DRAFT Kindergarten to Grade 4 Science

	Kindergarten	Grade 1	Grade 2		Grade 3	Grade 4
Essential Understanding	**Investigating biodiversity and change within living systems deepens our appreciation of all forms of life.**					
Guiding Questions	**What can be observed in nature?**	**What makes living things unique from non-living things?**	**How are the diverse structures of living things similar and different?**		**How do specialized structures help plants and animals function in their environment?**	**How are living things today similar to and different from those of the past?**
Learning Outcomes	**Children observe plants and animals in nature.**	**Students distinguish between living and non-living things.**	**Students analyze life cycles of different plants and animals.**	**Students distinguish plants and animals based on observed characteristics and explore methods of classifying them.**	**Students explain how specialized structures contribute to the survival of plants and animals.**	**Students explore and analyze evidence of change in plants and animals over many generations.**
Conceptual Knowledge	• plants and animals are a part of nature • information can be collected through the senses and by learning from one another	• the environment consists of both living and non-living things • plants and animals are living things • living things grow, produce waste, and have basic needs • living things interact with their environment • rocks, soils, and objects are non-living things	• life cycles of living things represent patterns of growth and change • different kinds of plants and animals have unique life cycles • some plants and animals change in structure at different points in their life • the life cycles of different plants and animals can have some similarities	• scientists use classification as a way of grouping things with similar characteristics • there is variety in plants, including grasses, shrubs, and trees • there is variety in animals, including mammals, birds, fish, reptiles, amphibians, and invertebrates • there is variety in the structures of plants, including roots, stems, and leaves • there is variety in the structures of animals, including body covering, appendages, teeth, and body shape	• specialized structures enable plants and animals to function in their environment • some plants and animals within a particular environment have similar structures that perform similar functions • specialized structures in plants enable a variety of functions, including food production, anchoring and support, attraction of pollinators, and seed dispersal • specialized structures in animals enable a variety of functions, including sensing, eating, locomotion, protection, and camouflage • different structures in various plants and animals can perform similar functions • similar structures in different animals can perform different functions	• some plants and animals that lived in the past are different from any that are living today • some living things from long ago have become extinct while others have changed • fossils are evidence of living things that once lived on Earth
Procedural Knowledge	• exploring nature with care • listening to First Nations, Métis, or Inuit stories about plants and animals • sharing observations of plants and animals	• observing interactions of living things with the environment • identifying ways that living things meet their basic needs • differentiating between living and non-living things	• investigating the life cycle of selected living things • observing the sequence of changes in the life cycle of selected living things	• observing living things safely and with minimal disruption to the environment • comparing characteristics of different living things, including	• recording detailed observations of plant and animal structures using digital and non-digital technologies • relating plant and animal structures to their functions • comparing specialized structures and functions in plants and animals	• examining fossil evidence of past life by direct observation or other sources of information • comparing a plant or an animal to its ancient ancestor • inferring possible explanations for extinction

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			• examining structures of plants and animals at various stages of development • recording and sharing observations of plants and animals at various stages of their life cycle • comparing life cycles of different plants and animals	plant-to-plant, animal-to-animal, and plant-to-animal comparisons • choosing an observed characteristic to classify a plant or an animal • explaining classification methods • exploring First Nations, Métis, or Inuit methods of classifying plants or animals		
Competencies	• Managing Information	• Critical Thinking	• Managing Information • Critical Thinking	• Managing Information • Critical Thinking	• Critical Thinking • Communication	• Critical Thinking • Managing Information
