	All Year	Fall	Winter	Spring
English Language Arts	Connect to themes from Social Studies, Science, Math and Land Based Learning and Cree ways of knowing and being			
Social Studies		From Isolation to Adaptation: Japan	Origins of a Western Worldview: Renaissance Europe	Worldviews in Conflict: The Spanish and the Aztecs
Mathematics		Number Sense	Patterns and Relations	Shape and Space Statistics and Probability
Science		Unit A: Mix and Flow of Matter Unit B: Cells and Systems	Unit C: Light and Optical Systems Unit D: Mechanical Systems	Unit D: Mechanical Systems Unit E: Freshwater and Saltwater Systems

HOW TO READ THE CURRICULUM CHARTS

- Specific learning outcomes deemed as Essential Learning Outcomes (ELOs) are identified in **bold and highlighted** in the Nehiyaw Ways of Knowing and Land Based Learning columns
- This grade level starts with English Language Arts as these ELOs must be taught/reinforced all year; Social Studies, Math and Science charts specific to each season follow
- The colours and icons on this "year-at-a-glance" are used in the curriculum charts that follow to indicate when outcomes or groups of outcomes can be taught - all year or anytime throughout the year; fall; winter; and/or spring

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All Year

HOW THE ENGLISH LANGUAGE ARTS CURRICULUM CHART IS ORGANIZED

The Learning Outcomes that follow from **English Language Arts must** be taught throughout the FALL, WINTER and SPRING seasons. Learning outcomes must be grounded in Nehiyaw Ways of Knowing and Land Based Learning.

The content from Land Based Learning, Nehiyaw Ways of Knowing, Social Studies and Science should be applied to the **English Language Arts** outcomes. Throughout the year, teachers will collaborate and generate more/other ideas that will value add to the suggested connections. In some cases, specific reference has been made to a particular season, although most Essential Learning Outcomes (ELOs) in English Language Arts should be taught/reinforced all year long.

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning ELO rows are highlighted
GENERAL OUTCOME 1 **Students will listen, speak, read, write, view and represent to explore thoughts, ideas, feelings and experiences.**			
1.1 Discover and Explore			
Express ideas and develop understanding	revise understanding and expression of ideas by connecting new and prior knowledge and experiences		
	review, reread, discuss and reflect on oral, print and other media texts to explore, confirm or revise understanding		
	seek out and consider diverse ideas, opinions and experiences to develop and extend own ideas, opinions and experiences		
Experiment with language and forms	discuss and respond to ways that forms of oral, print and other media texts enhance or constrain the development and communication of ideas, information and experiences		
Express preferences	pursue personal interest in specific genres by particular writers, artists, storytellers and filmmakers		
Set goals	examine and reflect on own growth in effective use of language to revise and extend personal goals		

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning ELO rows are highlighted
	1.2 Clarify and Extend		
Consider others' ideas	acknowledge the value of the ideas and opinions of others in exploring and extending personal interpretations and perspectives		
Combine ideas	exchange ideas and opinions to clarify understanding and to broaden personal perspectives		
Extend understanding	reconsider and revise initial understandings and responses in light of new ideas, information and feedback from others		
	GENERAL OUTCOME 2 **Students will listen, speak, read, write, view and represent to comprehend and respond personally and critically to oral, print and other media texts.**		
	2.1 Use Strategies and Cues		
Use prior knowledge	**use strategies to supplement and extend prior knowledge and experiences when interpreting new ideas and information**		
	use knowledge of authors, forms and genres, developed during previous reading, to direct and extend reading experiences		
Use comprehension strategies	**enhance understanding by paraphrasing main ideas and supporting details, and by rereading and discussing relevant passages**		
	monitor understanding; skim, scan or read slowly and carefully, as appropriate, to enhance comprehension		
	take notes, make outlines and use such strategies as read, recite, review to comprehend and remember ideas and information		
Use textual cues	identify and use visual and textual cues in reference materials, such as catalogues, databases, web sites, thesauri and writers' handbooks, to access information effectively and efficiently		
	identify and use structural features of a variety of oral, print and other media texts, such as newspapers, magazines, instruction booklets, advertisements and schedules, encountered in everyday life to access ideas and information and to read with purpose		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning ELO rows are highlighted
Use phonics and structural analysis	**choose and use strategies for word identification, vocabulary development and spelling that either build on specific strengths or address areas for improvement**		
Use references	use a thesaurus to extend vocabulary and locate appropriate words that express particular aspects of meaning		
	2.2 Respond to Texts		
Experience various texts	**experience oral, print and other media texts from a variety of cultural traditions and genres, such as magazine articles, diaries, drama, poetry, Internet passages, fantasy, nonfiction, advertisements and photographs**		
	write and represent narratives from other points of view		
	expect that there is more than one interpretation for oral, print and other media texts, and discuss other points of view		
	explain connections between own interpretation and information in texts, and infer how texts will influence others		
	make connections between biographical information about authors, illustrators, storytellers and filmmakers and their texts		
Construct meaning from texts	**interpret the choices and motives of characters portrayed in oral, print and other media texts, and examine how they relate to self and others**		
	identify and describe characters' attributes and motivations, using evidence from the text and personal experiences		
	discuss various ways characters are developed and the reasons for and plausibility of character change		
	compare two similar oral, print or other media texts by considering the characters, plot, conflicts and main ideas		

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning ELO rows are highlighted
Appreciate the artistry of texts	discuss how techniques, such as word choice, balance, camera angles, line and framing, communicate meaning and enhance effects in oral, print and other media texts		
	identify ways that characters can be developed, and discuss how character, plot and setting are interconnected and mutually supportive		
	identify and discuss how word choice and order, figurative language, plot, setting and character work together to create mood and tone		
	2.3 Understand Forms, Elements and Techniques		
Understand forms and genres	**discuss how the choice of form or genre of oral, print and other media texts is appropriate to purpose and audience**		
	compare the usefulness of different types of media texts		
Understand techniques and elements	distinguish theme from topic or main idea in oral, print and other media texts		
	identify and explain characters' qualities and motivations, by considering their words and actions, their interactions with other characters and the author's or narrator's perspective		
	compare and contrast the different perspectives provided by first and third person narration		
	summarize the content of media texts, and discuss the choices made in planning and producing them		
Experiment with language	identify creative uses of language and visuals in popular culture, such as commercials, rock videos and magazines; explain how imagery and figurative language, such as hyperbole, create tone and mood		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning ELO rows are highlighted
	2.4 Create Original Text		
Generate ideas	create oral, print and other media texts related to issues encountered in texts and in own life		
Elaborate on the expression of ideas	retell oral, print and other media texts from different points of view		
Structure texts	create oral, print and other media texts with both main and minor characters		
	choose forms or genres of oral, print or other media texts for the particular affects they will have on audiences and purposes		
	GENERAL OUTCOME 3 **Students will listen, speak, read, write, view and represent to manage ideas and information.**		
	3.1 Plan and Focus		
Focus attention	experiment with several ways to focus a topic, and select a form appropriate to audience and purpose		
	identify and trace the development of arguments, opinions or points of view in oral, print and other media texts		
Determine information needs	select the most appropriate information sources for topic, audience, purpose and form		
Plan to gather information	choose a plan to access, gather and record information, according to self-selected parameters		
	3.2 Select and Process		
Use a variety of sources	**obtain information from a variety of sources, such as adults, peers, advertisements, magazines, lyrics, formal interviews, almanacs, broadcasts and videos, to explore research questions**		
Access information	**expand and use a variety of tools and text features, such as subtitles, margin notes, key words, electronic searches, previews, reviews, visual effects and sound effects, to access information**		
	record key ideas and information from oral, print and other media texts, avoiding overuse of direct quotations		

