

Science

Key for "Province":

Bold type – BC Big Ideas

Regular type – BC curricular content (K-8)

Topics	Gr	North American Division	Province:
Life Sciences	6-8	<i>Molecules to Organisms: Structures and Processes:</i> S.6-8.LS.1 Conduct an investigation to provide evidence that living things are made of cells, either one cell or many different numbers and types of cells. (MS-LS1-1)	(8) Life processes are performed at the cellular level: characteristics of life, and cell theory and types of cells <ul style="list-style-type: none"> • Make observations aimed at identifying their own questions about the natural world • Measure and control variables through fair tests • Use scientific understandings to identify relationships and draw conclusions co-operatively design projects • Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate.
		<i>Molecules to Organisms, cont:</i> S.6-8.LS.2 Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. (MS-LS1-2)	(8) Life processes are performed at the cellular level: characteristics of life, and cell theory and types of cells <ul style="list-style-type: none"> • Collaboratively plan a range of investigation types, including field work and experiments, to answer their questions or solve problems • Demonstrate an understanding and appreciation of evidence • Co-operatively design projects
		<i>Molecules to Organisms, cont:</i> S.6-8.LS.3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. (MS-LS1-3))	(6) Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment <ul style="list-style-type: none"> • Make observations in familiar or unfamiliar contexts • Observe, measure, and record data, using appropriate tools, including digital technologies • Communicate ideas, explanations, and processes in a variety of ways (8) Life processes are performed at the cellular level: the relationship of micro-organisms with living things <ul style="list-style-type: none"> • Make observations aimed at identifying their own questions about the natural world • Formulate alternative "if...then..." hypotheses based on their questions • Construct and use a range of methods to represent patterns or relationship in data, including tables, graphs, keys, models, and digital technologies as appropriate
		<i>Molecules to Organisms, cont:</i> S.6-8.LS.4 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors (e.g., nest building, herding, vocalization,	(6) Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment

	<p>colorful plumage) and specialized plant structures (e.g., bright flowers, flower nectar, odors that attract insects that transfer pollen, hard shells on nuts that squirrels bury) affect the probability of successful reproduction of animals and plants respectively. (MS-LS1-4)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: survival needs and natural selection</p> <ul style="list-style-type: none"> • Seek patterns and connections in data from their own investigations and secondary sources • Use scientific understandings to identify relationships and draw conclusions • Consider social, ethical, and environmental implications of the findings from their own and others' investigations
	<p><i>Molecules to Organisms, cont:</i> S.6-8.LS.5 Construct a scientific explanation based on evidence (e.g., drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, fish growing larger in large ponds) for how environmental (e.g., availability of food, light, space, water) and genetic (e.g., large breed cattle and species of grass affecting growth) factors influence the growth of organisms. (MS-LS1-5)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <p>(8) Life processes are performed at the cellular level</p> <ul style="list-style-type: none"> • Seek patterns and connections in data from their own investigations and secondary sources • Use scientific understandings to identify relationships and draw conclusions • Consider social, ethical, and environmental implications of the findings from their own and others' investigations
	<p><i>Molecules to Organisms, cont:</i> S.6-8.LS.6 Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. (MS-LS1-6)</p>	<p>(8) Life processes are performed at the cellular level: photosynthesis and cellular respiration</p> <ul style="list-style-type: none"> • Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest • Identify a question to answer or a problem to solve through scientific inquiry • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate • Use scientific understandings to identify relationships and draw conclusions
	<p><i>Molecules to Organisms, cont:</i> S.6-8.LS.7 Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism. (MS-LS1-7)</p>	<p>(6) Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment</p> <p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <p>(8) Life processes are performed at the cellular level</p> <ul style="list-style-type: none"> • Make predictions about the findings of their inquiry • Co-operatively design projects • Demonstrate an understanding and appreciation of evidence • Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate

