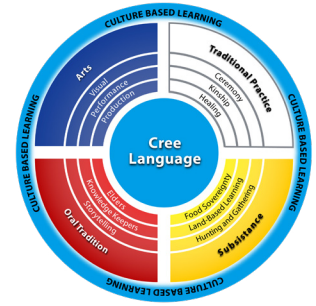







Science
























Knowledge	Understanding	Skills & Procedures	ᑭᓴᓴᓴᓴ Nehiyaw Ways of Knowing	Other Suggestions
ORGANIZING IDEA Matter(M) : Understandings of the physical world are deepened through investigating matter and energy.				
GUIDING QUESTION How can materials be managed safely?				
LEARNING OUTCOME 4M 1.1 Students investigate the management of waste and dangerous materials and describe environmental impact.				
<p>Methods of waste management that can negatively impact the environment include using landfills and burning.</p> <p>Methods of waste management that can reduce negative environmental impacts include</p> <ul style="list-style-type: none"> • reducing • reusing • recycling • repurposing • repairing • composting <p>Increased production and consumption of materials leads to increased production of waste materials.</p> <p>Waste materials may be solids, liquids, or gases.</p>	<p>Responsible methods of waste management can reduce negative environmental impacts.</p>	<p>Compare the different methods of waste management and discuss their environmental impacts.</p> <p>Develop a personal plan to reduce waste.</p> <p>Discuss local waste management programs.</p> <p>Represent a recycling process using diagrams.</p>	<p> Stewardship and Community – Sharing</p>	<p> Learn Alberta: Science Grade 4 Lesson Plan : Students learn about wastes produced through natural processes and human technology.</p>






















Knowledge	Understanding	Skills & Procedures	ᑭᐱᑦᑭᐱᑦ Nehiyaw Ways of Knowing	Other Suggestions
LEARNING OUTCOME				
4M 1.2 Students investigate management of waste materials and describe potential personal and environmental impacts.				
<p>Dangerous materials include natural and processed materials that can be harmful to the health of individuals.</p> <p>Symbols are used to identify dangerous materials.</p> <p>Hazard symbols are used to identify dangerous materials, including those that are</p> <ul style="list-style-type: none"> • explosive • flammable • corrosive • poisonous 	<p>Responsible use and disposal can reduce environmental impacts of dangerous materials.</p>	<p>Identify the hazard associated with symbols on various dangerous materials at home, at school, or in the community.</p> <p>Discuss responsible use and disposal of dangerous materials.</p>		
ORGANIZING IDEA				
Energy (E): Understandings of the physical world are deepened through investigating matter and energy.				
GUIDING QUESTION				
How can forces affect objects from a distance?				
LEARNING OUTCOME				
4E 1.1 Students investigate how forces can act on objects without contact.				
<p>Non-contact forces occur between objects that are not in direct contact.</p> <p>Gravity on Earth is a non-contact force that pulls objects toward the ground.</p> <p>Magnetic force is a non-contact force that attracts or repels magnetic materials.</p> <p>Magnetic materials contain iron, cobalt, or nickel.</p> <p>The strength of non-contact forces decreases as objects get farther apart.</p> <p>Non-contact forces can act through some materials.</p>	<p>Non-contact forces are invisible forces that can affect objects, materials, and substances.</p>	<p>Describe how non-contact forces affect objects.</p> <p>Demonstrate the effect of gravity on an object.</p> <p>Conduct an investigation to demonstrate magnetic forces on objects.</p>		

 Knowledge	Understanding	Skills & Procedures	ᑭᑭᑭᑭ Nehiyaw Ways of Knowing	Other Suggestions
LEARNING OUTCOME				
4E 1.2 Students investigate how forces can act on objects without contact.				
<p>Magnetic force is strongest at the magnetic poles.</p> <p>Magnets have two magnetic poles, known as north and south.</p> <p>Opposite magnetic poles attract each other and like magnetic poles repel each other.</p> <p>Both magnetic poles attract magnetic material.</p> <p>Some materials can become magnetized by interacting with a magnet.</p>	Magnets interact with each other and magnetic material.	Analyze interactions between the magnetic poles of magnets. Magnetize a material using a magnet.		
ORGANIZING IDEA				
Earth System (ES): Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.				
GUIDING QUESTION				
How does Earth sustain life?				
LEARNING OUTCOME				
4ES 1.1 Students investigate the systems of Earth and reflect on how interconnections sustain life.				
<p>Earth scientists call Earth's systems the spheres, including the</p> <ul style="list-style-type: none"> • lithosphere • atmosphere • hydrosphere • biosphere <p>The lithosphere</p> <ul style="list-style-type: none"> • is the outer layers of Earth's surface • is made of rocks • contains soils and minerals that support life <p>The atmosphere</p> <ul style="list-style-type: none"> • is a gas layer that surrounds Earth • warms Earth's surface • reduces extremes of temperature • contains oxygen, which is used for breathing <p>[...continued]</p>	Earth's systems interact with one another, resulting in environments that sustain life.	Make connections between human activity and Earth's systems. Analyze the interconnectedness of Earth's systems.	  7 Year Cycle	