Literacy	• LKU4a.1: Clarity • LKU3d.1: Comprehension Strategies	• LKU3d.1: Comprehension Strategies • LKU3b.1: Vocabulary	• LKU3d.1: Comprehension Strategies • LKU3b.1: Vocabulary	• LKUd.1: Comprehension Strategies • LKU3b.1: Vocabulary • LKU3c.1: Text Organization	• LKU4a.1: Clarity • LKU3d.1: Comprehension Strategies • LKU4d.1: Modes and Media • LKU3b.1: Vocabulary	• LKU3d.2: Comprehension Strategies
Numeracy	None identified	• NKU1e.1: Organization of Data	• NKU2a.1: Spatial Visualization • NKU1d.1: Patterns and Relations • NKU3b.1: Interpretation and Representation of Spatial Information	• NKU1e.1: Organizing Data	• NKU2a.1: Spatial Visualization • NKU3b.2: Interpretation and Representation of Spatial Information	• NKU2f.2: Time • NKU1d.2: Patterns and Relations • NKU3b.2: Interpretation and Representation of Spatial Information

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Essential Understanding	**Investigating the changing Earth and its connections to the universe develops our understandings of Earth's ability to support and sustain life.**				
Guiding Questions	**How can engaging in exploration help us learn about the world around us?**	**How do observed changes in daily weather affect our lives?**	**How does variety in Earth's surface influence activities we do?**	**How do the sources and flow of water demonstrate the diversity of Earth's surface?**	**How is the diversity of Earth's solid surface significant to our lives?**
Learning Outcomes	**Children develop exploration skills by asking questions and observing the land and weather.**	**Students describe daily weather and the changing seasons and predict effects on activities.**	**Students examine features of the nearby land and relate them to activities in their lives.**	**Students compare water sources on Earth's surface and analyze how it flows.**	**Students compare rocks and soils based on observed characteristics and describe ways that they can be used.**
Conceptual Knowledge	• exploring the environment involves noticing, wondering, and observing • questions are asked to learn about the environment • digital and non-digital tools can help make observations	• weather, including temperature, wind, precipitation, and cloud cover, can change over the course of a day • observable seasons can be described in terms of their characteristics • weather influences our activities	• a variety of landforms and bodies of water make up the world • observations of landforms and bodies of water help to describe them accurately • representations are used to illustrate features of the land • people interact with the land to engage in a variety of activities	• water covers most of Earth's surface, making it a unique planet • most of the water on Earth is salt water that is not drinkable by many animals • fresh water can be found in different places, including groundwater, glaciers, and precipitation • features of the land influence the flow and collection of water • water collects or flows in glaciers, streams, rivers, groundwater, local bodies of water, and oceans	• Earth's surface is made up of a variety of rocks and soils • rocks have observable characteristics, including colour, texture, lustre, presence of crystals, and relative hardness • the composition of soils (rock particles and organic matter) varies depending on their location • characteristics of rocks and soils inform how they can be used • First Nations, Métis, and Inuit traditional knowledge informs ways that rocks and soils can be used, including as significance markers, tools, shelter construction, and heat transfer
Procedural Knowledge	• exploring the environment with care • asking questions to find out about the environment • describing and representing observations of the land and weather in the local environment • practising safe and appropriate use of digital and simple tools, including magnifying glasses	• observing and recording daily weather using the senses and digital and non-digital tools • identifying characteristics of each of the seasons • representing observations of the seasons • reflecting on decisions made relating to changes in weather or seasons • relating First Nations, Métis, or Inuit stories to descriptions of weather and the seasons • practising safe and appropriate use of digital and simple tools	• observing different landforms and bodies of water using direct observation and other sources of information • describing features of the land • creating representations of landforms and bodies of water • relating features of the land to lived experiences • practising safe and appropriate use of digital and simple tools	• identifying local water sources • observing and describing features of a water source using direct observation or other sources of information • recording observations using digital or non-digital technologies • modelling the flow of water on Earth's surface • practising safe and appropriate use of digital and simple tools	• sorting rock samples based on characteristics • examining compositions of soils from different locations • investigating soils in terms of effectiveness in supporting life • acquiring pertinent information about First Nations, Métis, and Inuit selection of rocks and soils for specific purposes • practising safe and appropriate use of digital and simple tools