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning ELO rows are highlighted
Access information	adjust rate of reading or viewing to suit purpose and density of information in print or other media texts		
Evaluate sources	**develop and use criteria for evaluating the usefulness, currency and reliability of information for a particular research project**		
	3.3 Organize, Record and Evaluate		
Organize information	organize ideas and information creatively, as well as logically, to develop a comparison or chronology, or to show a cause–effect relationship		
	organize ideas and information to establish an overall impression or point of view in oral, print and other media texts		
Record information	make notes in point form, summarizing major ideas and supporting details; reference sources		
	discard information that is irrelevant for audience, purpose, form or point of view		
	use a consistent and approved format to give credit for quoted and paraphrased ideas and information		
Evaluate information	**evaluate the relevance and importance of gathered information; address information gaps**		
	incorporate new information with prior knowledge and experiences to develop new understanding		
	3.4 Share and Review		
Share ideas and information	communicate ideas and information in a variety of oral, print and other media texts, such as interviews, minilessons and documentaries		
	integrate appropriate visual, print and/or other media to inform and engage the audience		
Review research process	**assess the research process, and consider alternative ways of achieving research goals**		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning ELO rows are highlighted
GENERAL OUTCOME 4 **Students will listen, speak, read, write, view and represent to enhance the clarity and artistry of communication.**			
4.1 Enhance and Improve			
Appraise own and others' work	share draft oral, print and other media texts in a way that will elicit useful feedback		
	evaluate how particular content features contribute to, or detract from, the overall effectiveness of own and others' oral, print and other media texts; make and suggest revisions		
Revise and edit	**revise by adding words and phrases that emphasize important ideas or create dominant impressions**		
	revise to enhance sentence variety, word choice and appropriate tone		
	enhance the coherence and impact of documents, using electronic editing functions		
	use paragraph structures to demonstrate unity and coherence		
Enhance legibility	**vary handwriting style and pace, depending on the context, audience and purpose**		
	choose an effective format for documents, depending on the content, audience and purpose		
Expand knowledge of language	explore and explain ways that new words, phrases and manners of expression enter the language as a result of factors, such as popular culture, technology, other languages		
	infer the literal and figurative meaning of words in context, using idioms, analogies, metaphors and similes		
Enhance artistry	experiment with figurative language, voice, sentence patterns, camera angle and music to create an impression or mood		

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning ELO rows are highlighted
	4.2 Attend to Conventions		
Attend to grammar and usage	use words and phrases to modify, clarify and enhance ideas and descriptions in own writing		
	use a variety of simple, compound and complex sentence structures to communicate effectively, and to make writing interesting		
	use correct pronoun– antecedent agreement in own writing		
	use verb tenses consistently throughout a piece of writing		
Attend to spelling	**develop a systematic and effective approach to studying and remembering the correct spelling of key words encountered in a variety of print and other media texts**		
	use knowledge of spelling generalizations and how words are formed to spell technical terms and unfamiliar words in own writing		
	identify the use of spelling variants in print and other media texts, and discuss the effectiveness depending on audience and purpose		
Attend to capitalization and punctuation	**use hyphens to break words at the end of lines, and to make a new word from two related words in own writing**		
	identify semicolons, dashes and hyphens when reading, and use them to assist comprehension		
	use parentheses appropriately in own writing		
	use appropriate capitalization and punctuation for referencing oral, print and other media texts		
	4.3 Present and Share		
Present information	**plan and facilitate small group and short, whole class presentations to share information**		
Enhance presentation	**present information to achieve a particular purpose and to appeal to interest and background knowledge of reader or audience**		
Use effective oral and visual communication	**plan and shape presentations to achieve particular purposes or effects, and use feedback from rehearsals to make modifications**		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning ELO rows are highlighted
Demonstrate attentive listening and viewing	**anticipate the organizational pattern of presentations, and identify important ideas and supporting details**		
	use appropriate verbal and nonverbal feedback to respond respectfully		
GENERAL OUTCOME 5 **Students will listen, speak, read, write, view and represent to respect, support and collaborate with others.**			
5.1 Respect Others and Strengthen Community			
Appreciate diversity	compare own with others' understanding of people, cultural traditions and values portrayed in oral, print and other media texts		
	clarify and broaden perspectives and opinions, by examining the ideas of others		
Relate texts to culture	**compare ways in which oral, print and other media texts reflect specific elements of cultures or periods in history**		
Celebrate accomplishments and events	**participate in organizing and celebrating special events, recognizing the appropriateness and significance of language arts**		
Use language to show respect	**use inclusive language and actions that demonstrate respect for people of different races, cultures, genders, ages and abilities**		
5.2 Work Within a Group			
Cooperate with others	propose ideas or advocate points of view that recognize the ideas of others and advance the thinking of the group		
	use opportunities as a group member to contribute to group goals and extend own learning		
Work in groups	**contribute ideas, knowledge and strategies to identify group information needs and sources**		
	organize and complete tasks cooperatively by defining roles and responsibilities, negotiating to find the basis for agreement, setting objectives and time frames, and reviewing progress		
Evaluate group process	**evaluate the quality of own contributions to group process, and offer constructive feedback to others; propose suggestions for improvement**		

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FALL

GRADE EIGHT

All Year	Fall	Winter	Spring
English Language Arts	Connect to themes from Social Studies, Science, Math and Land Based Learning and Cree ways of knowing and being		
Social Studies	From Isolation to Adaptation: Japan	Origins of a Western Worldview: Renaissance Europe	Worldviews in Conflict: The Spanish and the Aztecs
Mathematics	Number Sense	Patterns and Relations	Shape and Space Statistics and Probability
Science	Unit A: Mix and Flow of Matter Unit B: Cells and Systems	Unit C: Light and Optical Systems Unit D: Mechanical Systems	Unit D: Mechanical Systems Unit E: Freshwater and Saltwater Systems

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Fall

HOW THE FALL CURRICULUM CHARTS ARE ORGANIZED

The Learning Outcomes that follow from **Social Studies** must be taught during the FALL season. Learning outcomes must be grounded in Nehiyaw Ways of Knowing and Land Based Learning.

These **Social Studies** charts include suggested, although not exhaustive, connections to Nehiyaw Ways of Knowing and Land Based Learning. Throughout the year, teachers will collaborate and generate more/other ideas that will value add to the suggested connections.

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
8.1 FROM ISOLATION TO ADAPTATION: JAPAN			
GENERAL OUTCOME: Through an examination of Japan, students will demonstrate an understanding and appreciation of the ways in which beliefs, values and knowledge shape worldviews and contribute to a society's isolation or adaptation.			**Compare and contrast Japan with Indigenous communities**
Values and Attitudes			
8.1.1 Appreciate the roles of time and geographic location in shaping a society's worldview (C, I, TCC, LPP)			**Relate to Indigenous Communities and how geographic location and isolation impacts their worldview**
8.1.2 Appreciate how a society's worldview can foster the choice to remain an isolated society (C, I, TCC)			**Strong beliefs and values foster choices communities make**
8.1.3 Appreciate how models of governance and decision making reflect a society's worldview (C, I, TCC, PADM)			Compare to Indigenous models of governance and worldviews
8.1.4 Appreciate how a society's worldview shapes individual citizenship and identity (C, I, TCC)			

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8

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
	Knowledge and Understanding		
8.1.5 Analyze the effects of cultural isolation during the Edo period by exploring and reflecting upon the following questions and issues:	• In what ways did Japan isolate itself from the rest of the world? (PADM, LPP, CC)		
	• How did isolation during the Edo period lead to changes in Japan? (CC, PADM)		
	• How did the changes resulting from isolation affect Japan economically, politically and socially during the Edo period? (ER, PADM, CC, I)		
	• **How did the physical geography of Japan affect its worldview? (LPP, PADM, TCC)**		**Compare to Indigenous world view. Japan was isolated and were able to keep traditions to themselves and were not influenced by others and were self sufficient and didn't need anyone else. Prior to Europeans coming to Canada, the Indigenous peoples were self sufficient and able to keep traiditons to themselves.**
	• **How did the shogun use the feudal system and the hierarchical social classes to maintain control of Japan? (PADM, CC)**		**Relate to the British colonization**
8.1.6 Analyze the effects that rapid adaptation had on traditionally isolated Japan during the Meiji period by exploring and reflecting upon the following questions and issues:	• What were the motivations for the radical changes in Japan's model of organization during the Meiji period? (ER, CC, PADM)		
	• **How did Japan adapt to changes brought on by the transition from feudal to modern models of organization? (CC, TCC, I)**		
	• How did the changes resulting from adaptation affect Japan economically, politically and socially during the Meiji period? (ER, CC, PADM)		
	• In what ways did changes resulting from isolation in the Edo period compare to changes resulting from adaptation in the Meiji period? (CC, TCC, I)		
	• What challenges emerged for the Japanese in maintaining traditional cultural aspects of their society while undergoing rapid change? (CC, I, TCC)		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
SKILLS AND PROCESSES FOR SOCIAL STUDIES			
Dimensions of Thinking			
8.S.1 Develop skills of critical thinking and creative thinking:	• analyze the validity of information based on context, bias, source, objectivity, evidence and reliability to broaden understanding of a topic or an issue		
	• evaluate ideas, information and positions from multiple perspectives		
	• demonstrate the ability to analyze local and current affairs		
	• **re-evaluate personal opinions to broaden understanding of a topic or an issue**		
	generate creative ideas and strategies in individual and group activities - access diverse viewpoints on particular topics by using appropriate technologies		
8.S.2 Develop skills of historical thinking:	• distinguish cause, effect, sequence and correlation in historical events, including the long- and short-term causal relations		
	• use historical and community resources to organize the sequence of historical events		
	• analyze the historical contexts of key events of a given time period - create a simulation or a model by using technology that permits the making of inferences - identify patterns in organized information		**Project-based assignment**
8.S.3 Develop skills of geographic thinking:	• interpret historical maps to broaden understanding of historical events		
	• **use thematic maps to describe cultural and political regions**		**About how treaties were distinguished**
	• construct and interpret various maps to broaden understanding of given topics		

