curriculum

Mathematics

Grade **8** - Adopted: **2016**

CURRICULUM ORGANIZER / COURSE	**BC.MA.8.CC.**	**Curricular Competencies**

PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following:**
EXPECTATION / SUB ORGANIZER	**8.CC.1.**	**Reasoning and analyzing**
PRESCRIBED LEARNING OUTCOME	8.CC.1.1.	Use logic and patterns to solve puzzles and play games
PRESCRIBED LEARNING OUTCOME	8.CC.1.2.	Use reasoning and logic to explore, analyze, and apply mathematical ideas
PRESCRIBED LEARNING OUTCOME	8.CC.1.6.	Model mathematics in contextualized experiences

CURRICULUM ORGANIZER / COURSE	**BC.MA.8.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following:**
EXPECTATION / SUB ORGANIZER	**8.CC.2.**	**Understanding and solving**
PRESCRIBED LEARNING OUTCOME	8.CC.2.1.	Apply multiple strategies to solve problems in both abstract and contextualized situations
PRESCRIBED LEARNING OUTCOME	8.CC.2.2.	Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
PRESCRIBED LEARNING OUTCOME	8.CC.2.3.	Visualize to explore mathematical concepts
PRESCRIBED LEARNING OUTCOME	8.CC.2.4.	Engage in problem-solving experiences that are connected to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures

CURRICULUM ORGANIZER / COURSE	**BC.MA.8.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following:**
EXPECTATION / SUB ORGANIZER	**8.CC.3.**	**Communicating and representing**

PRESCRIBED LEARNING OUTCOME	8.CC.3.2.	Explain and justify mathematical ideas and decisions
PRESCRIBED LEARNING OUTCOME	8.CC.3.3.	Communicate mathematical thinking in many ways
CURRICULUM ORGANIZER / COURSE	**BC.MA.8.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following:**
EXPECTATION / SUB ORGANIZER	**8.CC.4.**	**Connecting and reflecting**
PRESCRIBED LEARNING OUTCOME	8.CC.4.1.	Reflect on mathematical thinking
PRESCRIBED LEARNING OUTCOME	8.CC.4.2.	Connect mathematical concepts to each other and to other areas and personal interests

British Columbia Curriculum

Science

Grade **7** - Adopted: **2016**

CURRICULUM ORGANIZER / COURSE	**BC.SC.7.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following**
EXPECTATION / SUB ORGANIZER	**7.CC.2.**	**Planning and conducting**
PRESCRIBED LEARNING OUTCOME	7.CC.2.3.	Observe, measure, and record data (qualitative and quantitative), using equipment, including digital technologies, with accuracy and precision
CURRICULUM ORGANIZER / COURSE	**BC.SC.7.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following**
EXPECTATION / SUB ORGANIZER	**7.CC.5.**	**Applying and innovating**
PRESCRIBED LEARNING OUTCOME	7.CC.5.1.	Contribute to care for self, others, community, and world through personal or collaborative approaches

PRESCRIBED LEARNING OUTCOME	7.CC.5.2.	Co-operatively design projects
PRESCRIBED LEARNING OUTCOME	7.CC.5.3.	Transfer and apply learning to new situations
PRESCRIBED LEARNING OUTCOME	7.CC.5.4.	Generate and introduce new or refined ideas when problem solving
CURRICULUM ORGANIZER / COURSE	**BC.SC.7.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following**
EXPECTATION / SUB ORGANIZER	**7.CC.6.**	**Communicating**
PRESCRIBED LEARNING OUTCOME	7.CC.6.1.	Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate
CURRICULUM ORGANIZER / COURSE	**BC.SC.7.C.**	**Content**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to know the following**
EXPECTATION / SUB ORGANIZER	**7.C.7.**	**Electricity**
PRESCRIBED LEARNING OUTCOME	7.C.7.1.	Generated in different ways with different environmental impacts

British Columbia Curriculum

Science

Grade **8** - Adopted: **2016**

CURRICULUM ORGANIZER / COURSE	**BC.SC.8.CC.**	**Curricular Competencies**
PRESCRIBED LEARNING OUTCOME / ORGANIZER		**Students are expected to be able to do the following:**
EXPECTATION / SUB ORGANIZER	**8.CC.2.**	**Planning and conducting**
PRESCRIBED LEARNING OUTCOME	8.CC.2.3.	Observe, measure, and record data (qualitative and quantitative), using equipment, including digital technologies, with accuracy and precision

CURRICULUM ORGANIZER / COURSE	BC.SC.8.CC.	Curricular Competencies
PRESCRIBED LEARNING OUTCOME / ORGANIZER		Students are expected to be able to do the following:
EXPECTATION / SUB ORGANIZER	8.CC.5.	Applying and innovating
PRESCRIBED LEARNING OUTCOME	8.CC.5.1.	Contribute to care for self, others, community, and world through personal or collaborative approaches
PRESCRIBED LEARNING OUTCOME	8.CC.5.2.	Co-operatively design projects
PRESCRIBED LEARNING OUTCOME	8.CC.5.3.	Transfer and apply learning to new situations
PRESCRIBED LEARNING OUTCOME	8.CC.5.4.	Generate and introduce new or refined ideas when problem solving

CURRICULUM ORGANIZER / COURSE	BC.SC.8.CC.	Curricular Competencies
PRESCRIBED LEARNING OUTCOME / ORGANIZER		Students are expected to be able to do the following:
EXPECTATION / SUB ORGANIZER	8.CC.6.	Communicating
PRESCRIBED LEARNING OUTCOME	8.CC.6.1.	Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate

Manitoba Curriculum Frameworks

Science

Grade **7** - Adopted: **2006**

STRAND / COURSE / GENERAL OUTCOME	MB.GLO-A.	Foundation A: Nature of Science and Technology
STRAND / SPECIFIC OUTCOME	GLO-A3.	Distinguish critically between science and technology in terms of their respective contexts, goals, methods, products, and values
STRAND / SPECIFIC OUTCOME	GLO-A5.	Recognize that science and technology interact with and advance one another

STRAND / COURSE / GENERAL OUTCOME	**MB.GLO-B.**	**Foundation B: Science, Technology, Society, and Environment (STSE)**
STRAND / SPECIFIC OUTCOME	GLO-B1.	Describe scientific and technological developments, past and present, and appreciate their impact on individuals, societies and the environment, both locally and globally.
STRAND / SPECIFIC OUTCOME	GLO-B2.	Recognize that scientific and technological endeavors have been and continue to be influenced by human needs and the societal context of the time
STRAND / SPECIFIC OUTCOME	GLO-B5.	Identify and demonstrate actions that promote a sustainable environment, society and economy, both locally and globally
STRAND / COURSE / GENERAL OUTCOME	**MB.GLO-C.**	**Foundation C: Scientific and Technological Skills and Attitudes**
STRAND / SPECIFIC OUTCOME	GLO-C3.	Demonstrate appropriate problem-solving skills while seeking solutions to technological challenges
STRAND / SPECIFIC OUTCOME	GLO-C4.	Demonstrate appropriate critical thinking and decision-making skills when choosing a course of action based on scientific and technological information
STRAND / SPECIFIC OUTCOME	GLO-C5.	Demonstrate curiosity, scepticism, creativity, open-mindedness, accuracy, precision, honesty, and persistence, and appreciate their importance as scientific and technological habits of mind
STRAND / SPECIFIC OUTCOME	GLO-C6.	Employ effective communication skills and utilize information technology to gather and share scientific and technological ideas and data
STRAND / COURSE / GENERAL OUTCOME	**MB.GLO-D.**	**Foundation D: Essential Science Knowledge**
STRAND / SPECIFIC OUTCOME	GLO-D4.	Understand how stability, motion, forces, and energy transfers and transformations play a role in a wide range of natural and constructed contexts
STRAND / COURSE / GENERAL OUTCOME	**MB.GLO-E.**	**Foundation E: Unifying Concepts**
STRAND / SPECIFIC OUTCOME	GLO-E4.	Recognize that energy, whether transmitted or transformed, is the driving force of both movement and change, and is inherent within materials and in the interactions among them

STRAND / COURSE / GENERAL OUTCOME	MB.7-0.	Overall Skills and Attitudes - Specific Learning Outcomes
STRAND / SPECIFIC OUTCOME	**7-0-1.**	**Initiating**
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-1b.	Select and justify a method to be used in finding the answer to a specific question. (GLO: C2)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-1c.	Identify practical problems to solve. (GLO: C3)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-1d.	Select and justify a method to be used in finding a solution to a practical problem. (GLO: C3)

STRAND / COURSE / GENERAL OUTCOME	MB.7-0.	Overall Skills and Attitudes - Specific Learning Outcomes
STRAND / SPECIFIC OUTCOME	**7-0-3.**	**Planning**
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-3d.	Develop criteria to evaluate a prototype or consumer product. (GLO: C3)

STRAND / COURSE / GENERAL OUTCOME	MB.7-0.	Overall Skills and Attitudes - Specific Learning Outcomes
STRAND / SPECIFIC OUTCOME	**7-0-4.**	**Implementing a Plan**
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-4b.	Construct a prototype. (GLO: C3)

STRAND / COURSE / GENERAL OUTCOME	MB.7-0.	Overall Skills and Attitudes - Specific Learning Outcomes
STRAND / SPECIFIC OUTCOME	**7-0-5.**	**Observing, Measuring, Recording**

GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-5b.	Test a prototype or consumer product with respect to pre-determined criteria. (GLO: C3, C5)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-5c.	Select and use tools to observe, measure, and construct. (GLO: C2, C3, C5)
STRAND / COURSE / GENERAL OUTCOME	**MB.7-0.**	**Overall Skills and Attitudes - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	**7-0-6.**	**Analysing and Interpreting**
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-6d.	Identify and make improvements to a prototype and explain the rationale for the changes. (GLO: C3, C4)
STRAND / COURSE / GENERAL OUTCOME	**MB.7-0.**	**Overall Skills and Attitudes - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	**7-0-7.**	**Concluding and Applying**
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-7e.	Identify new practical problems to solve. (GLO: C3)
STRAND / COURSE / GENERAL OUTCOME	**MB.7-0.**	**Overall Skills and Attitudes - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	**7-0-8.**	**Reflecting on Science and Technology**
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-8b.	Describe examples of how scientific knowledge has evolved in light of new evidence, and the role of technology in this evolution. (GLO: A2, A5, B1)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-8d.	Describe examples of how technologies have evolved over time in response to changing needs and scientific advances. (GLO: A5, B1, B2)

GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-8g.	Discuss societal, environmental, and economic impacts of scientific and technological endeavours. (GLO: A1, B1, B3, B5)
STRAND / COURSE / GENERAL OUTCOME	**MB.7-0.**	**Overall Skills and Attitudes - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	**7-0-9.**	**Demonstrating Scientific and Technological Attitudes**
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-9d.	Value skepticism, accuracy, precision, and open-mindedness as scientific and technological habits of mind. (GLO: C5)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-9e.	Be sensitive and responsible in maintaining a balance between the needs of humans and a sustainable environment. (GLO: B5)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	7-0-9f.	Consider the cause and effects relationships of actions and decisions. (GLO: B5, C4, E3)
STRAND / COURSE / GENERAL OUTCOME	**MB.7-1.**	**Interactions Within Ecosystems - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	7-1-10.	Analyze, using ecological pyramids, the implications of the loss of producers and consumers to the transfer of energy within an ecosystem. (GLO: C2, C8, D2, E4)
STRAND / COURSE / GENERAL OUTCOME	**MB.7-4.**	**Earth's Crust - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	7-4-06.	Identify geologic resources that are used by humans as sources of energy, and describe their method of formation. (GLO: D4, D5, E3)