	<p><i>Molecules to Organisms, cont:</i> S.6-8.LS.8 Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. (MS-LS1-8)</p>	<p>(6) Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment</p> <ul style="list-style-type: none"> • Make observations aimed at identifying their own questions about the natural world • Observe, measure, and record data • Seek patterns and connections in data from their own investigations and secondary sources
	<p><i>Ecosystems: Interactions, Energy, and Dynamics:</i> S.6-8.LS.9 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. (MS-LS2-1)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <ul style="list-style-type: none"> • Experience and interpret the local environment • Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information • Identify possible sources of error and suggest improvements to their investigation methods • Consider social, ethical, and environmental implications of the findings from their own and others' investigations
	<p><i>Ecosystems, cont:</i> S.6-8.LS.10 Construct an explanation that predicts patterns of interactions (e.g., competitive, predatory, mutually beneficial) among organisms across multiple ecosystems. (MS-LS2-2)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <p>(8) Life processes are performed at the cellular level</p> <ul style="list-style-type: none"> • Experience and interpret the local environment • Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information • Identify possible sources of error and suggest improvements to their investigation methods • Consider social, ethical, and environmental implications of the findings from their own and others' investigations
	<p><i>Ecosystems, cont:</i> S.6-8.LS.11 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (MS-LS2-3)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <ul style="list-style-type: none"> • Make predictions about the findings of their inquiry • Co-operatively design projects • Demonstrate an understanding and appreciation of evidence • Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate

	<p><i>Ecosystems, cont:</i> S.6-8.LS.12 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. (MS-LS2-4)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <ul style="list-style-type: none"> • Experience and interpret the local environment • Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information • Identify possible sources of error and suggest improvements to their investigation methods • Consider social, ethical, and environmental implications of the findings from their own and others' investigations
	<p><i>Ecosystems, cont:</i> S.6-8.LS.13 Evaluate competing design solutions (e.g., scientific, economic, social considerations) for maintaining biodiversity and ecosystem services (e.g., water purification, nutrient recycling, soil erosion prevention, habitat enhancement). (MS-LS2-5)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <ul style="list-style-type: none"> • Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest • Seek patterns and connections in data from their own investigations and secondary sources • Use scientific understandings to identify relationships and drawing conclusions • Demonstrate an understanding an appreciation of evidence • Consider social, ethical, and environmental implications of the findings from their own and others' investigations • Transfer and apply learning to new situations
	<p><i>Heredity: Inheritance and Variation of Traits:</i> S.6-8.LS.14 Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. (MS-LS3-1)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <ul style="list-style-type: none"> • Make observations aimed at identifying their own questions about the natural world • Collaboratively plan a range of investigation types to answer their questions • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate
	<p><i>Heredity, cont:</i> S.6-8.LS.15 Develop and use a model (e.g., Punnett squares, diagrams, simulations) to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. (MS-LS3-2)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <p>(8) Life processes are performed at the cellular level</p> <ul style="list-style-type: none"> • Make observations aimed at identifying their own questions about the natural world

			<ul style="list-style-type: none"> • Collaboratively plan a range of investigation types to answer their questions • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate
		<p><i>Life: Origins, Unity, and Diversity:</i> S.6-8.LS.16 Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth, comparing and contrasting creationist and naturalist perspectives. (MS-LS4-1)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <ul style="list-style-type: none"> • Experience and interpret the local environment • Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information • Identify possible sources of error and suggest improvements to their investigation methods • Consider social, ethical, and environmental implications of the findings from their own and others' investigations
		<p><i>Life: Origins, Unity, and Diversity, cont:</i> S.6-8.LS.17 Apply scientific principles to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms, comparing and contrasting creationist and naturalist perspectives. (MS-LS4-2)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <p>(8) Life processes are performed at the cellular level</p> <ul style="list-style-type: none"> • Experience and interpret the local environment • Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate • Consider social, ethical, and environmental implications of the findings from their own and others' investigations
		<p><i>Life: Origins, Unity, and Diversity, cont:</i> S.6-8.LS.18 Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. (MS-LS4-4)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <ul style="list-style-type: none"> • Experience and interpret the local environment • Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate • Consider social, ethical, and environmental implications of the findings from their own and others' investigations