Competencies	• Managing Information • Communication	• Communication • Critical Thinking	• Managing Information • Critical Thinking	• Managing Information • Critical Thinking	• Managing Information • Critical Thinking
Literacy	• LKU2a.K: Develop Questions • LKU4a.K: Clarity	• LKU4a.1: Clarity • LKU2d.1: Comprehension Strategies	• LKU4a.1: Clarity • LKU3a.1: Background Knowledge • LKU4d.1: Modes and Media • LKU3d.1: Comprehension Strategies	• LKU4a.1: Clarity • LKU4d.1: Modes and Media	• LKU4a.2: Clarity • LKU2b.2: Access • LKU2c.2: Evaluate

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Numeracy	• NKU1f.K: Collecting Data • NKU3b.K: Interpretation and Representation of Spatial Information • NKU4c.K: Methods or Tools	• NKU1d.1: Patterns and Relations • NKU1f.2: Collect Data • NKU4c1: Methods or Tools • NKU3c.1: Communication	• NKU3b.1: Interpretation and Representation of Spatial Information • NKU2b.2: Management of Space • LKU2g.1: Location and Direction • NKU4c1: Methods or Tools • NKU3c.1: Communication	• NKU3b.1: Interpretation and Representation of Spatial Information • LKU2b.1: Management of Space • LKU2g.1: Location and Direction	• NKU1e.2: Organize Data • NKU1f.2: Collect Data • NKU1g.2: Interpret Data • NKU4c2: Methods or Tools

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Essential Understanding	**Investigating the interactions of the physical world facilitates understandings that can be a basis for discovery and innovation.**				
Guiding Questions	**How can different objects in our everyday lives be described and organized?**	**How can characteristics of materials help us determine ways that they can be used?**	**How can we use forces to influence the position and motion of an object?**	**How can we compare materials that exist in solid and liquid form?**	**How do forces relate to structural stability?**
Learning Outcomes	**Children examine objects and sort them according to a shared characteristic.**	**Students compare characteristics of different kinds of materials and relate them to their potential uses.**	**Students relate how a force (push or pull) can affect the motion of objects.**	**Students analyze and compare simple observable properties of liquids and solids.**	**Students relate the stability of a structure to forces acting on it.**
Conceptual Knowledge	• characteristics of objects help us identify them • characteristics of objects help us sort them • sorted objects are easier to compare	• materials have different purposes based on their characteristics • different kinds of materials, including paper, wood, plastic, metal, and glass, can be identified by their observed characteristics • characteristics of materials help to determine how they can be used • some methods for joining materials may be better than others when building an object for a specific purpose	• forces can change the motion of objects • stronger forces have a greater effect on the motion of objects than weaker forces • a push or pull can move an object upward, downward, backward, or forward • the position, direction, orientation, and motion of objects can be described relative to the observer and to other objects • the position of an object can be described using the terms above, below, behind, in front, beside, and between • the orientation of an object can be described using the terms upright and upside down • the motion of an object can be described using the terms turning, rotating, bouncing, rolling, sliding, and dragging	• materials can exist as solids and/or liquids • solids and liquids have different characteristics with respect to shape and flow • mass can be measured in grams (g) • volume can be measured in millilitres (mL) • scientists use tools to accurately measure mass and volume • different materials of the same size or volume can have different masses • different liquids can flow at different speeds • the mass of a material is not affected by a change in its shape	• structures are constructed to withstand forces, including wind, load, and vibration • forces are acting on a structure even if it is not moving • structures can fail when forces are strong enough • many factors influence structural stability, including structural forms, materials, and joining methods • First Nations, Métis, and Inuit build structures to withstand strong forces • some materials and construction activities present safety risks