Manitoba Curriculum Frameworks

Science

Grade **8** - Adopted: **2006**

STRAND / COURSE / GENERAL OUTCOME	**MB.GLO-A.**	**Foundation A: Nature of Science and Technology**

STRAND / SPECIFIC OUTCOME	GLO-A3.	Distinguish critically between science and technology in terms of their respective contexts, goals, methods, products, and values
STRAND / SPECIFIC OUTCOME	GLO-A5.	Recognize that science and technology interact with and advance one another
STRAND / COURSE / GENERAL OUTCOME	**MB.GLO-B.**	**Foundation B: Science, Technology, Society, and Environment (STSE)**
STRAND / SPECIFIC OUTCOME	GLO-B1.	Describe scientific and technological developments, past and present, and appreciate their impact on individuals, societies and the environment, both locally and globally.
STRAND / SPECIFIC OUTCOME	GLO-B2.	Recognize that scientific and technological endeavors have been and continue to be influenced by human needs and the societal context of the time
STRAND / SPECIFIC OUTCOME	GLO-B5.	Identify and demonstrate actions that promote a sustainable environment, society and economy, both locally and globally
STRAND / COURSE / GENERAL OUTCOME	**MB.GLO-C.**	**Foundation C: Scientific and Technological Skills and Attitudes**
STRAND / SPECIFIC OUTCOME	GLO-C3.	Demonstrate appropriate problem-solving skills while seeking solutions to technological challenges
STRAND / SPECIFIC OUTCOME	GLO-C4.	Demonstrate appropriate critical thinking and decision-making skills when choosing a course of action based on scientific and technological information
STRAND / SPECIFIC OUTCOME	GLO-C5.	Demonstrate curiosity, scepticism, creativity, open-mindedness, accuracy, precision, honesty, and persistence, and appreciate their importance as scientific and technological habits of mind
STRAND / SPECIFIC OUTCOME	GLO-C6.	Employ effective communication skills and utilize information technology to gather and share scientific and technological ideas and data
STRAND / COURSE / GENERAL OUTCOME	**MB.GLO-D.**	**Foundation D: Essential Science Knowledge**
STRAND / SPECIFIC OUTCOME	GLO-D4.	Understand how stability, motion, forces, and energy transfers and transformations play a role in a wide range of natural and constructed contexts

STRAND / COURSE / GENERAL OUTCOME	MB.GLO-E.	Foundation E: Unifying Concepts
STRAND / SPECIFIC OUTCOME	GLO-E4.	Recognize that energy, whether transmitted or transformed, is the driving force of both movement and change, and is inherent within materials and in the interactions among them

STRAND / COURSE / GENERAL OUTCOME	MB.8-0.	Overall Skills and Attitudes - Specific Learning Outcomes
STRAND / SPECIFIC OUTCOME	**8-0-1.**	**Initiating**
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-1b.	Select and justify a method to be used in finding the answer to a specific question. (GLO: C2)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-1c.	Identify practical problems to solve. (GLO: C3)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-1d.	Select and justify a method to be used in finding a solution to a practical problem. (GLO: C3)

STRAND / COURSE / GENERAL OUTCOME	MB.8-0.	Overall Skills and Attitudes - Specific Learning Outcomes
STRAND / SPECIFIC OUTCOME	**8-0-3.**	**Planning**
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-3d.	Develop criteria to evaluate a prototype or consumer product. (GLO: C3)

STRAND / COURSE / GENERAL OUTCOME	MB.8-0.	Overall Skills and Attitudes - Specific Learning Outcomes
STRAND / SPECIFIC OUTCOME	**8-0-4.**	**Implementing a Plan**

GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-4b.	Construct a prototype. (GLO: C3)

STRAND / COURSE / GENERAL OUTCOME	**MB.8-0.**	**Overall Skills and Attitudes - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	**8-0-5.**	**Observing, Measuring, Recording**

GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-5b.	Test a prototype or consumer product with respect to pre-determined criteria. (GLO: C3, C5)

GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-5c.	Select and use tools to observe, measure, and construct. (GLO: C2, C3, C5)

STRAND / COURSE / GENERAL OUTCOME	**MB.8-0.**	**Overall Skills and Attitudes - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	**8-0-6.**	**Analysing and Interpreting**

GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-6d.	Identify and make improvements to a prototype and explain the rationale for the changes. (GLO: C3, C4)

STRAND / COURSE / GENERAL OUTCOME	**MB.8-0.**	**Overall Skills and Attitudes - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	**8-0-7.**	**Concluding and Applying**

GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-7e.	Identify new practical problems to solve. (GLO: C3)

STRAND / COURSE / GENERAL OUTCOME	**MB.8-0.**	**Overall Skills and Attitudes - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	**8-0-8.**	**Reflecting on Science and Technology**

GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-8b.	Describe examples of how scientific knowledge has evolved in light of new evidence, and the role of technology in this evolution. (GLO: A2, A5, B1)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-8d.	Describe examples of how technologies have evolved over time in response to changing needs and scientific advances. (GLO: A5, B1, B2)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-8g.	Discuss societal, environmental, and economic impacts of scientific and technological endeavours. (GLO: A1, B1, B3, B5)
STRAND / COURSE / GENERAL OUTCOME	**MB.8-0.**	**Overall Skills and Attitudes - Specific Learning Outcomes**
STRAND / SPECIFIC OUTCOME	**8-0-9.**	**Demonstrating Scientific and Technological Attitudes**
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-9d.	Value skepticism, accuracy, precision, and open-mindedness as scientific and technological habits of mind. (GLO: C5)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-9e.	Be sensitive and responsible in maintaining a balance between the needs of humans and a sustainable environment. (GLO: B5)
GENERAL OUTCOME / SPECIFIC OUTCOME / SKILL	8-0-9f.	Consider the cause and effects relationships of actions and decisions. (GLO: B5, C4, E3)

New Brunswick Curriculum

Mathematics

Grade **7** - Adopted: **2008**

DOCUMENT/GENERAL LEARNING OUTCOME		**Grade 7**
CATEGORY		**MATHEMATICAL PROCESSES**
SECTION/SPECIFIC LEARNING OUTCOME	C.	communicate in order to learn and express their understanding of mathematics (Communications: C)

SECTION/SPECIFIC LEARNING OUTCOME	PS.	develop and apply new mathematical knowledge through problem solving (Problem Solving: PS)
SECTION/SPECIFIC LEARNING OUTCOME	R.	develop mathematical reasoning (Reasoning: R)
SECTION/SPECIFIC LEARNING OUTCOME	V.	develop visualization skills to assist in processing information, making connections and solving problems (Visualization: V).

New Brunswick Curriculum

Mathematics

Grade **8** - Adopted: **2009**

DOCUMENT/GENERAL LEARNING OUTCOME		**Grade 8**
CATEGORY		**MATHEMATICAL PROCESSES**
SECTION/SPECIFIC LEARNING OUTCOME	C.	communicate in order to learn and express their understanding of mathematics (Communications: C)
SECTION/SPECIFIC LEARNING OUTCOME	PS.	develop and apply new mathematical knowledge through problem solving (Problem Solving: PS)
SECTION/SPECIFIC LEARNING OUTCOME	R.	develop mathematical reasoning (Reasoning: R)
SECTION/SPECIFIC LEARNING OUTCOME	V.	develop visualization skills to assist in processing information, making connections and solving problems (Visualization: V).

New Brunswick Curriculum

Science

Grade **7** - Adopted: **2002**

DOCUMENT/GENERAL LEARNING OUTCOME		**Atlantic Canada Science Curriculum (Specific curriculum outcomes)**
CATEGORY		**Science 7 Curriculum**
SECTION/SPECIFIC LEARNING OUTCOME		**PHYSICAL SCIENCE – Unit 3: Heat**
UNIT/SPECIFIC LEARNING OUTCOME		**Heat Transfer**
SPECIFIC LEARNING OUTCOME		describe the science underlying heat transfer in solar heating systems and central heating systems in houses (111-5)

SPECIFIC LEARNING OUTCOME		describe how a technology associated with heat has affected lives (113-4)

Newfoundland and Labrador Curriculum Guides

Mathematics

Grade **8** - Adopted: **2015**

COURSE / STRAND	**NL.8PR.**	**Patterns and Relations**
STRAND / GCO		**Variables and Equations: Represent algebraic expressions in multiple ways.**
GCO / SCO	**8PR2.**	**Model and solve problems using linear equations of the form: ax = b; x/a = b, a ≠ 0; ax + b = c; x/a + b = c, a ≠ 0; a(x+b) = c; where a, b, and c are integers.**
OUTCOME / INDICATOR	8PR2.5.	Apply the distributive property to solve a given linear equation of the form a(x + b) = c.

Newfoundland and Labrador Curriculum Guides

Science

Grade **7** - Adopted: **2013**

COURSE / STRAND	**NL.7.1.**	**Interactions Within Ecosystems**
STRAND / GCO	**7.1.4.**	**Energy Flow in an Ecosystem:**
GCO / SCO	7.1.4.12.	Illustrate and explain the nutrient cycle.

COURSE / STRAND	**NL.7.2.**	**Heat**
STRAND / GCO	**7.2.5.**	**Heat Transfer - Home Heating Technologies: Students will be expected to:**
GCO / SCO	**7.2.5.1.**	**Provide examples of heat technologies used past and present to heat homes in Newfoundland and Labrador, including. (110-7):**
OUTCOME / INDICATOR	7.2.5.1.vii.	Solar

Northern Territory Curriculum

Mathematics

Grade **7** - Adopted: **2015**

STRAND / DOMAIN	**ACMNA.7.**	**Number and Algebra**
OUTCOME / INDICATOR	**ACMNA.7.1.**	**Number and place value**
INDICATOR	**ACMNA.7.1.3.**	**Apply the associative, commutative and distributive laws to aid mental and written computation (ACMNA151)**
INDICATOR	ACMNA.7.1.3.1.	Understanding that arithmetic laws are powerful ways of describing and simplifying calculations

STRAND / DOMAIN	**ACMNA.7.**	**Number and Algebra**
OUTCOME / INDICATOR	**ACMNA.7.4.**	**Patterns and algebra**

INDICATOR	**ACMNA.7.4.1.**	**Introduce the concept of variables as a way of representing numbers using letters (ACMNA175)**
INDICATOR	ACMNA.7.4.1.1.	Understanding that arithmetic laws are powerful ways of describing and simplifying calculations and that using these laws leads to the generality of algebra

Northern Territory Curriculum

Mathematics

Grade **8** - Adopted: **2015**

STRAND / DOMAIN	**ACMNA.8.**	**Number and Algebra**
OUTCOME / INDICATOR	**ACMNA.8.4.**	**Patterns and algebra**
INDICATOR	**ACMNA.8.4.3.**	**Simplify algebraic expressions involving the four operations (ACMNA192)**
INDICATOR	ACMNA.8.4.3.1.	Understanding that the laws used with numbers can also be used with algebra

Northern Territory Curriculum

Science

Grade **7** - Adopted: **2016**

STRAND / DOMAIN	**ACSSU.7.**	**Science Understanding**
OUTCOME / INDICATOR	**ACSSU.7.3.**	**Earth and space sciences**
INDICATOR	**ACSSU.7.3.2.**	**Some of Earth's resources are renewable, including water that cycles through the environment, but others are non- renewable (ACSSU116)**
INDICATOR	ACSSU.7.3.2.1.	Considering what is meant by the term 'renewable' in relation to the Earth's resources
INDICATOR	ACSSU.7.3.2.2.	Considering timescales for regeneration of resources
INDICATOR	ACSSU.7.3.2.3.	Comparing renewable and non-renewable energy sources, including how they are used in a range of situations