 Knowledge	Understanding	Skills & Procedures	ᑕᑦᑎᑦᑎᑦᑎᑦ Nehiyaw Ways of Knowing	Other Suggestions
<p>[...continued]</p> <p>The hydrosphere is</p> <ul style="list-style-type: none"> all areas of Earth that are covered with water necessary for sustaining life <p>The biosphere includes all</p> <ul style="list-style-type: none"> life on Earth regions of Earth where life is supported <p>First Nations, Métis, and Inuit hold understandings of Earth systems that sustain life, including that all things are interconnected.</p>			<p>   Elk Harvest Series (5 videos)</p> <p>   Moose Harvest Series (Field Harvest – 6 videos; Butchering and Cutting – 9 videos; Fire Preparation – 3 videos; Feast – 3 videos)</p>	
LEARNING OUTCOME				
4ES 1.2 Students investigate the systems of Earth and reflect on how interconnections sustain life.				
<p>Organisms require warmth and energy from the Sun to live.</p> <p>Sunlight is more direct at the equator than at the poles.</p> <p>The long-term temperature at the equator is warmer than it is at the poles.</p> <p>In Alberta, sunlight is more direct, and the length of daylight is longer, in summer than in winter.</p>	<p>Earth’s surface is warmed by the Sun, allowing for life.</p>	<p>Describe the importance of the amount of sunlight and warmth on a variety of organisms.</p>	<p> Common Seasonal Activities – Seasonal Round</p> <p>  Legend of Night and Day</p>	
LEARNING OUTCOME				
4ES 1.3 Students investigate the systems of Earth and reflect on how interconnections sustain life.				
<p>Water is a basic need for plants and animals.</p> <p>Water provides habitat for many organisms.</p> <p>First Nations, Métis, and Inuit laws of nature honour water as being sacred because water sustains life.</p> <p>Laws of nature guide First Nations, Métis, and Inuit in their responsibility to protect water and sources of water.</p> <p>First Nations, Métis, and Inuit laws of nature include</p> <ul style="list-style-type: none"> how nature provides gifts of life living in harmony with the land 	<p>Caring for water and water sources is a shared responsibility.</p>	<p>Discuss ways that plants and animals use water to meet their basic needs.</p> <p>Identify plants and animals that exist in various bodies of water.</p> <p>Demonstrate respect for water in the local environment.</p> <p>Discuss the importance of water to First Nations, Métis, and Inuit.</p>	<p>  Legend of Raven and Water</p>	<p>  Water: the sacred relationship - website and videos</p> <p> “Nibi’s Water Song” by Sunshine Tenasco, 2019.</p> <p>  Water Walkers</p>

 Knowledge	Understanding	Skills & Procedures	ᑭᑦᑭᑦᑭᑦ Nehiyaw Ways of Knowing	Other Suggestions
LEARNING OUTCOME				
4ES 1.4 Students investigate the systems of Earth and reflect on how interconnections sustain life.				
<p>Changes in one system that can impact another system include changes in</p> <ul style="list-style-type: none"> • number of organisms • food sources • habitat • water distribution and cleanliness • weather patterns <p>Governments, conservation groups, and First Nations, Métis, and Inuit communities collaborate with Parks Canada to conserve, restore, and protect Canada's natural and cultural heritages through initiatives such as</p> <ul style="list-style-type: none"> • culture camps • science camps • land management and preservation of important sites • cultural centres 	<p>Earth's systems are interconnected and can be impacted by small changes.</p>	<p>Explain how changes in one system can have impacts on other systems.</p> <p>Discuss the importance of governments, conservation groups, and First Nations, Métis, and Inuit communities working alongside Parks Canada.</p>	 7 Year Cycle	<p>Parks Canada and Métis Nation series; example of the bison treaty; bison being returned to Nations by Elk Island National Park.</p>
LEARNING OUTCOME				
4ES 1.5 Students investigate the systems of Earth and reflect on how interconnections sustain life.				
<p>Natural resources are materials from nature that are used to meet human needs, and include</p> <ul style="list-style-type: none"> • air • water • soil • minerals • metals • forests • organisms 	<p>Earth's systems include natural resources that are central to human well-being.</p>	<p>Investigate natural resources found in Alberta and how they are used to meet human needs.</p>	 Plants and Trees – Animate/ Inanimate	 “Spirit Gifting” by Elmer Ghostkeeper, 2007.