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
8.S.3 Develop skills of geographic thinking: (continued)	• define geographic problems and issues and pose geographic questions		
	• **use geographic tools, such as Geographic Information Systems (GIS) software, to assist in preparing graphs and maps** **- access and operate multimedia applications and technologies from stand-alone and online sources; e.g., GIS**		
8.S.4. Demonstrate skills of decision making and problem solving:	• demonstrate skills of compromise and devise strategies to reach group consensus		
	• propose and apply new ideas and strategies, supported with facts and reasons, to contribute to problem solving and decision making		
	• propose and apply strategies or options to solve problems and deal with issues		
	• **participate in and predict outcomes of problem-solving and decision-making scenarios** **- articulate clearly a plan of action to use technology to solve a problem** **- identify the appropriate materials and tools to use in order to accomplish a plan of action** **- evaluate choices and the progress in problem solving, then redefine the plan of action as appropriate** **- use networks to brainstorm, plan and share ideas with group members**		
Social Participation as a Democratic Practice			
8.S.5 Demonstrate skills of cooperation, conflict resolution and consensus building:	• **identify and use a variety of strategies to resolve conflicts peacefully and fairly**		
	• consider the needs and perspectives of others		
	• demonstrate leadership within groups where appropriate - access, retrieve and share information from electronic sources, such as common files		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
8.S.6 Develop age-appropriate behaviour for social involvement as responsible citizens contributing to their community:	• **volunteer with organizations, projects and activities that ensure the growth and vitality of their community**		
	Research for Deliberative Inquiry		
8.S.7 Apply the research process:	• **integrate and synthesize concepts to provide an informed point of view on a research question or an issue**		
	• develop a position that is supported by information gathered through research		
	• draw conclusions based upon research and evidence		
	• determine how information serves a variety of purposes and that the accuracy or relevance of information may need verification		
	• organize and synthesize researched information		
	• formulate new questions as research progresses		
	• practise the responsible and ethical use of information and technology		
	• **include and organize references as part of research** **- plan and conduct a search, using a wide variety of electronic sources** **- demonstrate the advanced search skills necessary to limit the number of hits desired for online and offline databases; for example, the use of "and" or "or" between search topics and the choice of appropriate search engines for the topic** **- develop a process to manage volumes of information that can be made available through electronic sources** **- evaluate the relevance of electronically accessed information to a particular topic** **- make connections among related, organized data, and assemble various pieces into a unified message** **- refine searches to limit sources to a manageable number** **- analyze and synthesize information to create a product** **- access and retrieve information through the electronic network**		

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
	Communication		
8.S.8 Demonstrate skills of oral, written and visual literacy:	• communicate in a persuasive and engaging manner through speeches, multimedia presentations and written and oral reports, taking particular audiences and purposes into consideration		
	• use skills of informal debate to persuasively express differing viewpoints regarding an issue		
	• **elicit, clarify and respond appropriately to questions, ideas and multiple points of view presented in discussions**		
	• offer reasoned comments related to a topic of discussion		
	• **listen to others to understand their points of view**		
8.S.9 Develop skills of media literacy:	• **examine techniques used to enhance the authority and authenticity of media messages**		
	• examine the values, lifestyles and points of view represented in a media message		
	• analyze the impact of television, the Internet, radio and print media on a particular current affairs issue		

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Fall

HOW THE FALL CURRICULUM CHARTS ARE ORGANIZED

The Learning Outcomes that follow from **Mathematics** must be taught during the FALL season. Learning outcomes must be grounded in Nehiyaw Ways of Knowing and Land Based Learning.

The content from Land Based Learning, Nehiyaw Ways of Knowing, Social Studies and Science should be applied to the **Mathematics** outcomes. Throughout the year, teachers will collaborate and generate more/other ideas that will value add to the suggested connections.

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
	NUMBER		
Develop number sense	**1. Demonstrate an understanding of perfect squares and square roots, concretely, pictorially and symbolically (limited to whole numbers). [C, CN, R, V]***		
	2. Determine the approximate square root of numbers that are not perfect squares (limited to whole numbers). [C, CN, ME, R, T] [ICT: P2–3.4		
	3. Demonstrate an understanding of percents greater than or equal to 0%, including greater than 100%. [CN, PS, R, V]		
	4. Demonstrate an understanding of ratio and rate. [C, CN, V]		
	5. Solve problems that involve rates, ratios and proportional reasoning. [C, CN, PS, R]		
	6. Demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially and symbolically. [C, CN, ME, PS]		
	7. Demonstrate an understanding of multiplication and division of integers, concretely, pictorially and symbolically. [C, CN, PS, R, V]		

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Fall

HOW THE FALL CURRICULUM CHARTS ARE ORGANIZED

The Learning Outcomes that follow from **Science** must be taught during the FALL season. Learning outcomes must be grounded in Nehiyaw Ways of Knowing and Land Based Learning. Note that all Attitudes and Skills listed at the end of each science unit are important and should be included as part of the unit of study, but are not highlighted as essential because it was inferred that they have been taught in elementary grades or are cross curricular.

These **Science** charts include suggested, although not exhaustive, connections to Nehiyaw Ways of Knowing and Land Based Learning. Throughout the year, teachers will collaborate and generate more/other ideas that will value add to the suggested connections.

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
	UNIT A: MIX AND FLOW OF MATTER *BEGINNNING OF FALL (SEPTEMBER)		
	SPECIFIC OUTCOMES FOR SCIENCE, TECHNOLOGY AND SOCIETY		
1. Investigate and describe fluids used in technological devices and everyday materials	• **investigate and identify examples of fluids in household materials, technological devices, living things and natural environments**		**Water as a source of life, Rubbing alcohol after shaving, Ashes as a cleaning substance and charcoal.**
	• **explain the Workplace Hazardous Materials Information System (WHMIS) symbols for labelling substances; and describe the safety precautions to follow when handling, storing and disposing of substances at home and in the laboratory**		**Translate terms and symbols into Cree**
	• describe examples in which materials are prepared as fluids in order to facilitate transport, processing or use (e.g., converting mineral ores to liquids or slurries to facilitate transport, use of paint solvents to facilitate mixing and application of pigments, use of soapy water to carry away unwanted particles of material)		
	• identify properties of fluids that are important in their selection and use (e.g., lubricant properties of oils, compressibility of gases used in tires)		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution	• **distinguish among pure substances, mixtures and solutions, using common examples (e.g., identify examples found in households)**		**Mint tea, Rat root, jams, pop, milk**
	• **investigate the solubility of different materials, and describe their concentration (e.g., describe concentration in grams of solute per 100 mL of solution)**		
	• **investigate and identify factors that affect solubility and the rate of dissolving a solute in a solvent (e.g., identify the effect of temperature on solubility; identify the effect of particle size and agitation on rate of dissolving)**		
	• relate the properties of mixtures and solutions to the particle model of matter (e.g., recognize that the attraction between particles of solute and particles of solvent helps keep materials in solution)		
3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter	• investigate and compare fluids, based on their viscosity and flow rate, and describe the effects of temperature change on liquid flow		
	• **observe the mass and volume of a liquid, and calculate its density using the formula d = m/v [Note: This outcome does not require students to perform formula manipulations or solve for unknown terms other than the density.]**		**Measuring land-based medicines natural to the Cree people. Trying to determine the quantity of different leaves or roots to combine into making medicines.**
	• **compare densities of materials; and explain differences in the density of solids, liquids and gases, using the particle model of matter**		
	• describe methods of altering the density of a fluid, and identify and interpret related practical applications (e.g., describe changes in buoyancy resulting from increasing the concentration of salt in water)		
	• **describe pressure as a force per unit area by using the formula p = F/A, and describe applications of pressure in fluids and everyday situations (e.g., describe pressure exerted by water in hoses, air in tires, carbon dioxide in fire extinguishers; explain the effects of flat heels and stiletto heels, using the concept of pressure)**		
	• investigate and compare the compressibility of liquids and gases		