STRAND / DOMAIN	**ACSHE.7.**	**Science as a Human Endeavour**
OUTCOME / INDICATOR	**ACSHE.7.2.**	**Use and influence of science**
INDICATOR	**ACSHE.7.2.2.**	**People use science understanding and skills in their occupations and these have influenced the development of practices in areas of human activity (ACSHE121)**
INDICATOR	ACSHE.7.2.2.1.	Investigating everyday applications of physical separation techniques such as filtering, sorting waste materials, reducing pollution, extracting products from plants, separating blood products and cleaning up oil spills

STRAND / DOMAIN	**ACSIS.7.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.7.1.**	**Questioning and predicting**

INDICATOR	**ACSIS.7.1.1.**	**Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSIS124)**
INDICATOR	ACSIS.7.1.1.2.	Recognising that the solution of some questions and problems requires consideration of social, cultural, economic or moral aspects rather than or as well as scientific investigation
STRAND / DOMAIN	**ACSIS.7.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.7.2.**	**Planning and conducting**
INDICATOR	**ACSIS.7.2.2.**	**Measure and control variables, select equipment appropriate to the task and collect data with accuracy (ACSIS126)**
INDICATOR	ACSIS.7.2.2.3.	Using specialised equipment to increase the accuracy of measurement within an investigation
STRAND / DOMAIN	**ACSIS.7.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.7.5.**	**Communicating**
INDICATOR	**ACSIS.7.5.1.**	**Communicate ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate (ACSIS133)**
INDICATOR	ACSIS.7.5.1.1.	Presenting the outcomes of research using effective forms of representation of data or ideas and scientific language that is appropriate for the target audience

Northern Territory Curriculum

Science

Grade **8** - Adopted: **2016**

STRAND / DOMAIN	**ACSIS.8.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.8.1.**	**Questioning and predicting**
INDICATOR	**ACSIS.8.1.1.**	**Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSIS139)**
INDICATOR	ACSIS.8.1.1.2.	Recognising that the solution of some questions and problems requires consideration of social, cultural, economic or moral aspects rather than or as well as scientific investigation
STRAND / DOMAIN	**ACSIS.8.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.8.2.**	**Planning and conducting**
INDICATOR	**ACSIS.8.2.2.**	**Measure and control variables, select equipment appropriate to the task and collect data with accuracy (ACSIS141)**
INDICATOR	ACSIS.8.2.2.1.	Using specialised equipment to increase the accuracy of measurement within an investigation
STRAND / DOMAIN	**ACSIS.8.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.8.5.**	**Communicating**

INDICATOR	**ACSIS.8.5.1.**	**Communicate ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate (ACSIS148)**
INDICATOR	ACSIS.8.5.1.1.	Using digital technologies to construct a range of text types to present science ideas
INDICATOR	ACSIS.8.5.1.2.	Selecting and using appropriate language and representations to communicate science ideas within a specified text type and for a specified audience

Northern Territory Curriculum

Technology Education

Grade **7** - Adopted: **2016 (ACARA)**

STRAND / DOMAIN		**Design and Technologies**
OUTCOME / INDICATOR	**ACTDEK.7-8.**	**Design and Technologies Knowledge and Understanding**
INDICATOR	**ACTDEK.7-8.2.**	**Analyse how motion, force and energy are used to manipulate and control electromechanical systems when designing simple, engineered solutions (ACTDEK031)**
INDICATOR	ACTDEK.7-8.2.1.	Investigating influences impacting on manufactured products and processes such as historical developments, society, new materials, control systems and biomimicry, for example the development of Velcro
INDICATOR	ACTDEK.7-8.2.2.	Experimenting to select the most appropriate principles and systems on which to base design ideas, for example structural components to be tested for strength
INDICATOR	ACTDEK.7-8.2.3.	Calculating an engineered system's outputs, for example speed, brightness of light, volume of sound
INDICATOR	ACTDEK.7-8.2.4.	Producing prototypes and jigs to test functionality, including the use of rapid prototyping tools such as 3D printers
INDICATOR	ACTDEK.7-8.2.5.	Using code to control systems, for example code to program a microcontroller or a simple, object-based coding application to program a system such as a remote-controlled car or simple robotic arm
INDICATOR	ACTDEK.7-8.2.6.	Investigating components, tools and equipment, for example testing the durability of batteries, determining the effective range of wireless devices

STRAND / DOMAIN		**Design and Technologies**
OUTCOME / INDICATOR	**ACTDEK.7-8.**	**Design and Technologies Knowledge and Understanding**
INDICATOR	**ACTDEK.7-8.3.**	**Analyse how food and fibre are produced when designing managed environments and how these can become more sustainable (ACTDEK032)**
INDICATOR	ACTDEK.7-8.3.1.	Comparing land and water management methods in contemporary Australian food and fibre production with traditional Aboriginal systems and countries of Asia, for example minimum-tillage cropping, water-efficient irrigation

STRAND / DOMAIN		**Design and Technologies**
OUTCOME / INDICATOR	**ACTDEP.7-8.**	**Design and Technologies Processes and Production Skills**

INDICATOR	**ACTDEP.7-8.2.**	**Generate, develop, test and communicate design ideas, plans and processes for various audiences using appropriate technical terms and technologies including graphical representation techniques (ACTDEP036)**
INDICATOR	ACTDEP.7-8.2.1.	Using a variety of critical and creative thinking strategies such as brainstorming, sketching, 3-D modelling and experimenting to generate innovative design ideas
INDICATOR	ACTDEP.7-8.2.2.	Considering which ideas to further explore and investigating the benefits and drawbacks of ideas, for example using digital polling to capture the views of different groups in the community
INDICATOR	ACTDEP.7-8.2.3.	Identifying factors that may hinder or enhance project development, for example intercultural understanding
INDICATOR	ACTDEP.7-8.2.4.	Developing models, prototypes or samples using a range of materials, tools and equipment to test the functionality of ideas
INDICATOR	ACTDEP.7-8.2.5.	Producing annotated concept sketches and drawings, using: technical terms, scale, symbols, pictorial and aerial views to draw environments; production drawings, orthogonal drawings; patterns and templates to explain design ideas
INDICATOR	ACTDEP.7-8.2.6.	Documenting and communicating the generation and development of design ideas for an intended audience, for example developing a digital portfolio with images and text which clearly communicates each step of a design process
STRAND / DOMAIN		**Digital Technologies**
OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**
INDICATOR	**ACTDIP.7-8.7.**	**Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)**
INDICATOR	ACTDIP.7-8.7.2.	checking the accuracy of an algorithm before it is implemented, for example desk checking it with test data to see if the instructions produce the expected results
INDICATOR	ACTDIP.7-8.7.4.	using structured English to express algorithmic instructions, for example using conventional statements such as ‘while’ and ‘endwhile’ in a ‘while loop’ when describing interactive instruction
STRAND / DOMAIN		**Digital Technologies**
OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**
INDICATOR	**ACTDIP.7-8.8.**	**Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030)**
INDICATOR	ACTDIP.7-8.8.1.	developing and modifying digital solutions by implementing instructions contained in algorithms through programs
INDICATOR	ACTDIP.7-8.8.3.	programming a robot to recognise particular objects and to treat them differently, for example choose objects based on colour
STRAND / DOMAIN		**Digital Technologies**
OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**

INDICATOR	**ACTDIP.7-8.9.**	**Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)**
INDICATOR	ACTDIP.7-8.9.1.	comparing student solutions with existing solutions that solve similar problems, for example identifying differences in the user interface of two adventure games and explaining how these differences affect the usability or appeal of the game
INDICATOR	ACTDIP.7-8.9.2.	judging the quality of a student solution based on specific criteria such as meeting an economic need or contributing to social sustainability

Northern Territory Curriculum

Technology Education

Grade **8** - Adopted: **2016 (ACARA)**

STRAND / DOMAIN		**Design and Technologies**
OUTCOME / INDICATOR	**ACTDEK.7-8.**	**Design and Technologies Knowledge and Understanding**
INDICATOR	**ACTDEK.7-8.2.**	**Analyse how motion, force and energy are used to manipulate and control electromechanical systems when designing simple, engineered solutions (ACTDEK031)**
INDICATOR	ACTDEK.7-8.2.1.	Investigating influences impacting on manufactured products and processes such as historical developments, society, new materials, control systems and biomimicry, for example the development of Velcro
INDICATOR	ACTDEK.7-8.2.2.	Experimenting to select the most appropriate principles and systems on which to base design ideas, for example structural components to be tested for strength
INDICATOR	ACTDEK.7-8.2.3.	Calculating an engineered system's outputs, for example speed, brightness of light, volume of sound
INDICATOR	ACTDEK.7-8.2.4.	Producing prototypes and jigs to test functionality, including the use of rapid prototyping tools such as 3D printers
INDICATOR	ACTDEK.7-8.2.5.	Using code to control systems, for example code to program a microcontroller or a simple, object-based coding application to program a system such as a remote-controlled car or simple robotic arm
INDICATOR	ACTDEK.7-8.2.6.	Investigating components, tools and equipment, for example testing the durability of batteries, determining the effective range of wireless devices

STRAND / DOMAIN		**Design and Technologies**
OUTCOME / INDICATOR	**ACTDEK.7-8.**	**Design and Technologies Knowledge and Understanding**
INDICATOR	**ACTDEK.7-8.3.**	**Analyse how food and fibre are produced when designing managed environments and how these can become more sustainable (ACTDEK032)**
INDICATOR	ACTDEK.7-8.3.1.	Comparing land and water management methods in contemporary Australian food and fibre production with traditional Aboriginal systems and countries of Asia, for example minimum-tillage cropping, water-efficient irrigation

STRAND / DOMAIN		**Design and Technologies**
OUTCOME / INDICATOR	**ACTDEP.7-8.**	**Design and Technologies Processes and Production Skills**

INDICATOR	**ACTDEP.7-8.2.**	**Generate, develop, test and communicate design ideas, plans and processes for various audiences using appropriate technical terms and technologies including graphical representation techniques (ACTDEP036)**
INDICATOR	ACTDEP.7-8.2.1.	Using a variety of critical and creative thinking strategies such as brainstorming, sketching, 3-D modelling and experimenting to generate innovative design ideas
INDICATOR	ACTDEP.7-8.2.2.	Considering which ideas to further explore and investigating the benefits and drawbacks of ideas, for example using digital polling to capture the views of different groups in the community
INDICATOR	ACTDEP.7-8.2.3.	Identifying factors that may hinder or enhance project development, for example intercultural understanding
INDICATOR	ACTDEP.7-8.2.4.	Developing models, prototypes or samples using a range of materials, tools and equipment to test the functionality of ideas
INDICATOR	ACTDEP.7-8.2.5.	Producing annotated concept sketches and drawings, using: technical terms, scale, symbols, pictorial and aerial views to draw environments; production drawings, orthogonal drawings; patterns and templates to explain design ideas
INDICATOR	ACTDEP.7-8.2.6.	Documenting and communicating the generation and development of design ideas for an intended audience, for example developing a digital portfolio with images and text which clearly communicates each step of a design process
STRAND / DOMAIN		**Digital Technologies**
OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**
INDICATOR	**ACTDIP.7-8.7.**	**Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)**
INDICATOR	ACTDIP.7-8.7.2.	checking the accuracy of an algorithm before it is implemented, for example desk checking it with test data to see if the instructions produce the expected results
INDICATOR	ACTDIP.7-8.7.4.	using structured English to express algorithmic instructions, for example using conventional statements such as ‘while’ and ‘endwhile’ in a ‘while loop’ when describing interactive instruction
STRAND / DOMAIN		**Digital Technologies**
OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**
INDICATOR	**ACTDIP.7-8.8.**	**Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030)**
INDICATOR	ACTDIP.7-8.8.1.	developing and modifying digital solutions by implementing instructions contained in algorithms through programs
INDICATOR	ACTDIP.7-8.8.3.	programming a robot to recognise particular objects and to treat them differently, for example choose objects based on colour
STRAND / DOMAIN		**Digital Technologies**
OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**