Knowledge	Understanding	Skills & Procedures	ᑭᑭᑭᑭ Nehiyaw Ways of Knowing	Other Suggestions
LEARNING OUTCOME 4ES 1.6 Students investigate the systems of Earth and reflect on how interconnections sustain life.				
<p>Conservation is the preservation and protection of Earth's systems from pollution, depletion, or extinction.</p> <p>Conservation practices can be implemented in natural and human-made areas.</p> <p>Conservation can involve creating local, provincial, and national parks.</p> <p>First Nations, Métis, and Inuit have a long history with the land that has informed conservation practices and beliefs.</p>	<p>Conservation can impact land, natural resources, and organisms.</p> <p>Many First Nations, Métis, and Inuit practise traditional methods of conservation, including taking only what is needed.</p>	<p>Investigate conservation practices in natural and human-made areas.</p> <p>Discuss the interconnectedness between human use of parks and conservation practices.</p>	<p> Stewardship and Community – Sharing</p> <p>  Legend of Wolverine</p>	<p>  Canadian Geographic: Bison successfully reintroduced in Banff National Park</p> <p>  How Wolves Saved Yellowstone</p>
LEARNING OUTCOME 4ES 1.7 Students investigate the systems of Earth and reflect on how interconnections sustain life.				
<p>Conservation can be practised through personal actions, including</p> <ul style="list-style-type: none"> • use of electricity; e.g., turning off lights when leaving a room • use of water; e.g., taking shorter showers • reducing waste; e.g., using reusable packaging <p>Conservation can be practised through community or global actions, such as</p> <ul style="list-style-type: none"> • use of energy-efficient alternatives; e.g., solar panels • supplying water to support crops (irrigation) • community recycling or composting programs 	<p>Conservation can impact land, natural resources, and organisms.</p> <p>Many First Nations, Métis, and Inuit practise traditional methods of conservation, including taking only what is needed.</p>	<p>Describe examples of personal actions that contribute to conservation in daily life.</p> <p>Create a plan to implement a conservation practice in a local community.</p>	<p> Stewardship and Community – Sharing</p> <p>  Legend of Wolverine</p>	<p>  Canadian Geographic: Bison successfully reintroduced in Banff National Park</p> <p>  How Wolves Saved Yellowstone</p>

 Knowledge	Understanding	Skills & Procedures	ᑭᑦᑎᑦᑎᑦ Nehiyaw Ways of Knowing	Other Suggestions
ORGANIZING IDEA				
Living Systems (LS): Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.				
GUIDING QUESTION				
In what ways do the structures of organisms support survival?				
LEARNING OUTCOME				
4LS 1.1 Students analyze organisms and relate external structures to functions.				
<p>Organisms are living things that respond to stimuli and include plants, humans, and other animals.</p> <p>Organisms can be classified in various ways, including by</p> <ul style="list-style-type: none"> • appearance • habitat • structures <p>Structures, including body parts, are features of organisms that serve a purpose or function.</p> <p>Organisms have external structures that can vary; e.g.,</p> <ul style="list-style-type: none"> • plants may have roots, stems, leaves, flowers, fruit, or other structures • animals may have claws, teeth, legs, shells, skins, or other structures <p>Functions of external structures in an organism include</p> <ul style="list-style-type: none"> • eating • moving • protecting • sensing • reproducing 	<p>A variety of organisms live on Earth and have external structures that support various functions.</p>	<p>Find and classify examples of local plants and animals based on appearance, habitat, and structures.</p> <p>Demonstrate respect when interacting with plants and animals in local environments.</p> <p>Relate the external structures of plants to their functions.</p> <p>Relate the external structures of animals to their functions, excluding reproduction.</p> <p>Compare external structures of various plants and animals in relation to function.</p>	 <p>Harvesting Medicines Series: Protocol on Herb Gathering</p>  <p>Arrowhead Fingers</p>	 <p>Canadian Geographic: Indigenous Peoples Atlas of Canada: Traditional Métis Medicines</p>
LEARNING OUTCOME				
4LS 1.2 Students analyze organisms and relate external structures to functions.				
<p>Plants can detect sensory stimuli, such as light, gravity, temperature, and touch, which help them grow and survive.</p> <p>[continued...]</p>	<p>Organisms sense and respond to their environments to support growth and survival.</p>	<p>Discuss how plants respond to sensory stimuli.</p> <p>Relate sensory organs of animals to their survival.</p> <p>[continued...]</p>	 <p>The Legend of Weasel</p>	