		<p><i>Life: Origins, Unity, and Diversity, cont:</i> S.6-8.LS.19 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. (MS-LS4-5)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <ul style="list-style-type: none"> Identify a question to answer or a problem to solve through scientific inquiry Seek patterns and connections in data from their own investigations and secondary sources Demonstrate an understanding and appreciation of evidence
		<p><i>Life: Origins, Unity, and Diversity, cont:</i> S.6-8.LS.20 Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. (MS-LS4-6)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <ul style="list-style-type: none"> Measure and control variables through fair tests Seek patterns and connections in data from their own investigations and secondary sources Use scientific understandings to identify relationships and draw conclusions
		<p><i>Life: Origins, Unity, and Diversity, cont:</i> S.6-8.LS.21 Apply scientific principles to construct and share a personal model that explains origins of life on earth and acknowledges God as the Creator.</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time, survival needs, natural selection</p> <ul style="list-style-type: none"> Co-operatively design projects Demonstrate an understanding and appreciation of evidence Contribute to care for self, others, community, and world through personal or collaborative approaches Express and reflect on a variety of experiences and perspectives of place
Earth and Space Sciences	6-8	<p><i>Earth's Systems:</i> S.6-8.ES.1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. (MS-ESS2-1)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things</p> <p>(8) The theory of plate tectonics is the unifying theory that explains Earth's geological processes</p> <ul style="list-style-type: none"> Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate Use scientific understandings to identify relationships and draw conclusions Co-operatively design projects
		<p><i>Earth's Systems, cont:</i> S.6-8.ES.2 Construct an explanation based on evidence for how geoscience processes (e.g., surface weathering and deposition by movements of water, ice, and wind) have changed Earth's surface at varying time and spatial scales (e.g., slow plate motions, uplift of large mountain ranges, rapid landslides, microscopic geochemical reactions). (MS-ESS2-2)</p>	<p>(8) The theory of plate tectonics is the unifying theory that explains Earth's geological processes: plate tectonic movement major geological events, First Peoples knowledge, and layers of Earth</p> <ul style="list-style-type: none"> Collaboratively plan a range of investigation types, including field work and experiments, to answer their questions or solve problems they have identified

		<ul style="list-style-type: none"> • Use scientific understandings to identify relationships and draw conclusions • Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate
	<p><i>Earth's Systems, cont:</i> S.6-8.ES.3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. (MS-ESS2-3)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time</p> <ul style="list-style-type: none"> • Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest • Make observations aimed at identifying their own questions about the natural world • Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information • Exercise a healthy, informed skepticism and use scientific knowledge and findings from their own investigations to evaluate claims in secondary sources
	<p><i>Earth's Systems, cont:</i> S.6-8.ES.4 Develop a model (conceptual or physical) to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. (MS-ESS2-4)</p>	<p>(6) Newton's three laws of motion describe the relationship between force and motion: force of gravity (7) The electromagnetic force produces both electricity and magnetism</p> <ul style="list-style-type: none"> • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate • Use scientific understandings to identify relationships and draw conclusions • Co-operatively design projects
	<p><i>Earth's Systems, cont:</i> S.6-8.ES.5 Collect data (e.g., weather maps, diagrams, visualizations, laboratory experiments) to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions. (MS-ESS2-5)</p>	<p>(7) Earth and its climate have changed over geological time: fossil records, First Peoples knowledge, climate change and recent impacts</p> <ul style="list-style-type: none"> • Observe, measure, and record data, using equipment, including digital technologies, with accuracy and precision • Apply First Peoples perspectives and knowledge, and other ways of knowing, and local knowledge as sources of information • Seek patterns and connections in data from their own investigations and secondary sources
	<p><i>Earth's Systems, cont:</i> S.6-8.ES.6 Develop and use a model (e.g., diagrams, maps and globes, digital representations) to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. (MS-ESS2-6)</p>	<p>(7) Earth and its climate have changed over geological time: fossil records, First Peoples knowledge, climate change and recent impacts</p> <ul style="list-style-type: none"> • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate • Use scientific understandings to identify relationships and draw conclusions

