Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold	Season	Nehiyaw Ways of Knowing
	SCIENCE INQUIRY		
	GENERAL LEARNER EXPECTATION 4–1 **Investigate the nature of things, demonstrating purposeful action that leads to inferences supported by observations.**		
	GENERAL LEARNER EXPECTATION 4–2 **Identify patterns and order in objects and events studied; and record observations, using pictures, words and charts, with guidance in the construction of charts; and make predictions and generalizations, based on observations.**		
Focus	• **ask questions that lead to exploration and investigation**		
	• identify one or more possible answers to questions by stating a prediction or a hypothesis		
Explore and Investigate	• identify, with guidance, ways of finding answers to given questions		
	• carry out, with guidance, procedures that comprise a fair test		
	• identify materials and how they are used		
	• work independently or with others to carry out the identified procedures		
	• identify, with guidance, sources of information and ideas and access information and ideas from those sources. Sources may include library, classroom, community and computer-based resources		
Reflect and Interpret	• communicate with group members, showing ability to contribute and receive ideas		
	• record observations and measurements accurately, using captioned pictures and charts, with guidance in the construction of charts. Computer resources may be used for record keeping and for display and interpretation of data		
	• state an inference, based on observations		
	• identify possible applications of what was learned		
	• identify new questions that arise from what was learned.		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold	Season	Nehiyaw Ways of Knowing
	PROBLEM SOLVING THROUGH TECHNOLOGY		
	GENERAL LEARNER EXPECTATION 4–3 **Investigate a practical problem, and develop a possible solution.**		
Focus	• identify the purpose of problem-solving and construction activities: What problem do we need to solve? What needs must be met?		
Explore and Investigate	• identify steps followed in completing the task and in testing the product		
	• identify materials and how they are used		
	• attempt a variety of strategies and modify procedures, as needed (troubleshoot problems)		
	• engage in all parts of the task and support the efforts of others		
	• identify, with guidance, sources of information and ideas and access information and ideas from those sources. Sources may include library, classroom, community and computer-based resources		
Reflect and Interpret	• communicate with group members, showing ability to contribute and receive ideas		
	• evaluate a product, based on a given set of questions or criteria. The criteria/questions may be provided by the teacher or developed by the students. Example criteria include: – effectiveness —Does it work? – reliability—Does it work every time? – durability—Does it stand up to repeated use? – effort—Is it easy to construct? Is it easy to use? – safety—Are there any risks of hurting oneself in making it or using it? – use of materials—Can it be made cheaply with available materials? Does it use recycled materials, and can the materials be used again?		
	• identify possible improvements to the product		
	• identify new applications for the design or method of construction.		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold	Season	Nehiyaw Ways of Knowing
	ATTITUDES		
	GENERAL LEARNER EXPECTATION 4–4 **Demonstrate positive attitudes for the study of science and for the application of science in responsible ways.**		
	Students will show growth in acquiring and applying the following traits: • curiosity • confidence in personal ability to explore materials and learn by direct study • inventiveness • perseverance: staying with an investigation over a sustained period of time • appreciation of the value of experience and careful observation • a willingness to work with others and to consider their ideas • a sense of responsibility for actions taken • respect for living things and environments, and commitment for their care		
	TOPIC A: WASTE AND OUR WORLD (MAY-JUNE)		
GENERAL LEARNER EXPECTATION 4–5 **Recognize that human activity can lead to the production of wastes, and identify alternatives for the responsible use and disposal of materials.**			• **Activities around the practice of good stewardships(environmental/ recycling/conservation/waste management) (Peerless Lake Elders' Wheel)**
	1. Identify plant and animal wastes, and describe how they are recycled in nature. For example, plant leaves serve as a source of food for soil insects, worms and other creatures. The wastes of these animals may then be further broken down by molds, fungi and bacteria.		• **Activities around the practice of good stewardships(environmental/ recycling/conservation/waste management) (Peerless Lake Elders' Wheel)**
	2. Identify and classify wastes that result from human activity.		
	3. Describe alternative methods of disposal, and identify possible advantages and disadvantages of each.		
	4. Distinguish between wastes that are readily biodegradable and those that are not.		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold	Season	Nehiyaw Ways of Knowing
	5. Compare different kinds of packaging, and infer the relative advantages and disadvantages of that packaging. In evaluating different forms of packaging, students should demonstrate the ability to consider a consumer perspective as well as an environmental perspective		
	6. Identify methods of waste disposal currently used within the local community.		
	7. Identify kinds of wastes that may be toxic to people and to the environment.		
	8. Identify alternative materials and processes that may decrease the amount of waste produced; e.g., reducing wastage of food, using both sides of a sheet of paper.		