Procedural Knowledge	• manipulating objects to collect sensory information • comparing characteristics of objects • describing characteristics of objects • choosing a characteristic to sort objects • justifying selection of characteristics used to sort objects	• describing characteristics of different kinds of materials • differentiating between an object and the materials from which it is made • sorting materials according to a common characteristic • determining uses for various materials • constructing an object using different materials • choosing appropriate materials based on their characteristics • exploring different methods for joining materials • constructing using tools and materials safely	• demonstrating the position, direction, orientation, and motion of objects • exploring the results of different forces on the motion of an object • predicting how the application of a given force can move an object • describing the position, direction, orientation, and motion of objects relative to the observer and other objects • describing the resulting motion of an object, using the terms faster and slower, when forces of different strengths are applied • describing, using non-standard measurements, the resulting distance travelled by an object when forces of different strengths are applied	• measuring and recording properties, including volume and mass, of different liquids and solids using digital and non-digital technologies • comparing the time that it takes for different liquids to flow • comparing the mass of different solids of the same size • comparing the mass of different liquids of the same volume	• finding information about structural stability of a form through direct observation and other sources of information • testing the structural stability of forms made of the same material • testing the structural stability of materials with the same form • testing the structural stability of joining methods • constructing using tools and materials safely • relating forces to their effects on structures • refining design to improve a structure's ability to withstand forces
Competencies	• Critical Thinking • Managing Information	• Critical Thinking • Managing Information	• Managing Information • Critical Thinking	• Critical Thinking • Managing Information	• Critical Thinking • Managing Information
Literacy	• LKU3d.K: Comprehension Strategies • LKU4c.K: Intent	• LKU3d.1: Comprehension Strategies • LKU3b.1: Vocabulary	• LKU3b.1: Vocabulary • LKU3d.1: Comprehension Strategies	• LKU2b.1: Access • LKU3b.1: Vocabulary	• NKU2b.2: Access

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Numeracy	• NKU1e.K: Organize Data • NKU2a.K: Spatial Visualization	• NKU1e.1: Organize Data • NKU4c.1: Methods or Tools • NKU3c.1: Communication • NKU1g.1: Interpret Data	• NKU2a.1: Spatial Visualization • NKU2b.1: Management of Space • NKU3c.1: Communication • NKU1h.1: Probability • NKU1g.1: Interpret Data • NKU4b.1: Estimation	• NKU1e.1: Organize Data • NKU1f.2: Collect Data • NKU2c.1: Measurement • NKUd.1: Units of Measurement • NKU4c.1: Methods or Tools	• NKU3b.2: Interpretation and Representation of Spatial Information • NKU4a.2: Strategies • NKU4c.2: Methods or Tools • NA3a.2: Task Analysis

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Essential Understanding	**Investigating the interactions of the physical world facilitates understandings that can be a basis for discovery and innovation.**				
Guiding Questions				**How can we determine the presence of energy in our everyday lives?**	**How are living things and the environment connected by energy flow?**
Learning Outcomes				**Students identify some sources of energy and explore how energy can cause motion or change.**	**Students relate interconnectedness in living things to energy flow in food chains.**
Conceptual Knowledge				• the Sun is a source of energy • energy is needed to make things move or change • energy can be stored in various ways, including in fuel, food, batteries, compressed springs, and stretched elastics • stored energy can be accessed to move or change things	• all living things need energy to survive • the sun's energy is needed for plants to grow • a food chain is a scientific model that represents a pathway of energy among producers, consumers, and decomposers • a change in a component of a food chain can affect the entire pathway • various factors, including human activity, can affect food chains
Procedural Knowledge				• exploring examples of stored energy • relating movement and change to the presence of energy • relating stored energy to the ability to cause movement or change • causing an object to move using stored energy • reflecting on personal energy use and identifying ways to reduce it	• observing and identifying examples of the interactions of living things in the environment that demonstrate energy flow • modelling pathways of energy in food chains • justifying whether living things are producers, consumers, or decomposers based on how they acquire energy • predicting the effects of a change within a food chain • describing interconnections among living things identified by First Nations, Métis, and Inuit traditional knowledge
Competencies				• Critical Thinking	• Critical Thinking
