

## PAN-CANADIAN FRAMEWORK CURRICULUM CONNECTIONS

The chart below matches a selection of Facing Mars' experiences to the Pan-Canadian Framework for Science Education in Canada. Detailed curriculum expectations for each of those mentioned experiences can be downloaded from the Facing Mars website.

Grade Level	Life Science	Physical Science	Earth and Space Science
4	<b>Habitats and Communities</b> Life On Mars	<b>Light</b> Can you cope in a crisis?	<b>Rocks and Minerals</b> Life on Mars A bird's-eye view of Mars
5	<b>Healthy Body</b> What does Space do to your face? Whirl 'til you Hurl Can you handle the pressure?	<b>Properties and Changes of Materials</b> Gimme Shelter Can you handle the pressure?	<b>Weather</b> Fan a Martian Dust Storm
6	<b>Diversity of Life</b> Life on Mars	<b>Flight</b> Blast Off!	<b>Space</b> Can you do the Marswalk? Life on Mars A bird's-eye view of Mars Whirl 'til you Hurl
7	<b>Interactions Within Ecosystems</b> Life on Mars		<b>Earth's Crust</b> Can you do the Marswalk? A bird's-eye view of Mars
8	<b>Cells, Tissues, Organs and Systems</b> What does Space do to your face? Whirl 'til you Hurl		
9			<b>Space Explorations</b> Can you do the Marswalk? Fan a Martian Dust Storm Life on Mars Gimme Shelter A bird's-eye view of Mars Can you handle the pressure?
10	<b>Sustainability of Ecosystems</b> Life on Mars	<b>Motion</b> Blast Off!	
11/12		<b>Force, Motion and Work</b> Blast Off!	

		<b>Radioactivity and Modern Physics</b> Gimme Shelter <b>Energy and Momentum</b> Can you cope in a crisis?	
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FACING MARS



# A BIRD'S-EYE VIEW OF MARS

## Pan-Canadian Curriculum Connections

### Grade 4: Rocks, Minerals, and Erosion

- 105-1 identify examples of scientific questions and technological problems that are currently being studied
- 301-6 demonstrate a variety of methods of weathering and erosion
- 301-7 describe natural phenomena that cause rapid and significant changes to the landscape

### Grade 6: Space

- 105-6 describe how evidence must be continually questioned in order to validate scientific knowledge
- 106-3 describe examples of improvements to the tools and techniques of scientific investigation that have led to new discoveries
- 300-23 describe the physical characteristics of components of the solar system – specifically, the sun, planets, moons, comets, asteroids, and meteors

### Grade 7: Earth's Crust

- 110-4 describe examples of how scientific knowledge has evolved in light of new evidence
- 111-2 provide examples of technologies used in scientific research
- 208-2 identify questions to investigate arising from practical problems and issues
- 210-12 identify and evaluate potential applications of findings

### Grade 9: Space Exploration

- 109-3 describe and explain the role of experimentation, collecting evidence, finding relationships, proposing explanations, and imagination in the development of scientific knowledge
- 110-6 explain the need for new evidence in order to continually test existing theories
- 208-4 propose alternative solutions to a given practical problem, select one, and develop a plan

# BLAST OFF!

## Pan-Canadian Curriculum Connections

### Grade 6: Flight

- 104-3 demonstrate and explain the importance of selecting appropriate processes for investigating scientific questions and solving technological problems
- 104-5 describe how results of similar and repeated investigations may vary and suggest possible explanations for variations
- 105-3 describe examples of scientific questions and technological problems that have been addressed differently at different times
- 204-7 plan a set of steps to solve a practical problem and to carry out a fair test of a science-related idea
- 205-5 make observations and collect information that is relevant to a given question or problem
- 206-3 identify and suggest explanations for patterns and discrepancies in data
- 206-6 suggest improvements to a design or constructed object
- 206-9 identify new questions or problems that arise from what was learned

### Grade 10: Motion

- 114-3 evaluate the role of continued testing in the development and improvement of technologies
- 117-8 identify possible areas of further study related to science and technology
- 212-4 state a prediction and a hypothesis based on available evidence and background information
- 212-6 design an experiment and identify specific variables

### Grade 11/12: Physics: Force, Motion, and Work

- 116-2 analyse and describe examples where scientific understanding was enhanced or revised as a result of the invention of a technology
- 116-4 analyse and describe examples where technologies were developed based on scientific understanding
- 212-3 design an experiment identifying and controlling major variables
- 213-2 carry out procedures controlling the major variables and adapting or extending procedures where required
- 215-6 work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise

