





 Big Idea, Major Concepts, GLOs	Specific Learning Outcomes <small>ELOs are bold</small>	Season	Nehiyaw Ways of Knowing
SCIENCE INQUIRY			
 GENERAL LEARNER EXPECTATION 5-1 Design and carry out an investigation, using procedures that provide a fair test of the question being investigated.			
 GENERAL LEARNER EXPECTATION 5-2 Recognize the importance of accuracy in observation and measurement; and, with guidance, apply suitable methods to record, compile, interpret and evaluate observations and measurements.			
Focus	<ul style="list-style-type: none"> ask questions that lead to exploration and investigation 		
	<ul style="list-style-type: none"> identify one or more possible answers to questions by stating a prediction or a hypothesis 		
Explore and Investigate	<ul style="list-style-type: none"> identify one or more ways of finding answers to given questions 		
	<ul style="list-style-type: none"> plan, with guidance, and carry out procedures that comprise a fair test 		
	<ul style="list-style-type: none"> identify variables that need to be held constant to ensure a fair test 		
	<ul style="list-style-type: none"> select appropriate materials and identify how they will be used 		
	<ul style="list-style-type: none"> work individually or cooperatively in planning and carrying out procedures 		
	<ul style="list-style-type: none"> identify 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	<ul style="list-style-type: none"> communicate with group members to share and evaluate ideas, and assess progress 		
	<ul style="list-style-type: none"> record observations and measurements accurately, using a chart format where appropriate. Computer resources may be used for record keeping and for display and interpretation of data 		
	<ul style="list-style-type: none"> state an inference, based on results. The inference will identify a cause and effect relationship that is supported by observations 		
	<ul style="list-style-type: none"> evaluate how well the procedures worked and identify possible improvements 		
	<ul style="list-style-type: none"> identify possible applications of what was learned 		
	<ul style="list-style-type: none"> identify new questions that arise from what was learned. 		


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PROBLEM SOLVING THROUGH TECHNOLOGY

GENERAL LEARNER EXPECTATION 5–3
Design and carry out an investigation of a practical problem, and develop a possible solution.

		Season	Nehiyaw Ways of Knowing
Focus	<ul style="list-style-type: none"> identify problems to be solved and the purpose(s) of the problem-solving activity: What problem(s) are we trying to solve? What conditions must be met? What controls are required? How will we know that we have done what we set out to do? 		
Explore and Investigate	<ul style="list-style-type: none"> identify one or more possible approaches to solving the problem and plan, with guidance, a set of steps to follow 		
	<ul style="list-style-type: none"> select appropriate materials and identify how they will be used 		
	<ul style="list-style-type: none"> attempt a variety of strategies and modify procedures, as needed (troubleshoot problems) 		
	<ul style="list-style-type: none"> work individually or cooperatively in planning and carrying out procedures 		
Reflect and Interpret	<ul style="list-style-type: none"> identify sources of information and ideas and access information and ideas from those sources. Sources may include library, classroom, community and computer-based resources 		
	<ul style="list-style-type: none"> communicate with group members to share and evaluate ideas, and assess progress 		
	<ul style="list-style-type: none"> evaluate the procedures used to solve the problem and identify possible improvements 		
	<ul style="list-style-type: none"> evaluate a design or 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: <ul style="list-style-type: none"> – 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? – effect on environments – benefit to society 		

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Reflect and Interpret	<ul style="list-style-type: none"> identify new applications for the design or problem solution. 		
ATTITUDES			
 GENERAL LEARNER EXPECTATION 5-4 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: <ul style="list-style-type: none"> 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: ELECTRICITY AND MAGNETISM (DECEMBER-JANUARY)			
GENERAL LEARNER EXPECTATION 5-5 Demonstrate safe methods for the study of magnetism and electricity, identify methods for measurement and control, and apply techniques for evaluating magnetic and electrical properties of materials.		<ul style="list-style-type: none"> Use the science kits for magnetism & Electricity for demonstration. Doing various experiments with magnets and electricity. Reinforce that magnetics are in many household appliances and safe use of electricity. Lightening is a source of electricity and links to the Northern lights being the reflection of magnetism in the earth's surface (tell Nehiyawin stories of the Northern Lights). 	



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1. **Recognize and appreciate the potential dangers involved in using sources of electrical currents:**

- understand that household electrical currents are potentially dangerous and not a suitable source for experimentation
- understand that small batteries are a relatively safe source of electricity, for experimentation and study, but that care should be taken to avoid short circuits
- understand that short circuits may cause wires to heat up, as well as waste the limited amount of energy in batteries.



- **Activities around the safe use of electrical appliances/robotics activities. Safety activities around electrical outlets in the household. Electrical overloads due to the amount of electrical Watts in households.**

2. Describe and demonstrate example activities that show that electricity and magnetism are related:

- demonstrate that electricity can be used to create magnetism
- demonstrate that a moving magnet can be used to generate electricity.