Literacy				• LKU3d.1: Comprehension Strategies	• LKU3d.2: Comprehension Strategies
Numeracy				• NKU2b.1: Management of Space	• LKU3b.2: Interpretation and Representation of Spatial Information • NKU4b.2: Estimation

	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
Essential Understanding	**Examining the nature of science and scientific inquiry can help us appreciate the development of knowledge about the natural world.**				
Guiding Questions		**How can engaging in investigations help us explore and learn about the world around us?**	**How can engaging in investigations help us develop knowledge about the world around us?**	**How can engaging in scientific investigations help us develop knowledge about the world around us?**	**How can engaging in scientific inquiry enable us to produce evidence to support explanations of scientific phenomena?**
Learning Outcomes		**Students describe how observation and asking questions are a part of science.**	**Students perform a guided investigation to answer questions about the environment.**	**Students collect and analyze data during a scientific investigation.**	**Students perform a controlled experiment to learn more about a scientific phenomenon.**
Conceptual Knowledge		• curiosity leads to questioning, observing, and exploring • science involves asking questions about the world around us • senses function to help gather information from the environment • asking questions helps people learn from one another • digital and non-digital tools enhance the ability to observe and collect information	• an investigation has procedures that guide how information is gathered • observations provide the information needed to answer a question being investigated • predictions can be made from observations and personal experience • scientific processes involve recognizing patterns in observations of the world • communication of results is a part of a scientific investigation • digital and non-digital tools can be used for making direct and indirect observations	• a scientific investigation provides a systematic way to answer questions about the world around us • data, including detailed observations, accurate measurements, and careful collection of samples, are collected appropriately for scientific investigations • scientists use a variety of methods, tools, and technologies to observe, measure, and collect samples • standard measurements enable comparison of results • analysis involves examining data to infer meaning • collecting information through observation and lived experience is an important aspect of First Nations, Métis, and Inuit understandings of the world around us	• scientific inquiry involves a variety of methods, including controlled experiments and field studies • a controlled experiment tests the effect that one variable has on another by keeping all other relevant variables constant • variables are measurements or factors that can change in a controlled experiment • predictions are based on inferences • scientific phenomena are observable events that occur in the world around us • consistent results involve following a procedure carefully • evidence is data that supports an inference • observations and lived experience are an important aspect of First Nations, Métis, and Inuit understandings of the world around us
Procedural Knowledge		• identifying questions about the world around us • observing the world around us in a safe manner • practising safe and appropriate use of digital and non-digital tools • sharing observations • following simple procedures safely	• generating questions that could be investigated • predicting results of an investigation • following a procedure safely • recording observations accurately • identifying patterns in recorded observations • discussing investigation results	• performing investigations safely • collecting data using digital or non-digital technologies • measuring using tools with standard units • recording observations in diagrams and tables using digital or non-digital technologies • discussing results and simple inferences from an investigation	• relating science activities to methods of scientific inquiry • reflecting on personal interests and skills related to scientific inquiry • selecting a testable question • formulating a prediction with an explanation • performing an experiment safely • recording observations in tables, diagrams, or other representations using digital or non-digital technologies • constructing simple graphs of collected data • analyzing results and refining inferences from an investigation
Competencies		• Managing Information • Communication	• Critical Thinking • Problem Solving	• Critical Thinking • Problem Solving	• Problem Solving • Critical Thinking
Literacy		• LKU4a.1: Clarity	• LKU3d.1: Comprehension Strategies • LKU2a.1: Develop Questions	• LKU3d.1: Comprehension Strategies	• LKU4a.1: Clarity • LKU3b.2: Vocabulary • LKU3a.2: Background Knowledge • LKU3c.2: Text Organization