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4. Identify, interpret and apply technologies based on properties of fluids	• describe technologies based on the solubility of materials (e.g., mining salt or potash by dissolving)		
	• describe and interpret technologies based on flow rate and viscosity (e.g., heavy oil extraction from tar sands, development of motor oils for different seasons, ketchup/mustard squeeze bottles)		
	• describe and interpret technologies for moving fluids from one place to another (e.g., intravenous lines, pumps and valves, oil and gas pipelines)		
	• construct a device that uses the transfer of fluids to apply a force or to control motion (e.g., construct a model hydraulic lift; construct a submersible that can be made to sink or float by transfer of a fluid; construct a model of a pump)		
SPECIFIC OUTCOMES FOR SKILLS			
Initiating and Planning Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	• define practical problems (e.g., How can we remove a salt coating from a bicycle or vehicle?)		
	• identify questions to investigate, arising from practical problems and issues (e.g., identify questions, such as: "What factors affect the speed with which a material dissolves?")		
	• phrase questions in a testable form, and clearly define practical problems (e.g., rephrase a question, such as: "Is salt very soluble?" to become "What is the most salt that can be dissolved in one litre of water at 23°C?")		
	• **design an experiment, and identify the major variables (e.g., design or apply a procedure for measuring the solubility of different materials)**		**Dissolving maple syrup using different cooking methods: baking, boiling, stirring, blending**
Performing and Recording Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	• carry out procedures, controlling the major variables (e.g., carry out a test of the viscosity of different fluids)		
	• use instruments effectively and accurately for collecting data (e.g., measure the mass and volume of a given sample of liquid)		
	• construct and test prototype designs and systems (e.g., construct a model submarine that is controlled by an air hose connected to a syringe)		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
Performing and Recording Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data (continued)	• use tools and apparatus safely (e.g., wear safety goggles during investigations of solution properties)		
	• organize data, using a format that is appropriate to the task or experiment (e.g., demonstrate the use of a database or spreadsheet for organizing information)		
Analyzing and Interpreting Analyze qualitative and quantitative data, and develop and assess possible explanations	• identify and suggest explanations for discrepancies in data (e.g., explain a loss in the volume of a liquid, by identifying such factors as evaporation or absorption by a filtering material)		
	• predict the value of a variable, by interpolating or extrapolating from graphical data (e.g., extrapolate results to predict how much solute will dissolve in a given solvent at a given temperature)		
	• identify new questions and problems that arise from what was learned (e.g., identify questions, such as: "What techniques are used to remove pollutants from air and water?")		
	• identify and evaluate potential applications of findings		
Communication and Teamwork Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	• identify and correct practical problems in the way a prototype or constructed device functions (e.g., identify and seal leaks in a model fluid system)		
	• work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise		
	• communicate questions, ideas, intentions, plans and results, using lists, notes in point form, sentences, data tables, graphs, drawings, oral language and other means (e.g., show the differences in flow rate, using a data table and diagrams)		
SPECIFIC OUTCOMES FOR ATTITUDES			
Interest in Science	Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., attempt at home to repeat or extend a science investigation done at school; investigate applications of fluid properties in technologies used in the local community)		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
Mutual Respect	Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., show awareness of and respect for aboriginal perspectives on the link between humans and the environment)		
Scientific Inquiry	Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., regularly repeat measurements or observations to increase the precision of evidence)		
Collaboration	Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., assume responsibility for their share of work in preparing for investigations and in gathering and recording evidence; consider alternative ideas and approaches suggested by members of the group; share the responsibility for difficulties encountered in an activity)		
Stewardship	Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., recognize that the disposal of materials through drains creates needs for waste water treatment and may result in downstream environmental impacts)		
Safety	Show concern for safety in planning, carrying out and reviewing activities (e.g., take the time to organize their work area so that accidents can be prevented; read the labels on materials before using them, and ask for help if safety symbols are not clear or understood; clean their work area during and after an activity)		
UNIT B: CELLS AND SYSTEMS *LATER PART OF FALL (OCTOBER/NOVEMBER)			
SPECIFIC OUTCOMES FOR SCIENCE, TECHNOLOGY AND SOCIETY			
1. Investigate living things; and identify and apply scientific ideas used to interpret their general structure, function and organization	• investigate and describe example scientific studies of the characteristics of living things (e.g., investigate and describe an ongoing scientific study of a locally-found organism)		
	• **apply the concept of system in describing familiar organisms and analyzing their general structure and function**		**Use local examples such as fish or beaver living in an ecosystem. Emphasize the interconnectedness of people, animals, plants, the air and mother earth.**

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
1. Investigate living things; and identify and apply scientific ideas used to interpret their general structure, function and organization (continued)	• **illustrate and explain how different organisms have similar functions that are met in a variety of ways (e.g., recognize food gathering as a common function of animals, and note a variety of food-gathering structures)**		**Illustrate and explain through a powerpoint presentation how local animals gather food (eg. birds, fish, large mammals, bear, insects, etc.) and compare the similarities and differences in their food gathering techniques. Explain how their food gathering techniques are similar or different to humans. Finally, complare to how local plants gather food.**
2. Investigate and describe the role of cells within living things	• **describe the role of cells as a basic unit of life**		
	• **analyze similarities and differences between single-celled and multicelled organisms (e.g., compare, in general terms, an amoeba and a grizzly bear, a single-celled alga and a poplar tree)**		**Focus on local plants and animals**
	• **distinguish between plant and animal cells (e.g., distinguish between cell walls and cell membranes)**		
	• **describe the movement of gases and liquids into and out of cells during diffusion and osmosis, based on concentration differences [Note: This outcome requires a general understanding of processes, not a detailed analysis of mechanisms.]**		**Explain diffusion and osmosis using concrete examples such as diffusion of smoke in the air when building a fire (diffusion), or watering a tree and the water travels up the roots and trunk and demonstrates the circulation system**
	• **examine plant and animal structures; and identify contributing roles of cells, tissues and organs**		
3. Interpret the healthy function of human body systems, and illustrate ways the body reacts to internal and external stimuli	• **describe, in general terms, body systems for respiration, circulation, digestion, excretion and sensory awareness (e.g., describe how blood is circulated throughout the body to carry oxygen and nutrients to the body's various tissues and organs)**		**Explore Indigenous knowledge related to taking care of the body naturally, using plants as medicine, etc. and how one system breaking down affects all other systems in the body**

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning FALL ELO rows are highlighted
3. Interpret the healthy function of human body systems, and illustrate ways the body reacts to internal and external stimuli (continued)	• **describe, in general terms, the role of individual organs and tissues in supporting the healthy functioning of the human body (e.g., the role of lungs in exchanging oxygen and carbon dioxide, the role of bronchia in providing a passageway for air)**		**Invite an Elder or knowledge keeper to share wisdom related to healthy functioning of the human body and roles of individual organs**
	• **describe ways in which various types of cells contribute to the healthy functioning of the human body (e.g., describe the roles of individual cells in nerves, muscle, blood, skin and bone)**		
	• **describe changes in body functions in response to changing conditions (e.g., changes in heart rate in response to exercise, change in metabolism in response to lower temperature, reflex responses to stimuli)**		**Chart changes in body functions of people engaged in different activities - eg hunting, participating in a feast, sleeping, etc. Form conclusions based on the data recorded in the chart**
4. Describe areas of scientific investigation leading to new knowledge about body systems and to new medical applications	• identify examples of research into functions and dysfunctions of human cells, organs or body systems		
	• describe ways in which research about cells, organs and systems has brought about improvements in human health and nutrition (e.g., development of medicines; immunization procedures; diets based on the needs of organs, such as the heart)		
	• investigate and describe factors that affect the healthy function of the human respiratory, circulatory and digestive systems (e.g., investigate the effect of illness, aging or air quality on the function of the respiratory system)		
SPECIFIC OUTCOMES FOR SKILLS			
Initiating and Planning Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	• identify questions to investigate (e.g., identify questions that arise from their own observations of plant and animal diversity)		
	• rephrase questions in a testable form (e.g., rephrase a question, such as: "Why this structure?" to become questions, such as: "How is this structure used by the organism?", "How would the organism be affected if this structure were absent or did not function?" or "What similar structures do we find in other organisms?")		
	• formulate operational definitions of major variables and other aspects of their investigations (e.g., define body systems in terms of the functions they perform)		