		<ul style="list-style-type: none"> • Co-operatively design projects • Express and reflect on a variety of experiences and perspectives of place
	<p><i>Earth and Human Activity:</i> S.6-8.ES.7 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the results of past and current geoscience processes (e.g., plate tectonics, the Flood). (MS-ESS3-1)</p>	<p>(7) Earth and its climate have changed over geological time: fossil records (8) The theory of plate tectonics is the unifying theory that explains Earth’s geological processes: plate tectonic movement major geological events, First Peoples knowledge, and layers of Earth</p> <ul style="list-style-type: none"> • Identify a question to answer or a problem to solve through scientific inquiry • Co-operatively design projects • Generate and introduce new or refined ideas when problem solving • Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate
	<p><i>Earth and Human Activity, cont:</i> S.6-8.ES.8 Analyze and interpret data (e.g., locations, magnitudes, frequencies) on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. (MS-ESS3-2)</p>	<p>(7) Earth and its climate have changed over geological time: fossil records, First Peoples knowledge, climate change and recent impacts (8) The theory of plate tectonics is the unifying theory that explains Earth’s geological processes: plate tectonic movement major geological events, First Peoples knowledge, and layers of Earth</p> <ul style="list-style-type: none"> • Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest • Make observations aimed at identifying their own questions about the natural world • Seek patterns and connections in data from their own investigations and secondary sources • Exercise a healthy, informed skepticism and use scientific knowledge and findings from their own investigations to evaluate claims in secondary sources
	<p><i>Earth and Human Activity, cont:</i> S.6-8.ES.9 Apply scientific principles to design a method for monitoring and minimizing a human impact (e.g., water usage, soil usage, pollution) on the environment. (MS-ESS3-3)</p>	<p>(7) Earth and its climate have changed over geological time: fossil records, First Peoples knowledge, climate change and recent impacts</p> <ul style="list-style-type: none"> • Formulate alternative “If...then...” hypotheses based on their questions • Consider social, ethical, and environmental implications of the findings from their own and others’ investigations • Transfer and apply learning to new situations
	<p><i>Earth and Human Activity, cont:</i> S.6-8.ES.10 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth’s systems. (MS-ESS3-4)</p>	<p>(7) Earth and its climate have changed over geological time: fossil records, First Peoples knowledge, climate change and recent impacts</p> <ul style="list-style-type: none"> • Identify a question to answer or a problem to solve through scientific inquiry • Use scientific understandings to identify relationships and draw conclusions