# CAN YOU COPE IN A CRISIS?

## Pan-Canadian Curriculum Connections

### Grade 4: Light

- 104-6 demonstrate that specific terminology is used in science and technology contexts
- 105-1 identify examples of scientific questions and technological problems that are currently being studied
- 204-7 plan a set of steps to solve a practical problem and to carry out a fair test of a science-related idea
- 205-4 select and use tools for measuring
- 205-5 make observations and collect information that is relevant to a given question or problem

### Grade 11/12: Energy and Momentum

- 114-4 identify various constraints that result in tradeoffs during the development and improvement of technologies
- 114-9 explain the importance of communicating the results of a scientific or technological endeavour, using appropriate language and conventions
- 212-1 identify questions to investigate that arise from practical problems and issues
- 212-3 design an experiment identifying and controlling major variables
- 212-8 evaluate and select appropriate instruments for collecting evidence and appropriate processes for problem solving, inquiring, and decision making

# CAN YOU DO THE MARSWALK?

## Pan-Canadian Curriculum Connections

### Grade 6: Space

- 107-15 describe scientific and technological achievements that are the result of contributions by people from around the world
- 300-23 describe the physical characteristics of components of the solar system – specifically, the sun, planets, moons, comets, asteroids, and meteors
- 301-21 describe how astronauts are able to meet their basic needs in space

### Grade 7: Earth's Crust

- 210-6 interpret patterns and trends in data, and infer and explain relationships among the variables (e.g., explain the relationship between catastrophic events and the contact areas of tectonic plates)
- 210-12 identify and evaluate potential applications of findings (e.g., identify examples such as the application of the knowledge of earthquakes to the development of building specifications)
- 311-1 explain the processes of mountain formation and the folding and faulting of Earth's surface
- 311-4 examine some of the catastrophic events, such as earthquakes or volcanic eruptions, that occur on or near Earth's surface

### Grade 9: Space Exploration

- 109-3 describe and explain the role of experimentation, collecting evidence, finding relationships, proposing explanations, and imagination in the development of scientific knowledge
- 109-11 relate personal activities and various scientific and technological endeavours to specific science disciplines and interdisciplinary study areas
- 111-5 describe the science underlying particular technologies designed to explore natural phenomena, extend human capabilities, or solve practical problems

# CAN YOU HANDLE THE PRESSURE?

## Pan-Canadian Curriculum Connections

### Grade 5: Meeting Basic Needs and Maintaining a Healthy Body

- 104-2 demonstrate and describe processes for investigating scientific questions and solving technological problems
- 107-2 describe and compare tools, techniques, and materials used by different people in their community and region to meet their needs
- 107-8 describe examples of technologies that have been developed to improve their living conditions

### Grade 5: Properties and Changes of materials

- 104-5 describe how results of similar and repeated investigations may vary and suggest possible explanations for variations
- 105-2 identify examples of scientific questions and technological problems addressed in the past
- 106-4 describe instances where scientific ideas and discoveries have led to new inventions and applications
- 107-8 describe examples of technologies that have been developed to improve their living conditions
- 205-5 make observations and collect information that is relevant to a given question or problem
- 300-10 identify properties such as texture, hardness, flexibility, strength, buoyancy, and solubility that allow materials to be distinguished from one another

### Grade 9: Space Exploration

- 109-3 describe and explain the role of experimentation, collecting evidence, finding relationships, proposing explanations, and imagination in the development of scientific knowledge
- 109-11 relate personal activities and various scientific and technological endeavours to specific science disciplines and interdisciplinary study areas
- 111-5 describe the science underlying particular technologies designed to explore natural phenomena, extend human capabilities, or solve practical problems
- 210-16 identify new questions and problems that arise from what was learned

# FAN A MARTIAN DUST STORM

## Pan-Canadian Curriculum Connections

### Grade 5: Weather

- 104-7 demonstrate the importance of using the languages of science and technology to communicate ideas, processes, and results
- 300-13 describe weather in terms of temperature, wind speed and direction, precipitation, and cloud cover
- 300-14 describe situations demonstrating that air takes up space, has weight, and expands when heated
- 303-21 relate the transfer of energy from the sun to weather conditions

### Grade 9: Space Exploration

- 208-4 propose alternative solutions to a given practical problem, select one, and develop a plan
- 210-16 identify new questions and problems that arise from what was learned
- 211-3 work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise

# GIMME SHELTER

## Pan-Canadian Curriculum Connections

### Grade 5: Properties and Changes of Materials

- 104-5 describe how results of similar and repeated investigations may vary and suggest possible explanations for variations
- 204-5 identify and control major variables in their investigations
- 204-7 plan a set of steps to solve a practical problem and carry out a fair test of a science-related idea
- 205-3 follow a given set of procedures
- 205-5 make observations and collect information that is relevant to a given question or problem