INDICATOR	**ACTDIP.7-8.9.**	**Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)**
INDICATOR	ACTDIP.7-8.9.1.	comparing student solutions with existing solutions that solve similar problems, for example identifying differences in the user interface of two adventure games and explaining how these differences affect the usability or appeal of the game
INDICATOR	ACTDIP.7-8.9.2.	judging the quality of a student solution based on specific criteria such as meeting an economic need or contributing to social sustainability

Nova Scotia Curriculum

Mathematics

Grade **8** - Adopted: **2015**

GENERAL LEARNING OUTCOME	**NS.8.SCO.**	**Specific Curriculum Outcomes**
CURRICULUM OUTCOME	**8.SCO.PR.**	**Patterns and Relations (PR)**
GRADE LEVEL EXPECTATION	**8.SCO.PR02.**	**Students will be expected to model and solve problems, concretely, pictorially, and symbolically, where a, b, and c are integers, using linear equations of the form ax = b; x/a = b, a ≠ 0; ax + b = c; x/a + b = c, a ≠ 0; a(x + b) = c [C, CN, PS, V]**
EXPECTATION	8.SCO.PR02.06.	Apply the distributive property to solve a given linear equation.

Nova Scotia Curriculum

Science

Grade **7** - Adopted: **2015**

GENERAL LEARNING OUTCOME	**NS.7.GCO.**	**General Curriculum Outcomes**
CURRICULUM OUTCOME	**7.GCO.1.**	**STSE**
GRADE LEVEL EXPECTATION	7.GCO.1.1.	Students will develop an understanding of the nature of science and technology, of the relationships

GENERAL LEARNING OUTCOME	**NS.7.GCO.**	**General Curriculum Outcomes**
CURRICULUM OUTCOME	**7.GCO.2.**	**SKILLS**
GRADE LEVEL EXPECTATION	7.GCO.2.2.	Students will develop the skills required for scientific and technological inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively, and for making informed decisions. between science and technology, and of the social and environmental contexts of science and technology.

GENERAL LEARNING OUTCOME	**NS.7.GCO.**	**General Curriculum Outcomes**
CURRICULUM OUTCOME	**7.GCO.4.**	**ATTITUDES**
GRADE LEVEL EXPECTATION	7.GCO.4.4.	Students will be encouraged to develop attitudes that support the responsible acquisition and application of scientific and technological knowledge to the mutual benefit of self, society, and the environment.

Nova Scotia Curriculum

Science

Grade **8** - Adopted: **2015**

GENERAL LEARNING OUTCOME	**NS.8.GCO.**	**General Curriculum Outcomes**
CURRICULUM OUTCOME	**8.GCO.1.**	**STSE**
GRADE LEVEL EXPECTATION	8.GCO.1.1.	Students will develop an understanding of the nature of science and technology, of the relationships between science and technology, and of the social and environmental contexts of science and technology.

GENERAL LEARNING OUTCOME	**NS.8.GCO.**	**General Curriculum Outcomes**
CURRICULUM OUTCOME	**8.GCO.2.**	**SKILLS**
GRADE LEVEL EXPECTATION	8.GCO.2.1.	Students will develop the skills required for scientific and technological inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively, and for making informed decisions.

GENERAL LEARNING OUTCOME	**NS.8.GCO.**	**General Curriculum Outcomes**
CURRICULUM OUTCOME	**8.GCO.4.**	**ATTITUDES**
GRADE LEVEL EXPECTATION	8.GCO.4.1.	Students will be encouraged to develop attitudes that support the responsible acquisition and application of scientific and technological knowledge to the mutual benefit of self, society, and the environment.

Prince Edward Island Curriculum

Science

Grade **7** - Adopted: **2012**

STRAND / COURSE	**PE.7.3.**	**Physical Science: Heat**
GENERAL LEARNING OUTCOME	**7.3.3.**	**Heat Transfer**
CURRICULUM OUTCOME		**Students will be expected to**
GRADE LEVEL EXPECTATION	7.3.3.2.	Describe the science underlying heat transfer in solar heating systems and central heating systems in houses (111-5).
GRADE LEVEL EXPECTATION	7.3.3.3.	Describe how a technology associated with heat has affected lives (113-4).

Prince Edward Island Curriculum

Science

Grade **8** - Adopted: **2012**

STRAND / COURSE	**PE.8.2.**	**Physical Science Optics**
GENERAL LEARNING OUTCOME	**8.2.4.**	**Electromagnetic Radiation**
CURRICULUM OUTCOME		**Students will be expected to**

GRADE LEVEL EXPECTATION	8.2.4.5.	Describe possible negative and positive effects of technologies associated with electromagnetic radiation (113-2).

Programme de formation de l'école québécoise - Progression des apprentissages

Mathematics

Grade **7** - Adopted: **2009**

STRAND	**QC.2.**	**Arithmétique: opérations Comprendre les nombres réels**
STANDARD	**2.1.**	**Nombres naturels inférieurs à 1.000.000**
SUBSTRAND	2.1.b.	Utilise des objets, des schémas ou des équations pour représenter une situation et, inversement, décrit une situation représentée par des objets, des schémas ou des équations (l'utilisation de différentes significations des quatre opérations)
SUBSTRAND	2.1.d.	Détermine les équivalences numériques à l'aide des relations entre les opérations, les propriétés commutatives et associatives de l'addition et de multiplication, la propriété distributive de la multiplication sur l'addition ou la soustraction
STRAND	**QC.2.**	**Arithmétique: opérations Comprendre les nombres réels**
STANDARD	**2.3.**	**Décimales**
SUBSTRAND	2.3.b.	Détermine les équivalences numériques à l'aide des relations entre les opérations (opérations inverses), les propriétés commutatives et associatives de l'addition et de multiplication, la propriété distributive de la multiplication sur l'addition ou la soustraction
STRAND	**QC.2.**	**Arithmétique: opérations Comprendre les nombres réels**
STANDARD	2.6.	Traduit (mathematizes) une situation à l'aide d'une séquence d'opérations (pas plus de deux niveaux de parenthèses)
STRAND	**QC.5.**	**Algèbre: Comprendre et manipuler des expressions algébriques**
STANDARD	**5.C.**	**Analyse des situations en utilisant des équations ou d'inégalités**
SUBSTRAND	5.C.7.	Transforme les égalités arithmétiques et les équations de maintenir l'équivalence (propriétés et les règles pour transformer les égalités) et justifie les étapes suivies, si nécessaire

Programme de formation de l'école québécoise - Progression des apprentissages

Mathematics

Grade **8** - Adopted: **2009**

STRAND	**QC.2.**	**Arithmétique: opérations Comprendre les nombres réels**
STANDARD	2.6.	Traduit (mathematizes) une situation à l'aide d'une séquence d'opérations (pas plus de deux niveaux de parenthèses)
STRAND	**QC.5.**	**Algèbre: Comprendre et manipuler des expressions algébriques**
STANDARD	**5.C.**	**Analyse des situations en utilisant des équations ou d'inégalités**
SUBSTRAND	5.C.7.	Transforme les égalités arithmétiques et les équations de maintenir l'équivalence (propriétés et les règles pour transformer les égalités) et justifie les étapes suivies, si nécessaire

Programme de formation de l'école québécoise - Progression des apprentissages

Science

Grade **7** - Adopted: **2009**

STRAND	**QC.3.**	**Parcours de formation générale: La Terre et l'espace**
STANDARD	**3.B.**	**Phénomènes géologiques et géophysiques**
SUBSTRAND	**3.B.h.**	**Sources d'énergie naturelles**
COMPETENCY	3.B.h.i.	Décrit le rôle de l'énergie solaire comme source d'énergie naturelle (par exemple le vent, les tornades, les ouragans, les tempêtes)

STRAND	**QC.3.**	**Parcours de formation générale: La Terre et l'espace**
STANDARD	**3.B.**	**Phénomènes géologiques et géophysiques**
SUBSTRAND	**3.B.i.**	**Les ressources énergétiques renouvelables et non renouvelables**
COMPETENCY	3.B.i.i.	Distinguer les ressources énergétiques renouvelables et non renouvelables (soleil, par exemple, la roche en fusion, l'eau en mouvement, de l'huile)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.1.**	**Forces et mouvements**
COMPETENCY	**4.B.1.a.**	**Types de mouvement**
OBJECTIVE	4.B.1.a.i.	Identifie les parties qui se déplacent d'une manière spécifique dans un objet technique (rectiligne translation, rotation, hélicoïdal)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.2.**	**Les systèmes technologiques**
COMPETENCY	**4.B.2.a.**	**Système**
OBJECTIVE	4.B.2.a.i.	Identifie un système (ensemble d'éléments connectés qui interagissent les uns avec les autres) dans un objet technique ou à l'application technologique
OBJECTIVE	4.B.2.a.ii.	Décrit la fonction globale d'un système technologique
OBJECTIVE	4.B.2.a.iii.	Noms des entrées et sorties d'un système technologique
OBJECTIVE	4.B.2.a.iv.	Noms des processus et des éléments de commande d'un système technologique

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.2.**	**Les systèmes technologiques**
COMPETENCY	**4.B.2.b.**	**Composantes d'un système**
OBJECTIVE	4.B.2.b.i.	Décrit le rôle des composants d'un système technologique (par exemple, explique le rôle des parties d'un système d'éclairage)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**

STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.2.**	**Les systèmes technologiques**
COMPETENCY	**4.B.2.c.**	**Transformations de l'énergie**
OBJECTIVE	4.B.2.c.ii.	Définit les transformations d'énergie
OBJECTIVE	4.B.2.c.iii.	Identifie les transformations d'énergie dans un objet technique ou du système technologique

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.3.**	**Ingénierie**
COMPETENCY	**4.B.3.a.**	**De base des fonctions mécaniques (liaisons, de contrôle de guidage)**
OBJECTIVE	4.B.3.a.i.	Décrit le rôle des liens et des contrôles directeurs dans un objet technique
OBJECTIVE	4.B.3.a.ii.	Identifie un contrôle de guidage dans un objet technique, ainsi que les liens connexes (par exemple, une roulette à pizza est guidé par un pivot, qui le lie à la poignée)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.3.**	**Ingénierie**
COMPETENCY	**4.B.3.h.**	**Des systèmes de transmission de mouvement**
OBJECTIVE	4.B.3.h.i.	Identifie les systèmes de transmission de mouvement dans des objets techniques

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.3.**	**Ingénierie**
COMPETENCY	**4.B.3.k.**	**Systèmes de transformation de mouvement**
OBJECTIVE	4.B.3.k.i.	Identifie les systèmes de transformation de mouvement dans des objets techniques