		<ul style="list-style-type: none"> Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate
	<p><i>Earth and Human Activity, cont:</i> S.6-8.ES.11 Ask questions to clarify evidence (e.g., tables, graphs, maps of global and regional temperatures, atmospheric levels of gases, rates of human activities) of the factors that have caused the rise in global temperatures over the past century (e.g., fossil fuel combustion, cement production, agricultural activity, change in incoming solar radiation, volcanic activity). (MS-ESS3-5)</p>	<p>(7) Earth and its climate have changed over geological time: fossil records, First Peoples knowledge, climate change and recent impacts (8) The theory of plate tectonics is the unifying theory that explains Earth’s geological processes: plate tectonic movement major geological events, First Peoples knowledge, and layers of Earth</p> <ul style="list-style-type: none"> Collaboratively plan a range of investigation types, including field work and experiments, to answer their questions or solve problems they have identified Use scientific understandings to identify relationships and draw conclusions Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information Demonstrate an understanding and appreciation of evidence
	<p><i>Earth’s Place in the Universe:</i> S.6-8.ES.12 Develop and use a model (physical, graphical, or conceptual) of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. (MS-ESS1-1)</p>	<p>(6) The solar system is part of the Milky Way, which is one of billions of galaxies: the position, motion, and components of our solar system in our galaxy</p> <ul style="list-style-type: none"> Identify questions to answer or problems to solve through scientific inquiry Choose appropriate data to collect to answer their questions Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data
	<p><i>Earth’s Place in the Universe, cont:</i> S.6-8.ES.13 Develop and use a model (physical or conceptual) to describe the role of gravity in the motions within galaxies and the solar system. (MS-ESS1-2)</p>	<p>(6) The solar system is part of the Milky Way, which is one of billions of galaxies: the position, motion, and components of our solar system in our galaxy</p> <ul style="list-style-type: none"> Make observations in familiar or unfamiliar contexts Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data Demonstrate an understanding and appreciation of evidence
	<p><i>Earth’s Place in the Universe, cont:</i> S.6-8.ES.14 Analyze and interpret data (e.g., statistical information, drawings and photographs, models) to determine scale properties (e.g., size, surface features, orbital radius) of objects in the solar system. (MS-ESS1-3)</p>	<p>(6) The solar system is part of the Milky Way, which is one of billions of galaxies: the position, motion, and components of our solar system in our galaxy</p> <ul style="list-style-type: none"> Make observations in familiar or unfamiliar contexts Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data Demonstrate an understanding and appreciation of evidence

		<p><i>Earth's Place in the Universe, cont:</i> S.6-8.ES.15 Apply scientific principles to construct an explanation, based on evidence from rock strata, for how the geologic column is used to organize Earth's relative age and geologic history, comparing and contrasting creationist and naturalistic perspectives. (MS-ESS1-4)</p>	<p>(7) Evolution by natural selection provides an explanation for the diversity and survival of living things: organisms have evolved over time</p> <ul style="list-style-type: none"> • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate • Identify possible sources of error and suggest improvements to their investigation methods • Contribute to care for self, others, community, and world through personal or collaborative approaches • Communicate ideas, finding, and solutions to problems, using scientific language, representations, and digital technologies as appropriate
Physical Sciences	6-8	<p><i>Matter and Its Interactions:</i> S.6-8.PS.1 Develop models (e.g., drawings, 3D ball and stick structures, computer representations) to describe the atomic composition of simple molecules (e.g., ammonia, methanol) and extended structures (e.g., sodium chloride, diamonds). (MS-PS1-1)</p>	<p>(7) Elements consist of one type of atom, and compounds consist of atoms of different elements chemically combined</p> <p>(8) The behaviour of matter can be explained by the kinetic molecular theory and atomic theory</p> <ul style="list-style-type: none"> • Identify a question to answer or a problem to solve through scientific inquiry • Measure and control variables through fair tests • Use appropriate SI units and perform simple unit conversions • Reflect on their investigation methods, including the adequacy of controls on variables and the quality of the data collected • Co-operatively design projects • Express and reflect on a variety of experiences and perspectives of place
		<p><i>Matter and Its Interactions, cont:</i> S.6-8.PS.2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction (e.g., burning sugar or steel wool, fat reacting with sodium hydroxide, mixing zinc with hydrogen chloride) has occurred. (MS-PS1-2)</p>	<p>(7) Elements consist of one type of atom, and compounds consist of atoms of different elements chemically combined: chemical changes</p> <ul style="list-style-type: none"> • Demonstrate a sustained curiosity about a scientific topic or problem • Use equipment and materials safely, identifying potential risks • Compare data with predictions and develop explanations for results
		<p><i>Matter and Its Interactions, cont:</i> S.6-8.PS.3 Gather and make sense of information to describe that synthetic materials come from natural resources and impact society (e.g., new medicines, foods, alternative fuels). (MS-PS1-3)</p>	<p>(6) Everyday materials are often mixtures: heterogeneous mixtures, First Peoples knowledge of separation and extraction methods</p> <ul style="list-style-type: none"> • Choose appropriate data to collect to answer questions • Compare data with predictions and develop explanations for results • Demonstrate an understanding and appreciation of evidence
		<p><i>Matter and Its Interactions, cont:</i></p>	<p>(7) Elements consist of one type of atom, and compounds consist of atoms of different elements</p>