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					• LKU3d.2: Comprehension Strategies • LKU4d.2: Modes and Media
Numeracy		• NKU4c.1: Methods or Tools	• NKU1F.1: Collect Data • NKU1g.1: Interpret Data • NKU1e.1: Organize Data	• NKU1f.1: Collect Data • NKU2c.1: Measurement • NKU4c.1: Methods or Tools • NKU2d.1: Units of Measurement	• NKU1e.2: Organizing Data • NKU1f.2: Collecting Data • NKU1g.2: Interpret Data • NKU4c.2: Methods or Tools • NA2a.2: Personal Insight

	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
Essential Understanding	**Exploring dynamic interconnections in the world and universe strengthens our understandings of relationships.**				
Guiding Questions *STSE*	**How are we connected to nature?**	**How can our actions affect the environment?**	**How can understanding science help us protect the environment?**	**How can connections among science, technology, and the environment contribute to our conservation efforts?**	**How can connections among science, society, and the environment contribute to our stewardship efforts?**
Learning Outcomes	**Children explore nature and describe personal connections to it.**	**Students explore personal connections to nature and explain how personal actions can affect it.**	**Students explore interconnections between science and the environment.**	**Students examine ways that personal and community actions can support conservation.**	**Students investigate actions that support stewardship of the land.**
Conceptual Knowledge	• people are connected to nature through the air, food, and water • personal actions can have an effect on nature	• people are connected to nature through the air, food, and water • personal actions affect nature in different ways • nature can affect people in different ways • exploration of the local environment supports learning about the world • information can be collected by using the senses and learning from one another	• science involves learning about how personal actions can have an effect on the environment • observations can be made with minimal disruption to the environment by leaving things the way they were found • First Nations, Métis, and Inuit traditional knowledge considers all things on Earth as connected and having equal importance	• water conservation promotes continued access to water • access to fresh water is limited on Earth • water is used by living things for many purposes, including hydration, habitat, hygiene, sanitation, transport, and industry • there are various ways that water can be conserved • technology can support water conservation efforts	• stewardship of the land involves taking care of the quality of the land • soil erosion reduces the soil available for plants • there are different ways to reduce soil erosion • soils can be contaminated in a number of ways • soil contamination reduces the quality of soils for plant growth
Procedural Knowledge	• exploring nature with care • describing how personal actions can affect nature • relating First Nations, Métis, or Inuit stories to personal connection to nature • describing and representing observations of nature, including plants and animals, in the local environment	• exploring nature with care • describing how personal actions can affect nature • demonstrating personal actions that help reduce the impact on nature • relating how people are connected to nature using knowledge from First Nations, Métis, or Inuit stories	• observing the environment with minimal disruption • demonstrating actions that are intended to reduce negative effects on the environment • describing the ways that First Nations, Métis, and Inuit respect and care for plants and animals as part of community	• discussing ways that water is used and conserved within our communities • discussing factors that affect access to safe drinking water • identifying key teachings on the importance of water conservation found in First Nations, Métis, or Inuit stories • describing the role of technology in water conservation • implementing a plan that is intended to promote water conservation	• investigating ways to help prevent soil loss and maintain soil quality • discussing possible consequences of soil contamination • reflecting on First Nations, Métis, or Inuit stories or teachings that reflect stewardship of the land
Competencies	• Personal Growth and Well-being • Communication	• Personal Growth and Well-being • Communication	• Personal Growth and Well-being • Cultural and Global Citizenship	• Cultural and Global Citizenship • Critical Thinking	• Cultural and Global Citizenship • Critical Thinking
Literacy	• LKU4a.1: Clarity • LKU3d.1: Comprehension Strategies	• LKU4a.1: Clarity • LKU3d.1: Comprehension Strategies	• LKU4a.1: Clarity • LKU3d.1: Comprehension Strategies	• LKU4a.1: Clarity • LKU3d.1: Comprehension Strategies	• LKU2b.2: Access • LKU3d.2: Comprehension Strategies
Numeracy	• None identified	• None identified	• None identified	• None identified	• None identified