	9. Identify ways in which materials can be reused or recycled, including examples of things that the student has done.		• **Use boxes for art/making cars/ crafts. Classroom waste and bottles collected for recycling) Composting etc.**
	10. Develop a flow chart for a consumer product that indicates the source materials, final product, its use and method of disposal.		
	11. Identify actions that individuals and groups can take to minimize the production of wastes, to recycle or reuse wastes and to ensure the safe handling and disposal of wastes.		
	12. Develop and implement a plan to reduce waste, and monitor what happens over a period of time.		• **Place recycle bins in classrooms and have classroom rules on the disposal of waste. Teach that there is savings from recycling. Students take leadership role in these activities. Reference the dangers to the environment and the positives of the reuse/recycle initiatives.**

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold	Season	Nehiyaw Ways of Knowing
	TOPIC B: WHEELS AND LEVERS (SPRING: MARCH-MAY)		
GENERAL LEARNER EXPECTATION 4-6 **Demonstrate a practical understanding of wheels, gears and levers by constructing devices in which energy is transferred to produce motion.**			• **Wagon and hoist for lifting animals when lifting them. Pulley systems**
	1. Explain how rollers can be used to move an object, and demonstrate the use of rollers in a practical situation.		
	2. Compare the wheel and the roller, and identify examples where each are used.		
	3. Construct devices that use wheels and axles, and demonstrate and describe their use in: • **model vehicles** • **pulley systems** • **gear systems.**		• **Wagon and hoist for lifting animals when lifting them. Pulley systems (Knowledge Keepers information on sewing machines etc.)**
	4. Construct and explain the operation of a drive system that uses one or more of the following: • **wheel-to-wheel contact** • **a belt or elastic** • **a chain** • **cogs or gears.**		• **Wagon and hoist for lifting animals when lifting them. Pulley systems (Knowledge Keepers information on sewing machines etc.)/Snow mobiles**
	5. Construct and explain the operation of a drive system that transfers motion from one shaft to a second shaft, where the second shaft is: • parallel to the first • at a 90° angle to the first. *Students who have achieved this expectation will be aware of changes in speed and direction that result from different ways of linking components.* *Introduction of gear ratios, however, is not recommended at this grade level.* *Students will have an opportunity to develop the concept of ratio as part of their junior high mathematics program.*		
	6. Demonstrate ways to use a lever that: • applies a small force to create a large force • applies a small movement to create a large movement.		
	7. Predict how changes in the size of a lever or the position of the fulcrum will affect the forces and movements involved.		

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold	Season	Nehiyaw Ways of Knowing
	8. Construct models of levers; and explain how levers are involved in such devices as: teetertotters, scissors, pliers, pry bars, tongs, nutcrackers, fishing rods, wheelbarrows.		• **Construct Wagons, make fishing rods, wheelbarrows, pliers and making Muskrat/Beaver traps. Pulley systems (Knowledge Keepers information on sewing machines etc.) Doing Robotic constructions**
	TOPIC C: BUILDING DEVICES AND VEHICLES THAT MOVE (FALL-OCTOBER)		
	GENERAL LEARNER EXPECTATION 4-7 **Construct a mechanical device for a designated purpose, using materials and design suggestions provided.** **GENERAL LEARNER EXPECTATION 4-8** **Explore and evaluate variations to the design of a mechanical device, demonstrating that control is an important element in the design and construction of that device.**		• **Constructing miniature horse drawn wagon/Red River Carts** • **Constructing miniature horse drawn wagon/Red River Carts/ sledge (demonstrating use)**
	1. Design and construct devices and vehicles that move or have moving parts—linkages, wheels and axles.		• **Constructing miniature horse drawn wagon/Red River Carts/ Sledge**
	2. Use simple forces to power or propel a device; e.g., direct pushes, pulls, cranking mechanisms, moving air, moving water and downhill motion.		
	3. Design and construct devices and vehicles that employ energy-storing or energy-consuming components that will cause motion; e.g., elastic bands, springs, gravity, wind, moving water.		• **Constructing miniature canoes/ motor boats/sling shots/bow & arrow/archery**
	4. Recognize the need for control in mechanical devices, and apply control mechanisms where necessary.		
	5. Compare two designs, identifying the relative strengths and weaknesses of each.		
	6. Identify steps to be used in constructing a device or vehicle, and work cooperatively with other students to construct the device or vehicle.		