### Grade 9: Earth and Space Exploration

- 210-16 identify new questions and problems that arise from what was learned
- 211-5 defend a given position on an issue or problem, based on their findings
- 312-6 describe the effects of solar phenomena on Earth

### Grades 11/12: Radioactivity and Modern Physics

- 117-5 provide examples of how science and technology are an integral part of their lives and their community
- 214-15 propose alternative solutions to a given practical problem, identify the potential strengths and weaknesses of each, and select one as the basis for a plan
- 214-18 identify and evaluate potential applications of findings
- 329-5 describe sources of radioactivity in the natural and constructed environments

# LIFE ON MARS

## Pan-Canadian Curriculum Connections

### Grade 4: Habitats and Communities

- 104-6 demonstrate that specific terminology is used in science and technology contexts
- 105-1 identify examples of scientific questions and technological problems that are currently being studied
- 206-9 identify new questions or problems that arise from what was learned
- 302-2 describe how a variety of animals are able to meet their basic needs in their habitat

### Grade 4: Rocks, Minerals, and Erosion

- 105-1 identify examples of scientific questions and technological problems that are currently being studied
- 300-7 identify and describe rocks that contain records of Earth's history
- 301-7 describe natural phenomena that cause rapid and significant changes to the landscape

### Grade 6: Diversity of Life

- 104-8 demonstrate the importance of using the languages of science and technology to compare and communicate ideas, processes, and results
- 105-6 describe how evidence must be continually questioned in order to validate scientific knowledge
- 302-12 describe how micro-organisms meet their basic needs, including obtaining food, water, and air, and moving around

### Grade 6: Space

- 104-8 demonstrate the importance of using the languages of science and technology to compare and communicate ideas, processes, and results
- 105-6 describe how evidence must be continually questioned in order to validate scientific knowledge
- 106-3 describe examples of improvements to the tools and techniques of scientific investigation that have led to new discoveries

### **Grade 7: Interactions within Ecosystems**

- 109-1 describe the role of collecting evidence, finding relationships, and proposing explanations in the development of scientific knowledge
- 210-3 identify strengths and weaknesses of different methods of collecting and displaying data
- 210-12 identify and evaluate potential applications of findings

### **Grade 9: Space Exploration**

- 109-11 relate personal activities and various scientific and technological endeavours to specific science disciplines and interdisciplinary study areas
- 110-6 explain the need for new evidence in order to continually test existing theories
- 113-3 describe possible positive and negative effects of a particular scientific or technological development, and explain why a practical solution requires a compromise between competing priorities

### **Grade 10: Life Science: Sustainability of Ecosystems**

- 114-1 explain how a paradigm shift can change scientific world views
- 116-1 identify examples where scientific understanding was enhanced or revised as a result of the invention of a technology
- 118-1 compare the risks and benefits to society and the environment of applying scientific knowledge or introducing a technology

# WHAT DOES SPACE DO TO YOUR FACE?

## Pan-Canadian Curriculum Connections

### Grade 5: Life Science: Meeting Basic Needs and Maintaining a Healthy Body

- 205-7 record observations using a single word, notes in point form, sentences, and simple diagrams and charts
- 302-5 describe the structure and function of the major organs of the digestive, excretory, respiratory, circulatory, and nervous systems

### Grade 8: Life Science: Cells, Tissues, Organs, and Systems

- 304-7 explain structural and functional relationships between and among cells, tissues, organs, and systems in the human body
- 304-9 describe the basic factors that affect the functions and efficiency of the human respiratory, circulatory, digestive, excretory, and nervous systems
- 304-10 describe examples of the interdependence of various systems of the human body

# WHIRL 'TIL YOU HURL

## Pan-Canadian Curriculum Connections

### Grade 5: Meeting basic needs and maintaining a healthy body

- 104-2 demonstrate and describe processes for investigating scientific questions and solving technological problems
- 106-2 describe examples of tools and techniques that have contributed to scientific discoveries
- 302-6 demonstrate how the skeletal, muscular, and nervous systems work together to produce movement

### Grade 6: Space

- 106-3 describe examples of improvements to the tools and techniques of scientific investigation that have led to new discoveries
- 107-15 describe scientific and technological achievements that are the result of contributions by people from around the world
- 301-21 describe how astronauts are able to meet their basic needs in space

### Grade 8: Cells, tissues, organs, and systems

- 111-5 describe the science underlying particular technologies designed to explore natural phenomena, extend human capabilities, or solve practical problems
- 304-7 explain structural and functional relationships between and among cells, tissues, organs, and systems in the human body
- 304-9 describe the basic factors that affect the functions and efficiency of the human respiratory, circulatory, digestive, excretory, and nervous systems
- 304-10 describe examples of the interdependence of various systems of the human body