	<p>S.6-8.PS.4 Develop a model (e.g., drawings, diagrams) that predicts and describes changes in particle (e.g., molecules, inert atoms) motion, temperature, and state of a pure substance (e.g., water, carbon dioxide, helium) when thermal energy is added or removed. (MS-PS1-4)</p>	<p>chemically combined: pure substances, crystalline structure of solids, and chemical changes (8) The behaviour of matter can be explained by the kinetic molecular theory and atomic theory: kinetic molecular theory; atomic theory; and protons, neutrons, and quarks</p> <ul style="list-style-type: none"> • Make predictions about the findings of their inquiry • Measure and control variables through fair tests • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate
	<p><i>Matter and Its Interactions, cont:</i> S.6-8.PS.5 Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. (MS-PS1-5)</p>	<p>(8) The behaviour of matter can be explained by the kinetic molecular theory and atomic theory</p> <ul style="list-style-type: none"> • Make predictions about the findings of their inquiry • Measure and control variables through fair tests • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate
	<p><i>Matter and Its Interactions, cont:</i> S.6-8.PS.6 Design, construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes. (MS-PS1-6)</p>	<p>(7) Elements consist of one type of atom, and compounds consist of atoms of different elements chemically combined: chemical changes (8) Energy can be transferred as both a particle and a wave</p> <ul style="list-style-type: none"> • Collaboratively plan a range of investigation types, including filed work and experiments, to answer their questions or solve problems they have identified • Ensure that safety and ethical guidelines are followed in their investigations • Identify possible sources or error and suggest improvements to their investigation methods • Contribute to care for self, others, community, and world through personal or collaborative approaches
	<p><i>Motion and Stability: Forces and Interactions:</i> S.6-8.PS.7 Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects (e.g., two cars, car and stationary objects, meteor and space vehicle). (MS-PS2-1)</p>	<p>(6) Newton’s three laws of motion describe the relationship between force and motion: balanced and unbalanced forces, and force of gravity</p> <ul style="list-style-type: none"> • Identify questions to answer or problems to solve through scientific inquiry • Observe, measure, and record data, using appropriate tools, including digital technologies • Evaluate whether their investigations were fair tests • Communicate ideas, explanations, and processes in a variety of ways