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.D.**	**Matériels**
SUBSTRAND	**4.D.1.**	**Les ressources matérielles**
COMPETENCY	**4.D.1.a.**	**Matières premières**
OBJECTIVE	4.D.1.a.i.	Matériaux associés premières avec les matériaux non transformés utilisés dans une industrie (par exemple la bauxite est la matière première utilisée dans les alumineries)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.D.**	**Matériels**
SUBSTRAND	**4.D.1.**	**Les ressources matérielles**
COMPETENCY	**4.D.1.c.**	**Équipement**

OBJECTIVE	4.D.1.c.i.	Définit les outils et les équipements que les éléments nécessaires à la fabrication d'un objet (usinage, contrôle, assemblage)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.E.**	**Fabrication**
SUBSTRAND	**4.E.a.**	**Caractéristiques**
COMPETENCY	4.E.a.ii.	Évalue un objet prototype ou technique, basée sur les environnements décrits dans le cahier des charges (humaine, technique, industriel, économique, physique, de l'environnement)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.E.**	**Fabrication**
SUBSTRAND	**4.E.b.**	**Feuille de processus de fabrication**
COMPETENCY	4.E.b.i.	Définit une feuille processus de fabrication comme un ensemble d'étapes à suivre pour usiner les pièces qui composent un objet technique
COMPETENCY	4.E.b.ii.	Suit un processus et une feuille de montage pour construire un objet constitué de composants rares ou pour construire une partie de cet objet

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.a.**	**En toute sécurité en utilisant des machines et tools4**
OBJECTIVE	5.A.2.a.i.	Utiliser les outils en toute sécurité (par exemple couteau rétractable, marteau, tournevis, pinces)

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.b.**	**Mesure et portant sur**
OBJECTIVE	5.A.2.b.iii.	Adopte la position appropriée pour la lecture d'un instrument
OBJECTIVE	5.A.2.b.iv.	Marque les matériaux à être façonné à l'aide d'un crayon ou d'un poinçon

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.c.**	**Usinage et formant**
OBJECTIVE	5.A.2.c.i.	Choisit les matériaux appropriés, des outils, des techniques et des processus
OBJECTIVE	5.A.2.c.iii.	Immobilise la partie à former

OBJECTIVE	5.A.2.c.iv.	Formulaires de la partie en conformité avec les étapes dans les processus d'usinage suivantes: le sciage, le forage, ponçage, le dépôt

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.d.**	**Finition**
OBJECTIVE	5.A.2.d.i.	Sables les côtés ou ébavurer les bords de chaque pièce après formage
OBJECTIVE	5.A.2.d.ii.	Utilise la finition appropriée (teinture, peinture)

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.e.**	**Assemblage**
OBJECTIVE	5.A.2.e.ii.	Immobilise pièces lors du collage
OBJECTIVE	5.A.2.e.iii.	Perceuses à le diamètre des vis, des clous ou des rivets utilisés
OBJECTIVE	5.A.2.e.iv.	Fraises des ouvertures pour vis à tête fraisée

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.f.**	**Montage et démontage**
OBJECTIVE	5.A.2.f.i.	Identifie et réunit les pièces et la quincaillerie
OBJECTIVE	5.A.2.f.ii.	Choisit les outils appropriés
OBJECTIVE	5.A.2.f.iii.	Pour le démontage, les chiffres et d'enregistrer l'emplacement des pièces

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.B.**	**Science**
SUBSTRAND	**5.B.d.**	**Utilisation d'instruments de mesure**
COMPETENCY	5.B.d.i.	Adopte la position appropriée pour la lecture d'un instrument

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.B.**	**Science**
SUBSTRAND	**5.B.e.**	**Utilisation d'instruments d'observation**

COMPETENCY	5.B.e.i.	Utilise des instruments d'observation appropriée (loupe, loupe binoculaire, jumelles, microscope)
STRAND	**QC.6.**	**Parcours de formation générale: Stratégies**
STANDARD	**6.A.**	**Stratégies d'exploration**
SUBSTRAND	6.A.2.	La distinction entre les différents types d'informations utiles pour résoudre le problème
SUBSTRAND	6.A.8.	Explorer différentes manières de résoudre le problème
SUBSTRAND	6.A.11.	Tenant compte des contraintes liées à la résolution d'un problème ou faire un objet (par exemple: spécifications, les ressources disponibles, le temps alloué)
SUBSTRAND	6.A.13.	Utilisation de différents types de raisonnement (par exemple, induction, déduction, l'inférence, la comparaison, la classification)
SUBSTRAND	6.A.14.	En utilisant des approches empiriques (par exemple du procès et l'erreur, l'analyse, l'exploration en utilisant ses sens)
STRAND	**QC.6.**	**Parcours de formation générale: Stratégies**
STANDARD	**6.B.**	**Stratégies d'instrumentation**
SUBSTRAND	6.B.3.	Recourir au design technique pour illustrer une solution (par exemple des diagrammes, des croquis, des dessins techniques)
SUBSTRAND	6.B.4.	En utilisant des outils différents pour l'enregistrement des informations (par exemple des diagrammes, des notes, des graphiques, des procédures, le journal de bord)
SUBSTRAND	6.B.5.	En utilisant une variété de techniques d'observation et d'outils
SUBSTRAND	6.B.6.	Sélection des techniques appropriées ou des outils pour l'observation
STRAND	**QC.6.**	**Parcours de formation générale: Stratégies**
STANDARD	**6.C.**	**Des stratégies analytiques**
SUBSTRAND	6.C.1.	Identifier les contraintes et les éléments importants liés à la situation de résolution de problèmes
SUBSTRAND	6.C.2.	Diviser un problème complexe en sous-problèmes plus simples
SUBSTRAND	6.C.3.	Utilisation de différents types de raisonnement (par exemple le raisonnement inductif et déductif, la comparaison, la classification, priorisation) afin de traiter l'information
STRAND	**QC.6.**	**Parcours de formation générale: Stratégies**
STANDARD	**6.D.**	**Les stratégies de communication**
SUBSTRAND	6.D.1.	En utilisant différents moyens de communication pour proposer des explications ou des solutions (par exemple une présentation orale, présentation écrite, la procédure)
SUBSTRAND	6.D.3.	L'échange d'informations

SUBSTRAND	6.D.5.	L'utilisation d'outils pour afficher des informations dans différents formats (par exemple des tableaux de données, graphiques, diagrammes)

Programme de formation de l'école québécoise - Progression des apprentissages

Science

Grade **8** - Adopted: **2009**

STRAND	**QC.3.**	**Parcours de formation générale: La Terre et l'espace**
STANDARD	**3.B.**	**Phénomènes géologiques et géophysiques**
SUBSTRAND	**3.B.h.**	**Sources d'énergie naturelles**
COMPETENCY	3.B.h.i.	Décrit le rôle de l'énergie solaire comme source d'énergie naturelle (par exemple le vent, les tornades, les ouragans, les tempêtes)

STRAND	**QC.3.**	**Parcours de formation générale: La Terre et l'espace**
STANDARD	**3.B.**	**Phénomènes géologiques et géophysiques**
SUBSTRAND	**3.B.i.**	**Les ressources énergétiques renouvelables et non renouvelables**
COMPETENCY	3.B.i.i.	Distinguer les ressources énergétiques renouvelables et non renouvelables (soleil, par exemple, la roche en fusion, l'eau en mouvement, de l'huile)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.1.**	**Forces et mouvements**
COMPETENCY	**4.B.1.a.**	**Types de mouvement**
OBJECTIVE	4.B.1.a.i.	Identifie les parties qui se déplacent d'une manière spécifique dans un objet technique (rectiligne translation, rotation, hélicoïdal)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.2.**	**Les systèmes technologiques**
COMPETENCY	**4.B.2.a.**	**Système**
OBJECTIVE	4.B.2.a.i.	Identifie un système (ensemble d'éléments connectés qui interagissent les uns avec les autres) dans un objet technique ou à l'application technologique
OBJECTIVE	4.B.2.a.ii.	Décrit la fonction globale d'un système technologique
OBJECTIVE	4.B.2.a.iii.	Noms des entrées et sorties d'un système technologique
OBJECTIVE	4.B.2.a.iv.	Noms des processus et des éléments de commande d'un système technologique

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.2.**	**Les systèmes technologiques**
COMPETENCY	**4.B.2.b.**	**Composantes d'un système**

OBJECTIVE	4.B.2.b.i.	Décrit le rôle des composants d'un système technologique (par exemple, explique le rôle des parties d'un système d'éclairage)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.2.**	**Les systèmes technologiques**
COMPETENCY	**4.B.2.c.**	**Transformations de l'énergie**
OBJECTIVE	4.B.2.c.ii.	Définit les transformations d'énergie
OBJECTIVE	4.B.2.c.iii.	Identifie les transformations d'énergie dans un objet technique ou du système technologique

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.3.**	**Ingénierie**
COMPETENCY	**4.B.3.a.**	**De base des fonctions mécaniques (liaisons, de contrôle de guidage)**
OBJECTIVE	4.B.3.a.i.	Décrit le rôle des liens et des contrôles directeurs dans un objet technique
OBJECTIVE	4.B.3.a.ii.	Identifie un contrôle de guidage dans un objet technique, ainsi que les liens connexes (par exemple, une roulette à pizza est guidé par un pivot, qui le lie à la poignée)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.3.**	**Ingénierie**
COMPETENCY	**4.B.3.h.**	**Des systèmes de transmission de mouvement**
OBJECTIVE	4.B.3.h.i.	Identifie les systèmes de transmission de mouvement dans des objets techniques

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.B.**	**Génie mécanique**
SUBSTRAND	**4.B.3.**	**Ingénierie**
COMPETENCY	**4.B.3.k.**	**Systèmes de transformation de mouvement**
OBJECTIVE	4.B.3.k.i.	Identifie les systèmes de transformation de mouvement dans des objets techniques

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.D.**	**Matériels**
SUBSTRAND	**4.D.1.**	**Les ressources matérielles**
COMPETENCY	**4.D.1.a.**	**Matières premières**
OBJECTIVE	4.D.1.a.i.	Matériaux associés premières avec les matériaux non transformés utilisés dans une industrie (par exemple la bauxite est la matière première utilisée dans les alumineries)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**

STANDARD	**4.D.**	**Matériels**
SUBSTRAND	**4.D.1.**	**Les ressources matérielles**
COMPETENCY	**4.D.1.c.**	**Équipement**
OBJECTIVE	4.D.1.c.i.	Définit les outils et les équipements que les éléments nécessaires à la fabrication d'un objet (usinage, contrôle, assemblage)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.E.**	**Fabrication**
SUBSTRAND	**4.E.a.**	**Caractéristiques**
COMPETENCY	4.E.a.ii.	Évalue un objet prototype ou technique, basée sur les environnements décrits dans le cahier des charges (humaine, technique, industriel, économique, physique, de l'environnement)

STRAND	**QC.4.**	**Parcours de formation générale: Le monde technologique**
STANDARD	**4.E.**	**Fabrication**
SUBSTRAND	**4.E.b.**	**Feuille de processus de fabrication**
COMPETENCY	4.E.b.i.	Définit une feuille processus de fabrication comme un ensemble d'étapes à suivre pour usiner les pièces qui composent un objet technique
COMPETENCY	4.E.b.ii.	Suit un processus et une feuille de montage pour construire un objet constitué de composants rares ou pour construire une partie de cet objet

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.a.**	**En toute sécurité en utilisant des machines et tools4**
OBJECTIVE	5.A.2.a.i.	Utiliser les outils en toute sécurité (par exemple couteau rétractable, marteau, tournevis, pinces)