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Performing and Recording Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	• **use instruments—including microscopes—effectively and accurately for collecting data (e.g., use a microscope to produce a clear image of cells)**		
	• **estimate measurements (e.g., estimate the size of an object viewed under a microscope)**		
	• observe and record data, and produce simple line drawings (e.g., draw cells and organisms)		
	• organize data, using a format that is appropriate to the task or experiment (e.g., compare the structure and function of two or more organisms, using charts and drawings)		
Analyzing and Interpreting Analyze qualitative and quantitative data, and develop and assess possible explanations	• identify strengths and weaknesses of different methods of collecting and displaying data (e.g., compare methods of measuring heart rate)		
	• identify and suggest explanations for discrepancies in data (e.g., explain variations in the heart rate and blood pressure of the same individual at different times during the day)		
	• compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs and line graphs (e.g., prepare charts that compare structures of different organisms)		
	• identify new questions and problems that arise from what was learned		
Communication and Teamwork Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	• receive, understand and act on the ideas of others (e.g., adopt and use an agreed procedure for preparing diagrams and charts)		
	• communicate questions, ideas, intentions, plans and results, using lists, notes in point form, sentences, data tables, graphs, drawings, oral language and other means		
	• work cooperatively with team members to develop and carry out a plan (e.g., prepare a class presentation on the digestive system, including a model constructed by the group)		
	• evaluate individual and group processes used in planning, problem solving, decision making and completing a task (e.g., evaluate processes used in completing a cooperative group project)		

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	SPECIFIC OUTCOMES FOR ATTITUDES		
Interest in Science	Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., select and explore media on topics related to the diversity of living things and the maintenance of health; express interest in science-related/ technology-related careers that contribute to the welfare of living things)		
Mutual Respect	Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., recognize that a wide range of people working in different fields have contributed to scientific and medical knowledge)		
Scientific Inquiry	Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., consider a wide variety of possible interpretations of their observations of animal structures and functions; critically evaluate inferences and conclusions, basing their arguments on fact rather than opinion)		
Collaboration	Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., assume responsibility for their share of work in preparing for investigations and in gathering and recording evidence; consider alternative ideas and approaches suggested by members of the group; share the responsibility for difficulties encountered in an activity)		
Stewardship	Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., show interest in the health of individuals in their family and community; assume personal responsibility for the impact of their actions on the health of others and for the welfare and survival of other living things)		
Safety	Show concern for safety in planning, carrying out and reviewing activities (e.g., wear proper safety attire, without having to be reminded; follow appropriate safety procedures in handling biological material; clean their work area during and after an activity; ensure the proper disposal of materials)		

8

WINTER

GRADE EIGHT

	All Year	Fall	Winter	Spring
English Language Arts	Connect to themes from Social Studies, Science, Math and Land Based Learning and Cree ways of knowing and being			
Social Studies		From Isolation to Adaptation: Japan	Origins of a Western Worldview: Renaissance Europe	Worldviews in Conflict: The Spanish and the Aztecs
Mathematics		Number Sense	Patterns and Relations	Shape and Space Statistics and Probability
Science		Unit A: Mix and Flow of Matter Unit B: Cells and Systems	Unit C: Light and Optical Systems Unit D: Mechanical Systems	Unit D: Mechanical Systems Unit E: Freshwater and Saltwater Systems

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Winter

HOW THE WINTER CURRICULUM CHARTS ARE ORGANIZED

The Learning Outcomes that follow from **Social Studies** must be taught during the WINTER season. Learning outcomes must be grounded in Nehiyaw Ways of Knowing and Land Based Learning.

These **Social Studies** charts include suggested, although not exhaustive, connections to Nehiyaw Ways of Knowing and Land Based Learning. Throughout the year, teachers will collaborate and generate more/other ideas that will value add to the suggested connections.

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning WINTER ELO rows are highlighted
8.1 ORIGINS OF A WESTERN WORLDVIEW: RENAISSANCE EUROPE			
GENERAL OUTCOME: **Through an examination of Renaissance Europe, students will demonstrate an understanding and appreciation of how the exchange of ideas and knowledge contributed to shaping the worldview of the Western world.**			
Values and Attitudes			
8.2.1 Apreciate how Renaissance Europe formed the basis for the worldview of the Western world (C, TCC)			
8.2.2 Demonstrate a willingness to consider differing beliefs, values and worldviews (C, I)			
8.2.3 Recognize how beliefs and values are shaped by time, geographic location and societal context (C, TCC, LPP)			

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	Knowledge and Understanding		
8.2.4 Examine, critically, the factors that shaped the worldview evolving in western Europe during the Renaissance by exploring and reflecting upon the following questions and issues:	• **What was the Renaissance? (TCC, LPP)**		
	• **How did the Renaissance spark the growth and exchange of ideas and knowledge across Europe (i.e., astronomy, mathematics, science, politics, religion, arts)? (TCC, ER, PADM, GC)**		**How did the Indigenous community influence the growth and exhange of ideas needs to discussed as well.**
	• How did the physical geography of Renaissance Europe affect trade and competition among European countries? (LPP, TCC)		
	• **How did increased trade lead to the emergence of powerful city-states (i.e., Florence, Venice, Genoa)? (TCC, CC, ER)**		
	• **In what ways did thinkers and philosophers influence society in the development of a humanist worldview during the Renaissance? (GC, I)**		**Compare the humanistic worldview to the Indigenous worldview**
	• **In what ways were the Age of Discovery and the rise of imperialism expressions of an expansionist worldview? (TCC, PADM, LPP)**		**Compare imperialism and expansionism (students need to understand these terms) to the Indigenous worldview**
	• In what ways did exploration and intercultural contact during the Renaissance affect the citizenship and identity of Europeans? (C, I, GC, LPP, TCC)		
	SKILLS AND PROCESSES FOR SOCIAL STUDIES		
	Dimensions of Thinking		
8.S.1 Develop skills of critical thinking and creative thinking:	• analyze the validity of information based on context, bias, source, objectivity, evidence and reliability to broaden understanding of a topic or an issue		
	• evaluate ideas, information and positions from multiple perspectives		
	• demonstrate the ability to analyze local and current affairs		

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8.S.1 Develop skills of critical thinking and creative thinking: (continued)	• re-evaluate personal opinions to broaden understanding of a topic or an issue		
	generate creative ideas and strategies in individual and group activities - access diverse viewpoints on particular topics by using appropriate technologies		
8.S.2 Develop skills of historical thinking:	• distinguish cause, effect, sequence and correlation in historical events, including the long- and short-term causal relations		
	• use historical and community resources to organize the sequence of historical events		
	• analyze the historical contexts of key events of a given time period - create a simulation or a model by using technology that permits the making of inferences - identify patterns in organized information		
8.S.3 Develop skills of geographic thinking:	• interpret historical maps to broaden understanding of historical events		
	• use thematic maps to describe cultural and political regions		
	• construct and interpret various maps to broaden understanding of given topics		
	• define geographic problems and issues and pose geographic questions		
	• use geographic tools, such as Geographic Information Systems (GIS) software, to assist in preparing graphs and maps - access and operate multimedia applications and technologies from stand-alone and online sources; e.g., GIS		
8.S.4. Demonstrate skills of decision making and problem solving:	• demonstrate skills of compromise and devise strategies to reach group consensus		
	• propose and apply new ideas and strategies, supported with facts and reasons, to contribute to problem solving and decision making		
	• propose and apply strategies or options to solve problems and deal with issues		