Knowledge	Understanding	Skills & Procedures	ᑭᓴᓴᑦ Nehiyaw Ways of Knowing	Other Suggestions
<p>[continued...]</p> <p>Sensory organs of animals include</p> <ul style="list-style-type: none"> • ears • eyes • nose • tongue • skin <p>Sensory organs in animals help them meet their needs in various ways, such as by detecting</p> <ul style="list-style-type: none"> • food • other animals • danger • temperature 		<p>[continued...]</p> <p>Conduct an investigation to determine if an organism senses and responds to changes in an environment.</p>		

ORGANIZING IDEA








Space: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.















GUIDING QUESTION

How do objects in space impact daily life?

LEARNING OUTCOME




4S 1.1 Students investigate and describe objects in space in connection to daily life.


<p>The universe includes all of space and everything in it.</p> <p>Objects in space include</p> <ul style="list-style-type: none"> • the Moon • the Sun (a star) • stars and their planets • planets and their moons <p>Most objects in space are more easily observed at night.</p> <p>Technologies for viewing objects in space include</p> <ul style="list-style-type: none"> • binoculars • telescopes • planetariums <p>Safe viewing of the Sun requires appropriate safety equipment and precautions to avoid damage to the eyes.</p>	<p>Observing objects in space helps us connect Earth to its place in the universe.</p>	<p>Investigate and discuss how plants and animals respond to stimuli in their environments in order to survive.</p>	<p>  Legend of Night and Day</p> <p> 13 Moons</p> <p> Legend of Solstice</p>	<p> Lessons from the Earth and Beyond: Bringing Indigenous Knowledge Systems into the Classroom</p> <p>  Coyote Science website and TV show</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

 Knowledge	Understanding	Skills & Procedures	ᑭᑭᑭᑭ Nehiyaw Ways of Knowing	Other Suggestions
LEARNING OUTCOME				
4S 1.2 Students investigate and describe objects in space in connection to daily life.				
<p>Constellations are groups of stars that appear to form a shape.</p> <p>Constellations have names that come from a variety of sources.</p> <p>Stars in the same constellation may be millions of kilometres apart.</p> <p>Earth's daily rotation and yearly revolution around the Sun causes the constellations to appear in different locations at different times.</p> <p>Polaris, the North Star, shows the approximate direction of the North Pole.</p> <p>The Orion constellation can be used to find the South Pole.</p>	<p>Stars and constellations are recognizable from Earth and can be used for navigation and tracking the passage of time.</p>	<p>Examine constellations in relation to location in the sky.</p> <p>Explain ways in which stars can be used for navigation.</p> <p>Explore the local traditional names of the North Star.</p>	<p> Little Dipper or   7 Sisters Legend</p>	<p>  Tipiskawi Kisik: Night Sky Stories, a series by Wilfred Buck</p> <p>  Coyote Science website and TV show</p>
LEARNING OUTCOME				
4S 1.3 Students investigate and describe objects in space in connection to daily life.				
<p>The Moon has been used throughout history to measure time.</p> <p>The international standard (Gregorian) calendar is based on the amount of time it takes Earth to revolve around the Sun.</p> <p>Most people follow the international standard calendar in daily life.</p> <p>Some cultures may use a lunar calendar in addition to the international standard calendar.</p> <p>Lunar calendars follow patterns of the Moon for timekeeping.</p>	<p>Many cultures connect observations of objects in space to time, place, and daily life in various ways.</p>	<p>Represent observations of objects in space as they connect to seasons, plants, and animals in a local area.</p> <p>Discuss similarities and differences between a lunar calendar and the international standard calendar.</p>	<p>  Legend of Night and Day</p> <p>  13 Moons</p>	<p>  Saskatchewan Literacy: When the Trees Crackle with Cold website and supports</p>