3. Demonstrate and interpret evidence of magnetic fields around magnets and around current-carrying wires, by use of iron filings or by use of one or more compasses.

4. Demonstrate that a continuous loop of conducting material is needed for an uninterrupted flow of current in a circuit.

5. Distinguish electrical conductors
—materials that allow electricity to flow through them
— from insulators
—materials that do not allow electricity to flow through them.

6. Recognize and demonstrate that some materials, including resistors, are partial conductors of electricity.

7. Predict the effect of placing an electrical resistance in a simple circuit; e.g., in a circuit with a light bulb or electric motor.

8. **Recognize that the amount of electricity we use in our homes is measured in kilowatt hours.**







- **Safety activities around electrical outlets in the household. Electrical overloads due to the amount of electrical Watts in households.**

9. Interpret and explain:

- the reading on a household electrical meter
- efficiency labels on electrical appliances.

10. Draw and interpret, with guidance, circuit diagrams that include symbols for switches, power sources, resistors, lights and motors.

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TOPIC B: MECHANISMS USING ELECTRICITY (NOVEMBER)			
GENERAL LEARNER EXPECTATION 5-6 Construct simple circuits, and apply an understanding of circuits to the construction and control of motorized devices.			<ul style="list-style-type: none"> • Robotics construction sets from games with electrical circuits (motor bikes/small cars).
1. Identify example applications of electrical devices in the school and home environment, and classify the kinds of uses. Categories of electrical use may include such things as: heating, lighting, communicating, moving, computing.			
2. Design and construct circuits that operate lights and other electrical devices.			<ul style="list-style-type: none"> • Creating activity using the light bulbs (plugged in electrical outlets) classroom electrical appliances e.g., toasters
3. Recognize the importance of switches and other control mechanisms to the design and operation of electrical devices, and identify purposes of switches in particular applications.			
4. Construct and use a variety of switches.			
5. Design and construct vehicles or other devices that use a battery-powered electric motor to produce motion; e.g., model cars, hoists, fans.			
6. Design and construct a burglar alarm.			
7. Demonstrate different ways of lighting two lights from a single power source, and compare the results. Students should recognize that wiring two bulbs in series makes both bulbs glow less brightly than if the bulbs are wired in parallel. Students may demonstrate this knowledge operationally and do not need to use the terms series and parallel.			
8. Demonstrate different ways of using two batteries to light a bulb, and compare the results. Students should recognize that wiring the batteries in series causes the bulb to glow brighter than it would if parallel wiring were used.			
9. Given a design task and appropriate materials, invent and construct an electrical device that meets the task requirements.			<ul style="list-style-type: none"> • Using different play toolkits for classroom activities/robotics


TOPIC C: CLASSROOM CHEMISTRY (SEPTEMBER-OCTOBER)
GENERAL LEARNER EXPECTATION 5-7

Describe the properties and interactions of various household liquids and solids, and interpret their interactions.



- Use bleach/baking soda/salt/ice activities to show the change from one state to the next.

1. Recognize and identify examples of the following kinds of mixtures:

- two or more solids; e.g., sand and sugar
- a solid and a liquid; e.g., sugar and water
- two or more liquids; e.g., milk and tea.



- Use bleach/baking soda/salt/ice/water/milk/sugar activities to show the change from one state to the next. Include the use medicinal plant and teas for cultural connections.

2. Apply and evaluate a variety of techniques for separating different materials.

3. Distinguish substances that will dissolve in a liquid from those that will not, and demonstrate a way of recovering a material from solution.

4. Demonstrate a procedure for making a crystal.

5. Recognize that the surface of water has distinctive properties, and describe the interaction of water with other liquids and solids.


- Use oil/water activities to show the negative interaction to living things in natural bodies of water lakes/streams/rivers. Composition of bodies of water and lakes.




6. Produce carbon dioxide gas through the interaction of solids and liquids, and demonstrate that it is different from air.

7. Distinguish reversible from irreversible changes of materials, and give examples of each.

8. Recognize and describe evidence of a chemical reaction. Explain how the products of a reaction differ from the original substances.


- Activities that surround the making/cooking of cultural foods (e.g., bannock) traditional medicines, tanning hides, preparing foods (moose, muskrat, rabbit, etc.) Preserving and canning foods.