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8.S.4. Demonstrate skills of decision making and problem solving: (continued)	• participate in and predict outcomes of problem-solving and decision-making scenarios - articulate clearly a plan of action to use technology to solve a problem - identify the appropriate materials and tools to use in order to accomplish a plan of action - evaluate choices and the progress in problem solving, then redefine the plan of action as appropriate - use networks to brainstorm, plan and share ideas with group members	❄	
Social Participation as a Democratic Practice			
8.S.5 Demonstrate skills of cooperation, conflict resolution and consensus building:	• identify and use a variety of strategies to resolve conflicts peacefully and fairly	❄	
	• consider the needs and perspectives of others		
	• demonstrate leadership within groups where appropriate - access, retrieve and share information from electronic sources, such as common files		
8.S.6 Develop age-appropriate behaviour for social involvement as responsible citizens contributing to their community:	• volunteer with organizations, projects and activities that ensure the growth and vitality of their community		
Research for Deliberative Inquiry			
8.S.7 Apply the research process:	• integrate and synthesize concepts to provide an informed point of view on a research question or an issue	❄	
	• develop a position that is supported by information gathered through research		
	• draw conclusions based upon research and evidence		
	• determine how information serves a variety of purposes and that the accuracy or relevance of information may need verification		
	• organize and synthesize researched information		

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8.S.7 Apply the research process: (continued)	• formulate new questions as research progresses		
	• practise the responsible and ethical use of information and technology		
	• include and organize references as part of research - plan and conduct a search, using a wide variety of electronic sources - demonstrate the advanced search skills necessary to limit the number of hits desired for online and offline databases; for example, the use of "and" or "or" between search topics and the choice of appropriate search engines for the topic - develop a process to manage volumes of information that can be made available through electronic sources - evaluate the relevance of electronically accessed information to a particular topic - make connections among related, organized data, and assemble various pieces into a unified message - refine searches to limit sources to a manageable number - analyze and synthesize information to create a product - access and retrieve information through the electronic network		
	Communication		
8.S.8 Demonstrate skills of oral, written and visual literacy:	• communicate in a persuasive and engaging manner through speeches, multimedia presentations and written and oral reports, taking particular audiences and purposes into consideration		
	• use skills of informal debate to persuasively express differing viewpoints regarding an issue		
	• elicit, clarify and respond appropriately to questions, ideas and multiple points of view presented in discussions		
	• offer reasoned comments related to a topic of discussion		
	• listen to others to understand their points of view		

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8.S.9 Develop skills of media literacy:	• examine techniques used to enhance the authority and authenticity of media messages		
	• examine the values, lifestyles and points of view represented in a media message		
	• analyze the impact of television, the Internet, radio and print media on a particular current affairs issue		

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Winter

HOW THE WINTER CURRICULUM CHARTS ARE ORGANIZED

The Learning Outcomes that follow from **Mathematics** must be taught during the WINTER season. Learning outcomes must be grounded in Nehiyaw Ways of Knowing and Land Based Learning.

The content from Land Based Learning, Nehiyaw Ways of Knowing, Social Studies and Science should be applied to the **Mathematics** outcomes. Throughout the year, teachers will collaborate and generate more/other ideas that will value add to the suggested connections.

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning WINTER ELO rows are highlighted
	PATTERNS AND RELATIONS		
General Outcome (Patterns): Use patterns to describe the world and to solve problems.	**1. Graph and analyze two-variable linear relations. [C, ME, PS, R, T,, V] [ICT: P2–3.3]**		
General Outcome (Variables and Equations): Represent algebraic expressions in multiple ways.	**2. Model and solve problems concretely, pictorially and symbolically, using linear equations of the form:** • **ax = b** • **x/a=b = , a ≠ 0** • **ax + b = c** • **/a +b = c, a ≠ 0** • **a(x + b) = c** **where a, b and c are integers.[C, CN, PS, V]**		

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Winter

HOW THE WINTER CURRICULUM CHARTS ARE ORGANIZED

The Learning Outcomes that follow from **Science** must be taught during the WINTER season. Learning outcomes must be grounded in Nehiyaw Ways of Knowing and Land Based Learning. Note that all Attitudes and Skills listed at the end of each science unit are important and should be included as part of the unit of study, but are not highlighted as essential because it was inferred that they have been taught in elementary grades or are cross curricular. Science outcomes identified in this chart also cross over to the SPRING season.

These **Science** charts include suggested, although not exhaustive, connections to Nehiyaw Ways of Knowing and Land Based Learning. Throughout the year, teachers will collaborate and generate more/other ideas that will value add to the suggested connections.

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning WINTER ELO rows are highlighted
	UNIT C: LIGHT AND OPTICAL SYSTEMS		
	SPECIFIC OUTCOMES FOR SCIENCE, TECHNOLOGY AND SOCIETY		
1. Investigate the nature of light and vision; and describe the role of invention, explanation and inquiry in developing our current knowledge	• **identify challenges in explaining the nature of light and vision (e.g., recognize that past explanations for vision involved conflicting ideas about the interaction of eyes and objects viewed; identify challenges in explaining upside-down images, rainbows and mirages)**		**Use sun dogs as an example**
	• investigate the development of microscopes, telescopes and other optical devices; and describe how these developments contributed to the study of light and other areas of science		
	• investigate light beams and optical devices, and identify phenomena that provide evidence of the nature of light (e.g., evidence provided by viewing the passage of light through dusty air or cloudy water)		
2. Investigate the transmission of light, and describe its behaviour using a geometric ray model	• **investigate how light is reflected, transmitted and absorbed by different materials; and describe differences in the optical properties of various materials (e.g., compare light absorption of different materials; identify materials that transmit light; distinguish between clear and translucent materials; identify materials that will reflect a beam of light as a coherent beam)**		**Focus on local materials that are found within the community and surrounding areas (sun glasses, Inuit traditional sunglasses to prevent snow blindness), color of clothing or buildings, muddy water or clear water, etc.**