	7. Design and construct several different models of a device and evaluate each model, working cooperatively with other students. *Suggested evaluation criteria are identified under the Specific Learner Expectations, Reflect and Interpret, page B.18.*		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold	Season	Nehiyaw Ways of Knowing
	TOPIC D: LIGHT AND SHADOWS (SEPTEMBER/OCTOBER/JANUARY-MID-MARCH)		
GENERAL LEARNER EXPECTATION 4–9 **Identify sources of light, describe the interaction of light with different materials, and infer the pathway of a light beam.**			• **Sun/Moon/Fire/Stars/Light bulbs/ Lanterns/Fire flies/Northern Lights**
	1. Recognize that eyes can be damaged by bright lights and that one should not look at the Sun—either directly or with binoculars or telescopes.		
	2. Identify a wide range of sources of light, including the Sun, various forms of electric lights, flames, and materials that glow (luminescent materials).		• **Sun/Moon/Fire/Stars/Light bulbs/ Lanterns/Fire flies/Northern Lights**
	3. Distinguish objects that emit their own light from those that require an external source of light in order to be seen.		
	4. Demonstrate that light travels outward from a source and continues unless blocked by an opaque material.		
	5. Describe changes in the size and location of Sun shadows during the day—early morning, to midday, to late afternoon.		• **Tracking Sun from season to season as well as throughout each day**
	6. Recognize that opaque materials cast shadows, and predict changes in the size and location of shadows resulting from the movement of a light source or from the movement of a shade-casting object.		
	7. Distinguish transparent materials from opaque materials by determining if light passes through them and by examining their shadows.		• **Demonstration of various objects to show those that are transparent/opaque and relate them to traditional stories about the sun.**
	8. Classify materials as transparent, partly transparent (translucent) or opaque.		• **Demonstration of various objects to show those that are transparent/opaque and relate them to traditional stories about the sun.**

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold	Season	Nehiyaw Ways of Knowing
	9. Recognize that light can be reflected and that shiny surfaces, such as polished metals and mirrors, are good reflectors.		• **Demonstrations that show how these objects reflect and how mirrors can be used to start fires. Fire/Ice demonstrations.**
	10. Recognize that light can be bent (refracted) and that such objects as aquaria, prisms and lenses can be used to show that light beams can be bent.		
	11. Recognize that light can be broken into colours and that different colours of light can be combined to form a new colour.		
	12. Demonstrate the ability to use a variety of optical devices, describe how they are used, and describe their general structure. Suggested examples include: hand lens, telescope, microscope, pinhole camera, light sensitive paper, camera, kaleidoscope. Students meeting this expectation will be able to provide practical descriptions of the operation of such devices, but are not required to provide theoretical explanations of how the devices work.		• **Classrooms activities infusing traditional thoughts and ideas around these instruments. Landbase connections e.g. hunting should be explored.**
TOPIC E: PLANT GROWTH AND CHANGES (FALL SEPTEMBER-OCTOBER, WINTER/SPRING: MARCH-MAY)			
GENERAL LEARNER EXPECTATION 4-10 Demonstrate knowledge and skills for the study, interpretation, propagation and enhancement of plant growth.			
	1. Describe the importance of plants to humans and their importance to the natural environment. Students who meet this expectation should be able to give examples of plants being used as a source of food or shelter, and be aware of the role plants play in the environment; e.g., preventing erosion, maintaining oxygen.		• **Connect to herbal LBL, plants as medicine and for food (survival skills)**
	2. Identify and describe the general purpose of plant roots, stems, leaves and flowers.		
	3. Describe common plants, and classify them on the basis of their characteristics and uses.		• **LBL camps - bush walk; plants, trees and herbs. Identify if the plant is a source of food, shelter or medicine**
	4. Recognize that plant requirements for growth; i.e., air, light energy, water, nutrients and space; vary from plant to plant and that other conditions; e.g., temperature and humidity; may also be important to the growth of particular plants.		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold	Season	Nehiyaw Ways of Knowing
	5. Identify examples of plants that have special needs.		
	6. Recognize that a variety of plant communities can be found within the local area and that differences in plant communities are related to variations in the amount of light, water and other conditions.		• **Connect to animal habitats as animals prefer specific plant communities; Go on a community walk to identify plants. Plant a community garden**
	7. Recognize that plants of the same kind have a common life cycle and produce new plants that are similar, but not identical, to the parent		
	8. Describe ways that various flowering plants can be propagated, including from seed, from cuttings, from bulbs and by runners.		
	9. Nurture a plant through one complete life cycle—from seed to seed.		
	10. Describe the care and growth of a plant that students have nurtured, in particular: **• identify the light, temperature, water and growing medium requirements of the plant** **• identify the life stages of the plant** **• identify the reproductive structures of the plant.**		• **Plant a school garden; hydroponic gardens**
	11. Describe different ways that seeds are distributed; e.g., by wind, by animals; and recognize seed adaptations for different methods of distribution.		