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.b.**	**Mesure et portant sur**
OBJECTIVE	5.A.2.b.iii.	Adopte la position appropriée pour la lecture d'un instrument
OBJECTIVE	5.A.2.b.iv.	Marque les matériaux à être façonné à l'aide d'un crayon ou d'un poinçon

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.c.**	**Usinage et formant**

OBJECTIVE	5.A.2.c.i.	Choisit les matériaux appropriés, des outils, des techniques et des processus
OBJECTIVE	5.A.2.c.iii.	Immobilise la partie à former
OBJECTIVE	5.A.2.c.iv.	Formulaires de la partie en conformité avec les étapes dans les processus d'usinage suivantes: le sciage, le forage, ponçage, le dépôt

STRAND	**QC.5.**	**Parcours de formation générale: Technologies**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.d.**	**Finition**
OBJECTIVE	5.A.2.d.i.	Sables les côtés ou ébavurer les bords de chaque pièce après formage
OBJECTIVE	5.A.2.d.ii.	Utilise la finition appropriée (teinture, peinture)

STRAND	**QC.5.**	**Parcours de formation générale: Technologies**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.e.**	**Assemblage**
OBJECTIVE	5.A.2.e.ii.	Immobilise pièces lors du collage
OBJECTIVE	5.A.2.e.iii.	Perceuses à le diamètre des vis, des clous ou des rivets utilisés
OBJECTIVE	5.A.2.e.iv.	Fraises des ouvertures pour vis à tête fraisée

STRAND	**QC.5.**	**Parcours de formation générale: Technologies**
STANDARD	**5.A.**	**Technologie**
SUBSTRAND	**5.A.2.**	**Fabrication**
COMPETENCY	**5.A.2.f.**	**Montage et démontage**
OBJECTIVE	5.A.2.f.i.	Identifie et réunit les pièces et la quincaillerie
OBJECTIVE	5.A.2.f.ii.	Choisit les outils appropriés
OBJECTIVE	5.A.2.f.iii.	Pour le démontage, les chiffres et d'enregistrer l'emplacement des pièces

STRAND	**QC.5.**	**Parcours de formation générale: Technologies**
STANDARD	**5.B.**	**Science**
SUBSTRAND	**5.B.d.**	**Utilisation d'instruments de mesure**
COMPETENCY	5.B.d.i.	Adopte la position appropriée pour la lecture d'un instrument

STRAND	**QC.5.**	**Parcours de formation générale: Techniques**
STANDARD	**5.B.**	**Science**
SUBSTRAND	**5.B.e.**	**Utilisation d'instruments d'observation**
COMPETENCY	5.B.e.i.	Utilise des instruments d'observation appropriée (loupe, loupe binoculaire, jumelles, microscope)

STRAND	**QC.6.**	**Parcours de formation générale: Stratégies**
STANDARD	**6.A.**	**Stratégies d'exploration**
SUBSTRAND	6.A.2.	La distinction entre les différents types d'informations utiles pour résoudre le problème
SUBSTRAND	6.A.8.	Explorer différentes manières de résoudre le problème
SUBSTRAND	6.A.11.	Tenant compte des contraintes liées à la résolution d'un problème ou faire un objet (par exemple: spécifications, les ressources disponibles, le temps alloué)
SUBSTRAND	6.A.13.	Utilisation de différents types de raisonnement (par exemple, induction, déduction, l'inférence, la comparaison, la classification)
SUBSTRAND	6.A.14.	En utilisant des approches empiriques (par exemple du procès et l'erreur, l'analyse, l'exploration en utilisant ses sens)

STRAND	**QC.6.**	**Parcours de formation générale: Stratégies**
STANDARD	**6.B.**	**Stratégies d'instrumentation**
SUBSTRAND	6.B.3.	Recourir au design technique pour illustrer une solution (par exemple des diagrammes, des croquis, des dessins techniques)
SUBSTRAND	6.B.4.	En utilisant des outils différents pour l'enregistrement des informations (par exemple des diagrammes, des notes, des graphiques, des procédures, le journal de bord)
SUBSTRAND	6.B.5.	En utilisant une variété de techniques d'observation et d'outils
SUBSTRAND	6.B.6.	Sélection des techniques appropriées ou des outils pour l'observation

STRAND	**QC.6.**	**Parcours de formation générale: Stratégies**
STANDARD	**6.C.**	**Des stratégies analytiques**
SUBSTRAND	6.C.1.	Identifier les contraintes et les éléments importants liés à la situation de résolution de problèmes
SUBSTRAND	6.C.2.	Diviser un problème complexe en sous-problèmes plus simples
SUBSTRAND	6.C.3.	Utilisation de différents types de raisonnement (par exemple le raisonnement inductif et déductif, la comparaison, la classification, priorisation) afin de traiter l'information

STRAND	**QC.6.**	**Parcours de formation générale: Stratégies**
STANDARD	**6.D.**	**Les stratégies de communication**

SUBSTRAND	6.D.1.	En utilisant différents moyens de communication pour proposer des explications ou des solutions (par exemple une présentation orale, présentation écrite, la procédure)
SUBSTRAND	6.D.3.	L'échange d'informations
SUBSTRAND	6.D.5.	L'utilisation d'outils pour afficher des informations dans différents formats (par exemple des tableaux de données, graphiques, diagrammes)

Québec Education Program Progression of Learning

Mathematics

Grade **7** - Adopted: **2009/Updated 2016**

STRAND	**QC.2.**	**Arithmetic: Understanding operations involving real numbers**
STANDARD	**2.1.**	**Natural numbers less than 1,000,000**
SUBSTRAND	2.1.b.	Uses objects, diagrams or equations to represent a situation and, conversely, describes a situation represented by objects, diagrams or equations (use of different meanings of the four operations)
SUBSTRAND	2.1.d.	Determines numerical equivalencies using relationships between operations, the commutative and associative properties of addition and multiplication, the distributive property of multiplication over addition or subtraction
STRAND	**QC.2.**	**Arithmetic: Understanding operations involving real numbers**
STANDARD	**2.3.**	**Decimals**
SUBSTRAND	2.3.b.	Determines numerical equivalencies using relationships between operations (inverse operations), the commutative and associative properties of addition and multiplication, the distributive property of multiplication over addition or subtraction
STRAND	**QC.2.**	**Arithmetic: Understanding operations involving real numbers**
STANDARD	2.6.	Translates (mathematizes) a situation using a sequence of operations (no more than two levels of parentheses)
STRAND	**QC.5.**	**Algebra: Understanding and manipulating algebraic expressions**
STANDARD	**5.C.**	**Analyzing situations using equations or inequalities**
SUBSTRAND	5.C.7.	Transforms arithmetic equalities and equations to maintain equivalence (properties and rules for transforming equalities) and justifies the steps followed, if necessary

Québec Education Program Progression of Learning

Mathematics

Grade **8** - Adopted: **2009/Updated 2016**

STRAND	**QC.2.**	**Arithmetic: Understanding operations involving real numbers**
STANDARD	2.6.	Translates (mathematizes) a situation using a sequence of operations (no more than two levels of parentheses)
STRAND	**QC.5.**	**Algebra: Understanding and manipulating algebraic expressions**
STANDARD	**5.C.**	**Analyzing situations using equations or inequalities**
SUBSTRAND	5.C.7.	Transforms arithmetic equalities and equations to maintain equivalence (properties and rules for transforming equalities) and justifies the steps followed, if necessary

Québec Education Program Progression of Learning

Science

Grade **7** - Adopted: **2009**

STRAND	**QC.3.**	**General Education Path: The Earth and Space**
STANDARD	**3.B.**	**Geological and geophysical phenomena**
SUBSTRAND	**3.B.h.**	**Natural energy sources**
COMPETENCY	3.B.h.i.	Describes the role of solar energy as a natural energy source (e.g. wind, tornadoes, hurricanes, storms)

STRAND	**QC.3.**	**General Education Path: The Earth and Space**
STANDARD	**3.B.**	**Geological and geophysical phenomena**
SUBSTRAND	**3.B.i.**	**Renewable and nonrenewable energy resources**
COMPETENCY	3.B.i.i.	Distinguishes between renewable and nonrenewable energy resources (e.g. Sun, molten rock, moving water, oil)

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.1.**	**Forces and motion**
COMPETENCY	**4.B.1.a.**	**Types of motion**
OBJECTIVE	4.B.1.a.i.	Identifies parts that move in a specific way in a technical object (rectilinear translation, rotation, helical)

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.2.**	**Technological systems**
COMPETENCY	**4.B.2.a.**	**System**
OBJECTIVE	4.B.2.a.i.	Identifies a system (set of connected elements that interact with each other) in a technical object or technological application
OBJECTIVE	4.B.2.a.ii.	Describes the overall function of a technological system
OBJECTIVE	4.B.2.a.iii.	Names the inputs and outputs of a technological system
OBJECTIVE	4.B.2.a.iv.	Names the processes and control elements of a technological system

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.2.**	**Technological systems**
COMPETENCY	**4.B.2.b.**	**Components of a system**
OBJECTIVE	4.B.2.b.i.	Describes the role of the components of a technological system (e.g. explains the role of the parts of a lighting system)

STRAND	**QC.4.**	**General Education Path: The Technological World**

STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.2.**	**Technological systems**
COMPETENCY	**4.B.2.c.**	**Energy transformations**
OBJECTIVE	4.B.2.c.ii.	Defines energy transformations
OBJECTIVE	4.B.2.c.iii.	Identifies energy transformations in a technical object or technological system

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.3.**	**Engineering**
COMPETENCY	**4.B.3.a.**	**Basic mechanical functions (links, guiding control)**
OBJECTIVE	4.B.3.a.i.	Describes the role of links and guiding controls in a technical object
OBJECTIVE	4.B.3.a.ii.	Identifies a guiding control in a technical object, as well as the related links (e.g. a pizza wheel is guided by a pivot, which links it to the handle)

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.3.**	**Engineering**
COMPETENCY	**4.B.3.h.**	**Motion transmission systems**
OBJECTIVE	4.B.3.h.i.	Identifies motion transmission systems in technical objects

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.3.**	**Engineering**
COMPETENCY	**4.B.3.k.**	**Motion transformation systems**
OBJECTIVE	4.B.3.k.i.	Identifies motion transformation systems in technical objects

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.D.**	**Materials**
SUBSTRAND	**4.D.1.**	**Material resources**
COMPETENCY	**4.D.1.a.**	**Raw materials**
OBJECTIVE	4.D.1.a.i.	Associates raw materials with the unprocessed materials used in an industry (e.g. bauxite is the raw material used in aluminum smelters)

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.D.**	**Materials**
SUBSTRAND	**4.D.1.**	**Material resources**
COMPETENCY	**4.D.1.c.**	**Equipment**

OBJECTIVE	4.D.1.c.i.	Defines tools and equipment as the elements needed to manufacture an object (machining, control, assembly)

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.E.**	**Manufacturing**
SUBSTRAND	**4.E.a.**	**Specifications**
COMPETENCY	4.E.a.ii.	Evaluates a prototype or technical object based on the environments described in the specifications (human, technical, industrial, economic, physical, environmental)

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.E.**	**Manufacturing**
SUBSTRAND	**4.E.b.**	**Manufacturing process sheet**
COMPETENCY	4.E.b.i.	Defines a manufacturing process sheet as a set of steps to follow to machine the parts that make up a technical object
COMPETENCY	4.E.b.ii.	Follows a process and assembly sheet to construct an object consisting of few components or to construct part of that object