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning WINTER ELO rows are highlighted
2. Investigate the transmission of light, and describe its behaviour using a geometric ray model (continued)	• measure and predict angles of reflection		
	• **investigate, measure and describe the refraction of light through different materials (e.g., measure differences in light refraction through pure water, salt water and different oils)**		**Explore traditional Indigenous stories about rainbows**
	• investigate materials used in optical technologies; and predict the effects of changes in their design, alignment or composition		
3. Investigate and explain the science of image formation and vision, and interpret related technologies	• **demonstrate the formation of real images, using a double convex lens, and predict the effects of changes in the lens position on the size and location of images (e.g., demonstrate a method to produce a magnified or reduced image by altering the placement of one or more lenses)**		
	• demonstrate and explain the use of microscopes; and describe, in general terms, the function of eyeglasses, binoculars and telescopes		
	• explain how objects are seen by the eye, and compare eyes with cameras (e.g., compare focusing mechanisms; compare the automatic functions of the eye with functions in an automatic camera)		
	• **compare the function and design of the mammalian eye with that of other vertebrates and invertebrates (e.g., amphibians; fish; squid; shellfish; insects, such as the housefly)**		
	• investigate and describe the development of new technologies to enhance human vision (e.g., laser surgery on eyes, development of technologies to extend night vision)		
	• investigate and interpret emerging technologies for storing and transmitting images in digital form (e.g., digital cameras, infrared imaging, remote imaging technologies)		
SPECIFIC OUTCOMES FOR SKILLS			
Initiating and Planning Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	• identify questions to investigate (e.g., ask about the role of eyeglasses in improving vision)		
	• define and delimit questions to facilitate investigation (e.g., rephrase a question, such as: "Is plastic the best material to use in eyeglasses?" to become "Which material refracts light the most?")		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning **WINTER ELO rows are highlighted**
Initiating and Planning Ask questions about the relationships between and among observable variables, and plan investigations to address those questions (continued)	• design an experiment, and identify the major variables	❄	
	• state a prediction and a hypothesis based on background information or an observed pattern of events (e.g., predict the effect of dissolved materials on the refraction of light in a liquid)		
	• formulate operational definitions of major variables and other aspects of their investigations (e.g., operationally define "refraction" and "beam of light")		
Performing and Recording Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	• carry out procedures, controlling the major variables		
	• observe and record data, and prepare simple line drawings (e.g., prepare a drawing of the path of a light beam toward and away from a mirror)		
	• use instruments effectively and accurately for collecting data (e.g., measure angles of reflection; use a light sensor to measure light intensity)		
	• organize data, using a format that is appropriate to the task or experiment (e.g., demonstrate use of a database or spreadsheet for organizing information)		
	• use tools and apparatus safely (e.g., use lasers only in ways that do not create a risk of light entering anyone's eyes)		
Analyzing and Interpreting Analyze qualitative and quantitative data, and develop and assess possible explanations	• predict the value of a variable by interpolating or extrapolating from graphical data (e.g., predict the angle of a refracted beam of light)		
	• identify strengths and weaknesses of different ways of collecting and displaying data (e.g., evaluate different approaches to testing a lens)		
	• state a conclusion, based on experimental data, and explain how evidence gathered supports or refutes an initial idea (e.g., write a conclusion on the effect of dissolved materials on the refraction of light through water)		
	• identify new questions and problems that arise from what was learned (e.g., ask questions about new technologies for improving human vision and about the principles on which these technologies are based)		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning WINTER ELO rows are highlighted
Communication and Teamwork Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	• receive, understand and act on the ideas of others (e.g., act on the suggestions of others in testing and manipulating various lens combinations) • recommend an appropriate way of summarizing and interpreting	❄	
SPECIFIC OUTCOMES FOR ATTITUDES			
Interest in Science	Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., choose to investigate challenging topics; seek information from a variety of sources; express interest in science- and technology-related careers)	❄	
Mutual Respect	Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., show awareness of and respect for the research, care and craftsmanship involved in developing means to enhance human vision)		
Scientific Inquiry	Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., ask questions to clarify meaning or confirm their understanding; take the time to accurately gather evidence and use instruments carefully; consider observations and ideas from a number of sources during investigations and before drawing conclusions)		
Collaboration	Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., choose a variety of strategies, such as active listening, paraphrasing and questioning, in order to understand other points of view; consider alternative ideas and interpretations suggested by members of the group)		
Stewardship	Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., recognize that light can contribute to light pollution)		
Safety	Show concern for safety in planning, carrying out and reviewing activities (e.g., select safe methods in using optical devices; readily alter a procedure to ensure the safety of members of the group)		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning **WINTER ELO rows are highlighted**
	UNIT D: MECHANICAL SYSTEMS ***WINTER/EARLY SPRING**		
	SPECIFIC OUTCOMES FOR SCIENCE, TECHNOLOGY AND SOCIETY		
1. Illustrate the development of science and technology by describing, comparing and interpreting mechanical devices that have been improved over time	• **investigate and provide examples of mechanical devices used in the past to meet particular needs (e.g., describe and interpret devices developed to move water or be moved by water, such as the Persian wheel, Archimedes' screw, mill wheel)**	 	**Explore traditional devices for hunting, building fires, trapping, hide tanning stations, spear throwing, bow and arrow, etc.**
	• illustrate how a common need has been met in different ways over time (e.g., development of different kinds of lifting devices)		
	• illustrate how trial and error and scientific knowledge both play a role in technological development (e.g., development of aircraft)		
2. Analyze machines by describing the structures and functions of the overall system, the subsystems and the component parts	• **analyze a mechanical device, by:** **– describing the overall function of the device** **– describing the contribution of individual components or subsystems to the overall function of the device** **– identifying components that operate as simple machines**		**Use traditional Indigenous mechanical devices such as bow and arrow and compare to a compund bow**
	• identify the source of energy for some familiar mechanical devices		
	• **identify linkages and power transmissions in a mechanical device, and describe their general function (e.g., identify the purpose and general function of belt drives and gear systems within a mechanical device)**		
3. Investigate and describe the transmission of force and energy between parts of a mechanical system	• analyze mechanical devices to determine speed ratios and force ratios		
	• build or modify a model mechanical system to provide for different turning ratios between a driving and driven shaft, or to achieve a given force ratio)		
	• compare theoretical and actual values of force ratios, and propose explanations for discrepancies (e.g., identify frictional forces, and estimate their effect on efficiency)		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning WINTER ELO rows are highlighted
3. Investigate and describe the transmission of force and energy between parts of a mechanical system (continued)	• **identify work input and work output in joules for a simple machine or mechanical system (e.g., use a device to lift a measured mass an identified distance, then calculate the work output)**		
	• describe fluid pressure qualitatively and quantitatively, by: – explaining how forces are transferred in all directions – describing pressure in units of force per unit area		
	• describe how hydraulic pressure can be used to create a mechanical advantage in a simple hydraulic jack (e.g., describe the relationship among force, piston size and distance moved, using different sized syringes linked by tubing)		
	• describe and interpret technologies based on hydraulics and pneumatics (e.g., applications in hydraulic lifts and air-driven tools)		
4. Analyze the social and environmental contexts of science and technology, as they apply to the development of mechanical devices	• evaluate the design and function of a mechanical device in relation to its efficiency and effectiveness, and identify its impacts on humans and the environment		
	• develop and apply a set of criteria for evaluating a given mechanical device, and defend those criteria in terms of relevance to social and environmental needs		
	• illustrate how technological development is influenced by advances in science, and by changes in society and the environment		
SPECIFIC OUTCOMES FOR SKILLS			
Initiating and Planning Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	• identify practical problems (e.g., identify problems related to the effectiveness or efficiency of a mechanical device)		
	• identify questions to investigate arising from practical problems (e.g., "What is the efficiency of this device?")		
	• propose alternative solutions to a practical problem, select one, and develop a plan		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning WINTER ELO rows are highlighted
Initiating and Planning Ask questions about the relationships between and among observable variables, and plan investigations to address those questions (continued)	• formulate operational definitions of major variables and other aspects of their investigations (e.g., define "frictional force" by identifying a method to be used for measuring it)		
	• select appropriate methods and tools for collecting data to solve problems (e.g., develop or apply appropriate methods for measuring speed ratios and force ratios; plan and conduct a search, using a wide variety of electronic sources)		
Performing and Recording Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	• research information relevant to a given problem		
	• select and integrate information from various print and electronic sources or from several parts of the same source		
	• construct and test prototype designs and systems		
	• carry out procedures, controlling the major variables (e.g., ensure that materials to be tested are of the same size and are tested under identical conditions)		
	• organize data, using a format that is appropriate to the task or experiment		
	• use tools and apparatus safely		
Analyzing and Interpreting Analyze qualitative and quantitative data, and develop and assess possible explanations	• identify and correct practical problems in the way a prototype or constructed device functions		
	• evaluate designs and prototypes in terms of function, reliability, safety, efficiency, use of materials and impact on the environment (e.g., test and evaluate the efficiency and reliability of a prototype device to lift a given mass from the floor to a tabletop)		
	• identify and evaluate potential applications of findings (e.g., identify possible applications of a simple machine or mechanical system they have studied)		
Communication and Teamwork Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	• use specific language that is scientifically and technologically appropriate (e.g., use such terms as "system," "subsystem," "component" and "function" in describing a mechanical system)		
	• communicate practical problems, plans and results in a variety of ways, using written and oral language, data tables, graphs, drawings and other means (e.g., describe, using pictures and words, the transmission of a force through a mechanical system)		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning WINTER ELO rows are highlighted
Communication and Teamwork Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results (continued)	• work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise		
SPECIFIC OUTCOMES FOR ATTITUDES			
Interest in Science	Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., investigate examples of mechanical devices in their home and community; ask questions about techniques and materials used; show an interest in related careers and hobbies)		
Mutual Respect	Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., recognize that varied solutions to similar problems have been developed by different cultures throughout history; appreciate that different approaches to problems lead to different solutions, and that each may have merits for particular applications)		
Scientific Inquiry	Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., report the limitations of their designs; continue working on a problem or research project until the best possible solutions or answers are uncovered)		
Collaboration	Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., report the limitations of their designs; continue working on a problem or research project until the best possible solutions or answers are uncovered)		
Stewardship	Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., consider the impacts of their designs on society and the environment; participate in discussions on the appropriateness of a given technology)		
Safety	Show concern for safety in planning, carrying out and reviewing activities (e.g., readily alter a procedure to ensure the safety of members of the group; carefully manipulate materials, using skills learned in class or elsewhere; listen attentively to safety procedures given by the teacher)		

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8

SPRING

All Year	Fall	Winter	Spring
English Language Arts	Connect to themes from Social Studies, Science, Math and Land Based Learning and Cree ways of knowing and being		
Social Studies	From Isolation to Adaptation: Japan	Origins of a Western Worldview: Renaissance Europe	Worldviews in Conflict: The Spanish and the Aztecs
Mathematics	Number Sense	Patterns and Relations	Shape and Space Statistics and Probability
Science	Unit A: Mix and Flow of Matter Unit B: Cells and Systems	Unit C: Light and Optical Systems Unit D: Mechanical Systems	Unit D: Mechanical Systems Unit E: Freshwater and Saltwater Systems

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Spring

HOW THE SPRING CURRICULUM CHARTS ARE ORGANIZED

The Learning Outcomes that follow from **Social Studies** must be taught during the SPRING season. Learning outcomes must be grounded in Nehiyaw Ways of Knowing and Land Based Learning.