9. Use an indicator to identify a solution as being acidic or basic.

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TOPIC D: WEATHER WATCH (THROUGHOUT THE YEAR)			
	<p style="text-align: center;">GENERAL LEARNER EXPECTATION 5–8</p> <p style="text-align: center;">Observe, describe and interpret weather phenomena; and relate weather to the heating and cooling of Earth’s surface.</p>		<ul style="list-style-type: none"> Follow the Cree Lunar calendar; read about the Cree moons related to the month - make predictions and assumptions about what they would see; how different types of shelters connect to weather phenomena; watch animal behaviors to predict the weather
	<p style="text-align: center;">GENERAL LEARNER EXPECTATION 5–9</p> <p style="text-align: center;">Observe, describe and interpret weather phenomena; and relate weather to the heating and cooling of Earth’s surface. 5–9 Investigate relationships between weather phenomena and human activity.</p>		<ul style="list-style-type: none"> Look at the type of clothing related to weather; global warming issues; traditional clothing; connect to the foods we eat
	<p>1. Predict where, within a given indoor or outdoor environment, one is likely to find the warmest and coolest temperatures.</p>		
	<p>2. Describe patterns of air movement, in indoor and outdoor environments, that result when one area is warm and another area is cool.</p>		
	<p>3. Describe and demonstrate methods for measuring wind speed and for finding wind direction.</p>		
	<p>4. Describe evidence that air contains moisture and that dew and other forms of precipitation come from moisture in the air.</p>		
	<p>5. Describe and measure different forms of precipitation, in particular, rain, hail, sleet, snow.</p>		<ul style="list-style-type: none"> Learn about different types of clouds; learn the Cree words to describe the types of precipitation (e.g., different words for snow)
	<p>6. Measure at least four different kinds of weather phenomena. Either student constructed or standard instruments may be used.</p>		<ul style="list-style-type: none"> Design and create and test student made instruments for measuring wind speed, rainfall, humidity, etc.
	<p>7. Record weather over a period of time.</p>		



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8. Identify some common types of clouds, and relate them to weather patterns.

9. Describe the effects of the Sun's energy on daily and seasonal changes in temperature— 24-hour and yearly cycles of change.

10. Recognize that weather systems are generated because different surfaces on the face of Earth retain and release heat at different rates.

11. Understand that climate refers to long term weather trends in a particular region and that climate varies throughout the world.



- Look at the seasonal round and how that is related to climate; listening to Elders share about weather changes and the impact on the land (e.g., how the lake has changed over time and how it has affected the fish population); look at movement of animals due to climate change (not just locally but nationally)

12. Recognize that human actions can affect climate, and identify human actions that have been linked to the greenhouse effect.

- Connect to forest fires, oil spills, pollution and waste management; discuss how cattle ranching contributes to the greenhouse effect

13. Appreciate how important it is to be able to forecast weather and to have suitable clothing or shelter to endure various types of weather.

14. Test fabrics and clothing designs to choose those with characteristics that most effectively meet the challenges of particular weather conditions; e.g., water resistance, wind resistance, protection from cold.

TOPIC E: WETLAND ECOSYSTEMS (MARCH-MAY)






GENERAL LEARNER EXPECTATION 5-10

Describe the living and nonliving components of a wetland ecosystem and the interactions within and among them.



- Connect to LBL Canoe and the Trapping camp; medicinal plant gathering and in what ecosystem you would find the plant

1. Recognize and describe one or more examples of wetland ecosystems found in the local area; e.g., pond, slough, marsh, bog, fen.

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	2. Understand that a wetland ecosystem involves interactions between living and nonliving things, both in and around the water.		<ul style="list-style-type: none"> • Connect to LBL Canoe and the Trapping camp; medicinal plant gathering and in what ecosystem you would find the plant
	3. Identify some plants and animals found at a wetland site, both in and around the water; and describe the life cycles of these plants and animals.		
	4. Identify and describe adaptations that make certain plants and animals suited for life in a wetland.		<ul style="list-style-type: none"> • Connect to LBL Trapping camp; medicinal plant gathering and in what ecosystem you would find the plant; examine how animal pelts adapt throughout the seasons; tie in the oral tradition stories to learn about the adaptations of animals (e.g., the moose story or why the rabbit turns white, etc).
	5. Understand and appreciate that all animals and plants, not just the large ones, have an important role in a wetland community.		
	6. Identify the roles of different organisms in the food web of a pond: <ul style="list-style-type: none"> • producers—green plants that make their own food, using sunlight • consumers—animals that eat living plants and/or animals • decomposers—organisms, such as molds, fungi, insects and worms, that reuse and recycle materials that were formerly living. 		
	7. Draw diagrams of food chains and food webs, and interpret such diagrams.		<ul style="list-style-type: none"> • Diagrams of muskrat, or beaver, squirrel, marten, lynx, etc.
	8. Recognize that some aquatic animals use oxygen from air and others from water, and identify examples and adaptations of each.		
	9. Identify human actions that can threaten the abundance or survival of living things in wetland ecosystems; e.g., adding pollutants, changing the flow of water, trapping or hunting pond wildlife.		<ul style="list-style-type: none"> • Oil spills, pollution, hydro dams, general affect of industry, irrigation, cutting down of trees/forests
	10. Identify individual and group actions that can be taken to preserve and enhance wetland habitats.		