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.A.**	**Technology**
SUBSTRAND	**5.A.2.**	**Manufacturing**
COMPETENCY	**5.A.2.a.**	**Safely using machines and tools**
OBJECTIVE	5.A.2.a.i.	Uses tools safely (e.g. retractable utility knife, hammer, screwdriver, pliers)

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.A.**	**Technology**
SUBSTRAND	**5.A.2.**	**Manufacturing**
COMPETENCY	**5.A.2.b.**	**Measuring and laying out**
OBJECTIVE	5.A.2.b.iii.	Adopts the appropriate position for reading an instrument
OBJECTIVE	5.A.2.b.iv.	Marks the materials to be shaped using a pencil or punch

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.A.**	**Technology**
SUBSTRAND	**5.A.2.**	**Manufacturing**
COMPETENCY	**5.A.2.c.**	**Machining and forming**
OBJECTIVE	5.A.2.c.i.	Chooses the appropriate materials, tools, techniques and processes
OBJECTIVE	5.A.2.c.iii.	Immobilizes the part to be formed
OBJECTIVE	5.A.2.c.iv.	Forms the part in accordance with the steps in the following machining processes: sawing, drilling, sanding, filing

STRAND	QC.5.	General Education Path: Techniques
STANDARD	5.A.	Technology
SUBSTRAND	5.A.2.	Manufacturing
COMPETENCY	5.A.2.d.	Finishing
OBJECTIVE	5.A.2.d.i.	Sands the sides or deburrs the edges of each part after forming
OBJECTIVE	5.A.2.d.ii.	Uses the appropriate finish (stain, paint)

STRAND	QC.5.	General Education Path: Techniques
STANDARD	5.A.	Technology
SUBSTRAND	5.A.2.	Manufacturing
COMPETENCY	5.A.2.e.	Assembling
OBJECTIVE	5.A.2.e.ii.	Immobilizes parts during gluing
OBJECTIVE	5.A.2.e.iii.	Drills to the diameter of the screws, nails or rivets used
OBJECTIVE	5.A.2.e.iv.	Countersinks the openings for countersunk screws

STRAND	QC.5.	General Education Path: Techniques
STANDARD	5.A.	Technology
SUBSTRAND	5.A.2.	Manufacturing
COMPETENCY	5.A.2.f.	Assembling and disassembling
OBJECTIVE	5.A.2.f.i.	Identifies and gathers the parts and hardware
OBJECTIVE	5.A.2.f.ii.	Chooses the appropriate tools
OBJECTIVE	5.A.2.f.iii.	For disassembly, numbers and records the location of the parts

STRAND	QC.5.	General Education Path: Techniques
STANDARD	5.B.	Science
SUBSTRAND	5.B.d.	Using measuring instruments
COMPETENCY	5.B.d.i.	Adopts the appropriate position for reading an instrument

STRAND	QC.5.	General Education Path: Techniques
STANDARD	5.B.	Science
SUBSTRAND	5.B.e.	Using observational instruments
COMPETENCY	5.B.e.i.	Uses observational instruments appropriately (e.g. magnifying glass, stereomicroscope, binoculars, microscope)

STRAND	QC.6.	General Education Path: Strategies

STANDARD	**6.A.**	**Exploration strategies**
SUBSTRAND	6.A.2.	Distinguishing between the different types of information useful for solving the problem
SUBSTRAND	6.A.8.	Exploring various ways of solving the problem
SUBSTRAND	6.A.11.	Taking into account the constraints involved in solving a problem or making an object (e.g. specifications, available resources, time allotted)
SUBSTRAND	6.A.13.	Using different types of reasoning (e.g. induction, deduction, inference, comparison, classification)
SUBSTRAND	6.A.14.	Using empirical approaches (e.g. trial and error, analysis, exploration using one's senses)
STRAND	**QC.6.**	**General Education Path: Strategies**
STANDARD	**6.B.**	**Instrumentation strategies**
SUBSTRAND	6.B.3.	Using technical design to illustrate a solution (e.g. diagrams, sketches, technical drawings)
SUBSTRAND	6.B.4.	Using different tools for recording information (e.g. diagrams, notes, graphs, procedures, logbook)
SUBSTRAND	6.B.5.	Using a variety of observational techniques and tools
SUBSTRAND	6.B.6.	Selecting suitable techniques or tools for observation
STRAND	**QC.6.**	**General Education Path: Strategies**
STANDARD	**6.C.**	**Analytical strategies**
SUBSTRAND	6.C.1.	Identifying the constraints and important elements related to the problem-solving situation
SUBSTRAND	6.C.2.	Dividing a complex problem into simpler subproblems
SUBSTRAND	6.C.3.	Using different types of reasoning (e.g. inductive and deductive reasoning, comparison, classification, prioritization) in order to process information
STRAND	**QC.6.**	**General Education Path: Strategies**
STANDARD	**6.D.**	**Communication strategies**
SUBSTRAND	6.D.1.	Using different means of communication to propose explanations or solutions (e.g. oral presentation, written presentation, procedure)
SUBSTRAND	6.D.3.	Exchanging information
SUBSTRAND	6.D.5.	Using tools to display information in various formats (e.g. data tables, graphs, diagrams)

Québec Education Program Progression of Learning

Science

Grade **8** - Adopted: **2009**

STRAND	**QC.3.**	**General Education Path: The Earth and Space**

STANDARD	**3.B.**	**Geological and geophysical phenomena**
SUBSTRAND	**3.B.h.**	**Natural energy sources**
COMPETENCY	3.B.h.i.	Describes the role of solar energy as a natural energy source (e.g. wind, tornadoes, hurricanes, storms)

STRAND	**QC.3.**	**General Education Path: The Earth and Space**
STANDARD	**3.B.**	**Geological and geophysical phenomena**
SUBSTRAND	**3.B.i.**	**Renewable and nonrenewable energy resources**
COMPETENCY	3.B.i.i.	Distinguishes between renewable and nonrenewable energy resources (e.g. Sun, molten rock, moving water, oil)

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.1.**	**Forces and motion**
COMPETENCY	**4.B.1.a.**	**Types of motion**
OBJECTIVE	4.B.1.a.i.	Identifies parts that move in a specific way in a technical object (rectilinear translation, rotation, helical)

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.2.**	**Technological systems**
COMPETENCY	**4.B.2.a.**	**System**
OBJECTIVE	4.B.2.a.i.	Identifies a system (set of connected elements that interact with each other) in a technical object or technological application
OBJECTIVE	4.B.2.a.ii.	Describes the overall function of a technological system
OBJECTIVE	4.B.2.a.iii.	Names the inputs and outputs of a technological system
OBJECTIVE	4.B.2.a.iv.	Names the processes and control elements of a technological system

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.2.**	**Technological systems**
COMPETENCY	**4.B.2.b.**	**Components of a system**
OBJECTIVE	4.B.2.b.i.	Describes the role of the components of a technological system (e.g. explains the role of the parts of a lighting system)

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.2.**	**Technological systems**
COMPETENCY	**4.B.2.c.**	**Energy transformations**

OBJECTIVE	4.B.2.c.ii.	Defines energy transformations
OBJECTIVE	4.B.2.c.iii.	Identifies energy transformations in a technical object or technological system
STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.3.**	**Engineering**
COMPETENCY	**4.B.3.a.**	**Basic mechanical functions (links, guiding control)**
OBJECTIVE	4.B.3.a.i.	Describes the role of links and guiding controls in a technical object
OBJECTIVE	4.B.3.a.ii.	Identifies a guiding control in a technical object, as well as the related links (e.g. a pizza wheel is guided by a pivot, which links it to the handle)
STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.3.**	**Engineering**
COMPETENCY	**4.B.3.h.**	**Motion transmission systems**
OBJECTIVE	4.B.3.h.i.	Identifies motion transmission systems in technical objects
STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.B.**	**Mechanical engineering**
SUBSTRAND	**4.B.3.**	**Engineering**
COMPETENCY	**4.B.3.k.**	**Motion transformation systems**
OBJECTIVE	4.B.3.k.i.	Identifies motion transformation systems in technical objects
STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.D.**	**Materials**
SUBSTRAND	**4.D.1.**	**Material resources**
COMPETENCY	**4.D.1.a.**	**Raw materials**
OBJECTIVE	4.D.1.a.i.	Associates raw materials with the unprocessed materials used in an industry (e.g. bauxite is the raw material used in aluminum smelters)
STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.D.**	**Materials**
SUBSTRAND	**4.D.1.**	**Material resources**
COMPETENCY	**4.D.1.c.**	**Equipment**
OBJECTIVE	4.D.1.c.i.	Defines tools and equipment as the elements needed to manufacture an object (machining, control, assembly)
STRAND	**QC.4.**	**General Education Path: The Technological World**

STANDARD	**4.E.**	**Manufacturing**
SUBSTRAND	**4.E.a.**	**Specifications**
COMPETENCY	4.E.a.ii.	Evaluates a prototype or technical object based on the environments described in the specifications (human, technical, industrial, economic, physical, environmental)

STRAND	**QC.4.**	**General Education Path: The Technological World**
STANDARD	**4.E.**	**Manufacturing**
SUBSTRAND	**4.E.b.**	**Manufacturing process sheet**
COMPETENCY	4.E.b.i.	Defines a manufacturing process sheet as a set of steps to follow to machine the parts that make up a technical object
COMPETENCY	4.E.b.ii.	Follows a process and assembly sheet to construct an object consisting of few components or to construct part of that object

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.A.**	**Technology**
SUBSTRAND	**5.A.2.**	**Manufacturing**
COMPETENCY	**5.A.2.a.**	**Safely using machines and tools**
OBJECTIVE	5.A.2.a.i.	Uses tools safely (e.g. retractable utility knife, hammer, screwdriver, pliers)

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.A.**	**Technology**
SUBSTRAND	**5.A.2.**	**Manufacturing**
COMPETENCY	**5.A.2.b.**	**Measuring and laying out**
OBJECTIVE	5.A.2.b.iii.	Adopts the appropriate position for reading an instrument
OBJECTIVE	5.A.2.b.iv.	Marks the materials to be shaped using a pencil or punch

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.A.**	**Technology**
SUBSTRAND	**5.A.2.**	**Manufacturing**
COMPETENCY	**5.A.2.c.**	**Machining and forming**
OBJECTIVE	5.A.2.c.i.	Chooses the appropriate materials, tools, techniques and processes
OBJECTIVE	5.A.2.c.iii.	Immobilizes the part to be formed
OBJECTIVE	5.A.2.c.iv.	Forms the part in accordance with the steps in the following machining processes: sawing, drilling, sanding, filing

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.A.**	**Technology**

SUBSTRAND	**5.A.2.**	**Manufacturing**
COMPETENCY	**5.A.2.d.**	**Finishing**
OBJECTIVE	5.A.2.d.i.	Sands the sides or deburrs the edges of each part after forming
OBJECTIVE	5.A.2.d.ii.	Uses the appropriate finish (stain, paint)

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.A.**	**Technology**
SUBSTRAND	**5.A.2.**	**Manufacturing**
COMPETENCY	**5.A.2.e.**	**Assembling**
OBJECTIVE	5.A.2.e.ii.	Immobilizes parts during gluing
OBJECTIVE	5.A.2.e.iii.	Drills to the diameter of the screws, nails or rivets used
OBJECTIVE	5.A.2.e.iv.	Countersinks the openings for countersunk screws