	<p><i>Motion and Stability: Forces and Interactions, cont:</i> S.6-8.PS.8 Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. (MS-PS2-2)</p>	<p>(6) Newton's three laws of motion describe the relationship between force and motion: balanced and unbalanced forces, and force of gravity</p> <ul style="list-style-type: none"> • Identify questions to answer or problems to solve through scientific inquiry • Observe, measure, and record data, using appropriate tools, including digital technologies • Evaluate whether their investigations were fair tests • Communicate ideas, explanations, and processes in a variety of ways
<p><i>Motion and Stability: Forces and Interactions, cont:</i> S.6-8.PS.9 Ask questions about data (e.g., effect of the number of turns of wire on the strength of an electromagnet, effect of increasing the number or strength of magnets on speed of an electric motor) to determine the factors that affect the strength of electric and magnetic forces (e.g., electromagnets, electric motors, generators). (MS-PS2-3)</p>	<p>(7) The electromagnetic force produces both electricity and magnetism: generated in different ways and electromagnetism</p> <ul style="list-style-type: none"> • Identify questions to answer or problems to solve through scientific inquiry • Choose appropriate data to collect to answer their questions • Identify patterns and connections in data • Demonstrate an understanding and appreciation of evidence 	
<p><i>Motion and Stability: Forces and Interactions, cont:</i> S.6-8.PS.10 Construct and present arguments using evidence (e.g., data generated from simulations or digital tools; charts displaying mass, strength of interaction, distance from the Sun, orbital periods of objects within the solar system) to support the claim that gravitational interactions exert attraction and depend on the masses of interacting objects. (MS-PS2-4)</p>	<p>(6) The solar system is part of the Milky Way, which is one of billions of galaxies: the position, motions and components of our solar system (7) The electromagnetic force produces both electricity and magnetism: generated in different ways and electromagnetism</p> <ul style="list-style-type: none"> • Choose appropriate data to collect to answer their questions • Observe, measure, and record data, using appropriate tools, including digital technologies • Communicate ideas, explanations and processes in a variety of ways 	
<p><i>Motion and Stability: Forces and Interactions, cont:</i> S.6-8.PS.11 Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact (e.g., interactions of magnets, electrically-charged strips of tape, electrically-charged pith balls). (MS-PS2-5)</p>	<p>(7) The electromagnetic force produces both electricity and magnetism: generated in different ways and electromagnetism</p> <ul style="list-style-type: none"> • Identify questions to answer or problems to solve through scientific inquiry • Use equipment and materials safely, identifying potential risks • Observe, measure, and record data, using appropriate tools, including digital technologies • Evaluate whether their investigations were fair tests • Demonstrate an understanding and appreciation of evidence 	
<p><i>Energy:</i> S.6-8.PS.12 Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and the speed of an object (e.g., riding a bicycle at different speeds, rolling different sizes of rock downhill,</p>	<p>(8) The behaviour of matter can be explained by the kinetic molecular theory and atomic theory</p> <ul style="list-style-type: none"> • Collaboratively plan a range of investigation types, including field work and experiments, to answer their questions or solve problems they have identified 	

	<p>getting hit by a Wiffle® ball versus a tennis ball). (MS-PS3-1)</p>	<ul style="list-style-type: none"> • Ensure the safety and ethical guidelines are followed in their investigations • Use scientific understandings to identify relationships and draw conclusions • Transfer and apply learning to new situations
	<p><i>Energy, cont:</i> S.6-8.PS.13 Develop a model (e.g., representations, diagrams, pictures, written descriptions) to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system (e.g., the Earth and either a roller coaster cart at varying positions on a hill or objects at varying heights on shelves, changing direction/orientation of a magnet, balloon with static electrical charge brought close to a classmate’s hair). (MS-PS3-2)</p>	<p>(7) The electromagnetic force produces both electricity and magnetism: generated in different ways and electromagnetism (8) Energy can be transferred as both a particle and a wave: types and effects; properties and behaviours</p> <ul style="list-style-type: none"> • Collaboratively plan a range of investigation types, including field work and experiments, to answer their questions or solve problems they have identified • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate • Transfer and apply learning to new situations
	<p><i>Energy, cont:</i> S.6-8.PS.14 Apply scientific principles to design, construct, and test a device (e.g., insulated box, solar cooker, Styrofoam® cup) that either minimizes or maximizes thermal energy transfer. (MS-PS3-3)</p>	<p>(7) The electromagnetic force produces both electricity and magnetism: generated in different ways and electromagnetism (8) Energy can be transferred as both a particle and a wave: types and effects; properties and behaviours</p> <ul style="list-style-type: none"> • Identify questions to answer or problems to solve through scientific inquiry • Use equipment and materials safely, identifying potential risks • Observe, measure, and record data, using appropriate tools, including digital technologies • Demonstrate an understanding and appreciation of evidence
	<p><i>Energy, cont:</i> S.6-8.PS.15 Plan an investigation (e.g., comparing final water temperatures after different masses of ice are melted in the same volume of water with the same initial temperature) to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. (MS-PS3-4)</p>	<p>(8) The behaviour of matter can be explained by the kinetic molecular theory and atomic theory</p> <ul style="list-style-type: none"> • Identify questions to answer or problems to solve through scientific inquiry • Use equipment and materials safely, identifying potential risks • Observe, measure, and record data, using appropriate tools, including digital technologies • Demonstrate an understanding and appreciation of evidence • Transfer and apply learning to new situations
	<p><i>Energy, cont:</i> S.6-8.PS.16 Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. (MS-PS3-5)</p>	<p>(8) The behaviour of matter can be explained by the kinetic molecular theory and atomic theory</p> <ul style="list-style-type: none"> • Collaboratively plan a range of investigation types, including field work and experiments,