Knowledge	Understanding	Skills & Procedures	ᑭᐱᑭᑦ Nehiyaw Ways of Knowing	Other Suggestions
ORGANIZING IDEA Computer Science (CS): Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.				
GUIDING QUESTION How can design meet needs?				
LEARNING OUTCOME 4CS 1.1 Students examine and apply design processes to meet needs.				
<p>Design processes include</p> <ul style="list-style-type: none"> • understanding the problem • forming ideas (ideating) • planning • creating • analyzing • testing • troubleshooting <p>Feedback helps to ensure all needs are considered during the design process.</p> <p>An algorithm is a sequence of instructions.</p> <p>Artifacts are objects or products made by humans, machines, or computers through the process of design.</p> <p>Design can produce many artifacts, including</p> <ul style="list-style-type: none"> • algorithms • models • prototypes • blueprints • programs • experiments • objects <p>Design can deal with complex problems.</p> <p>Availability of materials and costs are considerations in design.</p>	<p>Design involves processes that can transform ideas into artifacts that meet needs.</p>	<p>Plan and create an artifact to meet a need.</p> <p>Provide feedback to others during the design process.</p> <p>Test an artifact to confirm that it meets intended needs.</p> <p>Collaborate to design an algorithm to solve a problem.</p> <p>Examine availability and cost of materials during design.</p>		

Knowledge	Understanding	Skills & Procedures	ᑭᑦᑎᑦᑎᑦᑎᑦ Nehiyaw Ways of Knowing	Other Suggestions
ORGANIZING IDEA				
Scientific Method (SM): Investigation of the physical world is enhanced through the use of scientific methods that attempt to remove human biases and increase objectivity.				
GUIDING QUESTION				
How can evidence advance knowledge in science?				
LEARNING OUTCOME				
4SM 1.1 Students investigate evidence and reflect on its role in science.				
<p>Data can be descriptive and expressed using words (qualitative).</p> <p>Data can be measured and expressed using numbers and counts (quantitative).</p> <p>Descriptive and expressive oral narratives include numbers or counts.</p> <p>Relevant data addresses the question that is being investigated.</p> <p>Some observations and data are not relevant to the question being investigated.</p> <p>All relevant data must be considered.</p> <p>Evidence is produced through the study and interpretation of data.</p> <p>Data can be represented as evidence in multiple ways, including</p> <ul style="list-style-type: none"> • written texts • verbal presentations • oral traditions • graphs • tables • charts • diagrams • simulations • models <p>[continued...]</p>	<p>Ongoing collection of evidence provides a way to expand and adjust previous knowledge.</p>	<p>Decide whether to collect descriptive or measured data during an investigation.</p> <p>Interpret data collected from investigations.</p> <p>[continued...]</p>	<p>  7 Year Cycle (connection to observing population data)</p>	<p> There are many websites comparing western sciences to Indigenous sciences, such as Combining Two Ways of Knowing: Using Indigenous Knowledge to Enhance High School Science Courses</p>

 Knowledge	Understanding	Skills & Procedures	ᑭᐱᑦᑎᑦᑎᑦᑎᑦ Ways of Knowing	Other Suggestions
<p>[continued...]</p> <p>Système international d'unités (international system of units) is a common system of measurement used to communicate data and evidence.</p> <p>Système international d'unités can be abbreviated as SI.</p>		<p>[continued...]</p> <p>Interpret data and evidence expressed in SI units.</p> <p>Represent evidence from an investigation in a variety of ways.</p>		
LEARNING OUTCOME 4SM 1.2 Students investigate evidence and reflect on its role in science.				
<p>Reliability refers to consistency of data and evidence.</p> <p>Reliability of evidence can be affected by the amount of data collected and whether the data can be reproduced.</p> <p>Validity refers to how accurately data and evidence reflect what is supposed to be described or measured.</p> <p>Data can be measured more accurately using tools or technology.</p>	<p>Conclusions drawn during investigation must be based on reliable and valid evidence.</p>	<p>Collect reliable data during investigations.</p> <p>Draw conclusions using reliable and valid evidence from investigations.</p> <p>Collect valid data by accurately using tools or technology during investigations.</p> <p>Discuss tools or technology used to improve accuracy during investigations.</p> <p>Collaborate to evaluate the reliability and validity of a collection of data.</p>		