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.A.**	**Technology**
SUBSTRAND	**5.A.2.**	**Manufacturing**
COMPETENCY	**5.A.2.f.**	**Assembling and disassembling**
OBJECTIVE	5.A.2.f.i.	Identifies and gathers the parts and hardware
OBJECTIVE	5.A.2.f.ii.	Chooses the appropriate tools
OBJECTIVE	5.A.2.f.iii.	For disassembly, numbers and records the location of the parts

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.B.**	**Science**
SUBSTRAND	**5.B.d.**	**Using measuring instruments**
COMPETENCY	5.B.d.i.	Adopts the appropriate position for reading an instrument

STRAND	**QC.5.**	**General Education Path: Techniques**
STANDARD	**5.B.**	**Science**
SUBSTRAND	**5.B.e.**	**Using observational instruments**
COMPETENCY	5.B.e.i.	Uses observational instruments appropriately (e.g. magnifying glass, stereomicroscope, binoculars, microscope)

STRAND	**QC.6.**	**General Education Path: Strategies**
STANDARD	**6.A.**	**Exploration strategies**
SUBSTRAND	6.A.2.	Distinguishing between the different types of information useful for solving the problem

SUBSTRAND	6.A.8.	Exploring various ways of solving the problem
SUBSTRAND	6.A.11.	Taking into account the constraints involved in solving a problem or making an object (e.g. specifications, available resources, time allotted)
SUBSTRAND	6.A.13.	Using different types of reasoning (e.g. induction, deduction, inference, comparison, classification)
SUBSTRAND	6.A.14.	Using empirical approaches (e.g. trial and error, analysis, exploration using one's senses)
STRAND	**QC.6.**	**General Education Path: Strategies**
STANDARD	**6.B.**	**Instrumentation strategies**
SUBSTRAND	6.B.3.	Using technical design to illustrate a solution (e.g. diagrams, sketches, technical drawings)
SUBSTRAND	6.B.4.	Using different tools for recording information (e.g. diagrams, notes, graphs, procedures, logbook)
SUBSTRAND	6.B.5.	Using a variety of observational techniques and tools
SUBSTRAND	6.B.6.	Selecting suitable techniques or tools for observation
STRAND	**QC.6.**	**General Education Path: Strategies**
STANDARD	**6.C.**	**Analytical strategies**
SUBSTRAND	6.C.1.	Identifying the constraints and important elements related to the problem-solving situation
SUBSTRAND	6.C.2.	Dividing a complex problem into simpler subproblems
STRAND	**QC.6.**	**General Education Path: Strategies**
STANDARD	**6.D.**	**Communication strategies**
SUBSTRAND	6.D.1.	Using different means of communication to propose explanations or solutions (e.g. oral presentation, written presentation, procedure)
SUBSTRAND	6.D.3.	Exchanging information
SUBSTRAND	6.D.5.	Using tools to display information in various formats (e.g. data tables, graphs, diagrams)

Saskatchewan Curriculum

Science

Grade **7** - Adopted: **2009**

OUTCOME / COURSE	**SK.IE.**	**Life Science: Interactions within Ecosystems (IE)**
FOCUS	**IE7.4.**	**Analyze how ecosystems change in response to natural and human influences, and propose actions to reduce the impact of human behaviour on a specific ecosystem. [DM, CP]**
OUTCOME	IE7.4.g.	Be sensitive and responsible in maintaining a balance between human needs and a sustainable environment by considering both immediate and long-term effects of their course of action or stated position.

The Ontario Curriculum

Mathematics

Grade **7** - Adopted: **2020**

STRAND / COURSE		Ontario Mathematics Curriculum Expectations – Grade 7
STRAND / OVERALL EXPECTATION	**B.**	**NUMBER**
STAGE / SKILLS	**B2.**	**use knowledge of numbers and operations to solve mathematical problems encountered in everyday life**
SUB-ORGANIZER / SPECIFIC EXPECTATION		**Properties and Relationships**
EXPECTATION	B2.1.	use the properties and order of operations, and the relationships between operations, to solve problems involving whole numbers, decimal numbers, fractions, ratios, rates, and percents, including those requiring multiple steps or multiple operations

The Ontario Curriculum

Mathematics

Grade **8** - Adopted: **2020**

STRAND / COURSE		Ontario Mathematics Curriculum Expectations – Grade 8
STRAND / OVERALL EXPECTATION	**B.**	**NUMBER**
STAGE / SKILLS	**B2.**	**use knowledge of numbers and operations to solve mathematical problems encountered in everyday life**
SUB-ORGANIZER / SPECIFIC EXPECTATION		**Properties and Relationships**
EXPECTATION	B2.1.	use the properties and order of operations, and the relationships between operations, to solve problems involving rational numbers, ratios, rates, and percents, including those requiring multiple steps or multiple operations

The Ontario Curriculum

Science

Grade **7** - Adopted: **2022**

STRAND / COURSE		Science and Technology Grade 7
STRAND / OVERALL EXPECTATION	**STRAND A:**	**STEM Skills and Connections - Throughout Grade 7, in connection with the learning in the Life Systems, Matter and Energy, Structures and Mechanisms, and Earth and Space Systems strands, students will:**
STAGE / SKILLS	**A1.**	**STEM Investigation and Communication Skills: use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures**
SUB-ORGANIZER / SPECIFIC EXPECTATION	A1.3.	use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems
SUB-ORGANIZER / SPECIFIC EXPECTATION	A1.5.	communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes

STRAND / COURSE		Science and Technology Grade 7
STRAND / OVERALL EXPECTATION	**STRAND A:**	**STEM Skills and Connections - Throughout Grade 7, in connection with the learning in the Life Systems, Matter and Energy, Structures and Mechanisms, and Earth and Space Systems strands, students will:**
STAGE / SKILLS	**A2.**	**Coding and Emerging Technologies: use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields**
SUB-ORGANIZER / SPECIFIC EXPECTATION	A2.1.	write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs
SUB-ORGANIZER / SPECIFIC EXPECTATION	A2.2.	identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades

STRAND / COURSE		Science and Technology Grade 7
STRAND / OVERALL EXPECTATION	**STRAND A:**	**STEM Skills and Connections - Throughout Grade 7, in connection with the learning in the Life Systems, Matter and Energy, Structures and Mechanisms, and Earth and Space Systems strands, students will:**
STAGE / SKILLS	**A3.**	**Applications, Connections, and Contributions: demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences**
SUB-ORGANIZER / SPECIFIC EXPECTATION	A3.2.	investigate how science and technology can be used with other subject areas to address real-world problems

STRAND / COURSE		Science and Technology Grade 7
STRAND / OVERALL EXPECTATION	**STRAND B:**	**Life Systems - Interactions in the Environment By the end of Grade 7, students will:**
STAGE / SKILLS	**B1.**	**Relating Science and Technology to Our Changing World: assess the impact of human activities and technologies on the environment, and analyse ways to mitigate negative impacts and contribute to environmental sustainability**
SUB-ORGANIZER / SPECIFIC EXPECTATION	B1.1.	assess the impact of various technologies on the environment
SUB-ORGANIZER / SPECIFIC EXPECTATION	B1.2.	assess the effectiveness of various ways of mitigating the negative and enhancing the positive impact of human activities on the environment
SUB-ORGANIZER / SPECIFIC EXPECTATION	B1.3.	analyse how diverse First Nations, Métis, and Inuit practices and perspectives contribute to environmental sustainability, including by using approaches such as Two-Eyed Seeing

STRAND / COURSE		**Science and Technology Grade 7**
STRAND / OVERALL EXPECTATION	**STRAND B:**	**Life Systems - Interactions in the Environment By the end of Grade 7, students will:**
STAGE / SKILLS	**B2.**	**Exploring and Understanding Concepts: demonstrate an understanding of interactions between and among biotic and abiotic components in the environment**
SUB-ORGANIZER / SPECIFIC EXPECTATION	B2.8.	describe how different approaches to agriculture and to harvesting food from the natural environment can impact an ecosystem, and identify strategies that can be used to maintain and/or restore balance to ecosystems

STRAND / COURSE		**Science and Technology Grade 7**
STRAND / OVERALL EXPECTATION	**STRAND E:**	**Earth and Space Systems - Heat in the Environment By the end of Grade 7, students will:**
STAGE / SKILLS	**E1.**	**Relating Science and Technology to Our Changing World: assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources**
SUB-ORGANIZER / SPECIFIC EXPECTATION	E1.2.	analyse various social, economic, and environmental impacts, including impacts related to climate change, of using non-renewable and renewable sources of energy

STRAND / COURSE		**Science and Technology Grade 7**
STRAND / OVERALL EXPECTATION	**STRAND E:**	**Earth and Space Systems - Heat in the Environment By the end of Grade 7, students will:**
STAGE / SKILLS	**E2.**	**Exploring and Understanding Concepts: demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential for many natural processes within Earth's systems**
SUB-ORGANIZER / SPECIFIC EXPECTATION	E2.2.	demonstrate an understanding of various ways in which heat is generated
SUB-ORGANIZER / SPECIFIC EXPECTATION	E2.7.	describe the role of radiation in heating and cooling Earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere
SUB-ORGANIZER / SPECIFIC EXPECTATION	E2.8.	identify common sources of greenhouse gases, including sources resulting from human activity, and describe how humans can reduce emissions of these gases

The Ontario Curriculum

Science

Grade **8** - Adopted: **2022**

STRAND / COURSE		**Science and Technology Grade 8**

STRAND / OVERALL EXPECTATION	**STRAND A:**	**STEM Skills and Connections - Throughout Grade 8, in connection with the learning in the Life Systems, Matter and Energy, Structures and Mechanisms, and Earth and Space Systems strands, students will:**
STAGE / SKILLS	**A1.**	**STEM Investigation and Communication Skills: use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures**
SUB-ORGANIZER / SPECIFIC EXPECTATION	A1.3.	use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems
SUB-ORGANIZER / SPECIFIC EXPECTATION	A1.5.	communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes
STRAND / COURSE		**Science and Technology Grade 8**
STRAND / OVERALL EXPECTATION	**STRAND A:**	**STEM Skills and Connections - Throughout Grade 8, in connection with the learning in the Life Systems, Matter and Energy, Structures and Mechanisms, and Earth and Space Systems strands, students will:**
STAGE / SKILLS	**A2.**	**Coding and Emerging Technologies: use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields**
SUB-ORGANIZER / SPECIFIC EXPECTATION	A2.1.	write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action
SUB-ORGANIZER / SPECIFIC EXPECTATION	A2.2.	identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades
STRAND / COURSE		**Science and Technology Grade 8**
STRAND / OVERALL EXPECTATION	**STRAND A:**	**STEM Skills and Connections - Throughout Grade 8, in connection with the learning in the Life Systems, Matter and Energy, Structures and Mechanisms, and Earth and Space Systems strands, students will:**
STAGE / SKILLS	**A3.**	**Applications, Connections, and Contributions: demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences**
SUB-ORGANIZER / SPECIFIC EXPECTATION	A3.2.	investigate how science and technology can be used with other subject areas to address real-world problems
STRAND / COURSE		**Science and Technology Grade 8**
STRAND / OVERALL EXPECTATION	**STRAND C:**	**Matter and Energy - Fluids - By the end of Grade 8, students will:**
STAGE / SKILLS	**C1.**	**Relating Science and Technology to Our Changing World: analyse uses of various technologies that rely on the properties of fluids, and assess the impact of these technologies on society and the environment**

SUB-ORGANIZER / SPECIFIC EXPECTATION	C1.2.	assess the environmental and social impacts of fluid spills, including impacts on First Nations, Métis, and Inuit communities, and including the cost and technical challenges related to cleanup and remediation efforts