			<p>to answer their questions or solve problems they have identified</p> <ul style="list-style-type: none"> • Ensure the safety and ethical guidelines are followed in their investigations • Use scientific understandings to identify relationships and draw conclusions • Transfer and apply learning to new situations
		<p><i>Waves and their Applications in Technologies...:</i> S.6-8.PS.17 Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. (MS-PS4-1)</p>	<p>(8) Energy can be transferred as both a particle and a wave: electrons and leptons, types and effects</p> <ul style="list-style-type: none"> • Measure and control variables through fair tests • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate • Use appropriate SI units and perform simple unit conversions
		<p><i>Waves and their Applications, cont:</i> S.6-8.PS.18 Develop and use a model (e.g., drawings, simulations, written descriptions) to describe that waves are reflected, absorbed, or transmitted through various materials. (MS-PS4-2)</p>	<p>(8) Energy can be transferred as both a particle and a wave: electrons and leptons, types and effects, and properties/behaviours/ways of sensing</p> <ul style="list-style-type: none"> • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate • Use scientific understandings to identify relationships and draw conclusions
		<p><i>Waves and their Applications, cont:</i> S.6-8.PS.19 Integrate qualitative scientific and technical information to support the claim that digitized signals (e.g., fiber optic cable transmits light pulses, radio wave pulses in Wi-Fi devices, conversion of stored binary patterns to make sound or text on a computer screen) are a more reliable way to encode and transmit information than analog signals. (MS-PS4-3)</p>	<p>(8) Energy can be transferred as both a particle and a wave: electrons and leptons, types and effects, and properties/behaviours/ways of sensing</p> <ul style="list-style-type: none"> • Observe, measure, and record data, using equipment, including digital technologies, with accuracy and precision • Seek patterns and connections in data from their own investigations and secondary sources • Demonstrate an understanding and appreciation of evidence
Engineering, Technology, and Applications of Science	6-8	<p><i>Engineering Design:</i> 5.DSP.1 Use basic operations to solve problems using a line plot to display a data set of measurement in fractions of a unit (halves, fourths, and eighths) (5.MD.2)</p>	<p>(6-8)</p> <ul style="list-style-type: none"> • Observe, measure, and record data, using equipment, including digital technologies, with accuracy and precision • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate
		<p><i>Engineering Design, cont:</i> 5.DSP.2 Find the mean, median, mode, and range of a given set of data</p>	<p>(6-8)</p> <ul style="list-style-type: none"> • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate • Use appropriate SI units and perform simple unit conversions

			<ul style="list-style-type: none"> • Use scientific understandings to identify relationships and draw conclusions
		<i>Engineering Design, cont:</i> 6.DSP.1 Develop understanding of statistical variability (6.SP.1,2,3)	(6-8) <ul style="list-style-type: none"> • Use scientific understandings to identify relationships and draw conclusions • Measure and control variables through fair tests • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate
		<i>Engineering Design, cont:</i> 6.DSP.2 Summarize and describe distributions (6.SP.4,5)	(6-8) <ul style="list-style-type: none"> • Demonstrate an understanding and appreciation of evidence • Communicate ideas, findings, and solutions to problems • Express and reflect on a variety of experiences and perspectives