These **Social Studies** charts include suggested, although not exhaustive, connections to Nehiyaw Ways of Knowing and Land Based Learning. Throughout the year, teachers will collaborate and generate more/other ideas that will value add to the suggested connections.

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
8.3 WORLDVIEWS IN CONFLICT: THE SPANISH AND THE AZTECS			
GENERAL OUTCOME: Through an examination of Spanish and Aztec societies, students will demonstrate an understanding and appreciation of how intercultural contact affects the worldviews of societies.			
Values and Attitudes			
8.3.1 Appreciate how a society's worldview influences the society's choices, decisions and interactions with other societies (C, I)			
8.3.2 Appreciate how Aztec and Spanish identities and worldviews were affected by intercultural contact (TCC, GC, I)			
8.3.3 Appreciate and recognize how rapid adaptation can radically change a society's beliefs, values and knowledge (TCC, GC)			

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
	Knowledge and Understanding		
8.3.4 Assess, critically, how the Aztecs were affected by the Spanish worldview by exploring and reflecting upon the following questions and issues:	• **What were the key elements of the worldview of the Aztec civilization prior to contact with the Spanish? (TCC, I, CC)**		
	• **How did the Aztec civilization's worldview influence the Aztecs' choices, decisions and customs? (TCC, CC, PADM)**		**Aztec's worldviews were similar to Indigenous worldviews in some ways (eg. turtle island)**
	• **What key elements of Spain's worldview led to the desire to expand the Spanish empire? (TCC, I, PADM)**		
	• **In what ways did factors such as technology and disease contribute to the dominance of the Spanish over the Aztec civilization? (ER, LPP)**		
	• **To what extent were the divergent worldviews of the Spanish and Aztecs factors in the dominance of one nation over the other? (TCC, CC, GC, PADM)**		**History experienced by our Indigneous peoples is repeated with the Aztecs**
	SKILLS AND PROCESSES FOR SOCIAL STUDIES		
	Dimensions of Thinking		
8.S.1 Develop skills of critical thinking and creative thinking:	• analyze the validity of information based on context, bias, source, objectivity, evidence and reliability to broaden understanding of a topic or an issue		
	• evaluate ideas, information and positions from multiple perspectives		
	• demonstrate the ability to analyze local and current affairs		
	• re-evaluate personal opinions to broaden understanding of a topic or an issue		
	generate creative ideas and strategies in individual and group activities - access diverse viewpoints on particular topics by using appropriate technologies		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
8.S.2 Develop skills of historical thinking:	• distinguish cause, effect, sequence and correlation in historical events, including the long- and short-term causal relations		
	• use historical and community resources to organize the sequence of historical events		
	• analyze the historical contexts of key events of a given time period - create a simulation or a model by using technology that permits the making of inferences - identify patterns in organized information		
8.S.3 Develop skills of geographic thinking:	• interpret historical maps to broaden understanding of historical events		
	• use thematic maps to describe cultural and political regions		
	• construct and interpret various maps to broaden understanding of given topics		
	• define geographic problems and issues and pose geographic questions		
	• use geographic tools, such as Geographic Information Systems (GIS) software, to assist in preparing graphs and maps - access and operate multimedia applications and technologies from stand-alone and online sources; e.g., GIS		
8.S.4. Demonstrate skills of decision making and problem solving:	• demonstrate skills of compromise and devise strategies to reach group consensus		
	• propose and apply new ideas and strategies, supported with facts and reasons, to contribute to problem solving and decision making		
	• propose and apply strategies or options to solve problems and deal with issues		

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
8.S.4. Demonstrate skills of decision making and problem solving: (continued)	• participate in and predict outcomes of problem-solving and decision-making scenarios - articulate clearly a plan of action to use technology to solve a problem - identify the appropriate materials and tools to use in order to accomplish a plan of action - evaluate choices and the progress in problem solving, then redefine the plan of action as appropriate - use networks to brainstorm, plan and share ideas with group members		
Social Participation as a Democratic Practice			
8.S.5 Demonstrate skills of cooperation, conflict resolution and consensus building:	• identify and use a variety of strategies to resolve conflicts peacefully and fairly		
	• consider the needs and perspectives of others		
	• demonstrate leadership within groups where appropriate - access, retrieve and share information from electronic sources, such as common files		
8.S.6 Develop age-appropriate behaviour for social involvement as responsible citizens contributing to their community:	• volunteer with organizations, projects and activities that ensure the growth and vitality of their community		
Research for Deliberative Inquiry			
8.S.7 Apply the research process:	• integrate and synthesize concepts to provide an informed point of view on a research question or an issue		
	• develop a position that is supported by information gathered through research		
	• draw conclusions based upon research and evidence		
	• determine how information serves a variety of purposes and that the accuracy or relevance of information may need verification		
	• organize and synthesize researched information		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
8.S.7 Apply the research process: (continued)	• formulate new questions as research progresses		
	• practise the responsible and ethical use of information and technology		
	• include and organize references as part of research - plan and conduct a search, using a wide variety of electronic sources - demonstrate the advanced search skills necessary to limit the number of hits desired for online and offline databases; for example, the use of "and" or "or" between search topics and the choice of appropriate search engines for the topic - develop a process to manage volumes of information that can be made available through electronic sources - evaluate the relevance of electronically accessed information to a particular topic - make connections among related, organized data, and assemble various pieces into a unified message - refine searches to limit sources to a manageable number - analyze and synthesize information to create a product - access and retrieve information through the electronic network		
	Communication		
8.S.8 Demonstrate skills of oral, written and visual literacy:	• communicate in a persuasive and engaging manner through speeches, multimedia presentations and written and oral reports, taking particular audiences and purposes into consideration		
	• use skills of informal debate to persuasively express differing viewpoints regarding an issue		
	• elicit, clarify and respond appropriately to questions, ideas and multiple points of view presented in discussions		
	• offer reasoned comments related to a topic of discussion		
	• listen to others to understand their points of view		

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
8.S.9 Develop skills of media literacy:	• examine techniques used to enhance the authority and authenticity of media messages		
	• examine the values, lifestyles and points of view represented in a media message		
	• analyze the impact of television, the Internet, radio and print media on a particular current affairs issue		

Spring

HOW THE SPRING CURRICULUM CHARTS ARE ORGANIZED

The Learning Outcomes that follow from **Mathematics** must be taught during the SPRING season. Learning outcomes must be grounded in Nehiyaw Ways of Knowing and Land Based Learning.

The content from Land Based Learning, Nehiyaw Ways of Knowing, Social Studies and Science should be applied to the **Mathematics** outcomes. Throughout the year, teachers will collaborate and generate more/other ideas that will value add to the suggested connections.

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
	SHAPE AND SPACE		
General Outcome (Measurement): Use direct and indirect measurement to solve problems.	**1. Develop and apply the Pythagorean theorem to solve problems. [CN, PS, R, T, V] [ICT: P2–3.4]**		
	2. Draw and construct nets for 3-D objects. [C, CN, PS, V]		
	3. Determine the surface area of: [C, CN, PS, R, V] • **right rectangular prisms** • **right triangular prisms** • **right cylinders to solve problems.**		
	4. Develop and apply formulas for determining the volume of right rectangular prisms, right triangular prisms and right cylinders. [C, CN, PS, R, V]		
General Outcome (3-D Objects and 2-D Shapes): Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.	5. Draw and interpret top, front and side views of 3-D objects composed of right rectangular prisms. [C, CN, R, T, V] [ICT: C6–3.4]		
General Outcome (Transformations): Describe and analyze position and motion of objects and shapes.	6. Demonstrate an understanding of the congruence of polygons. [CN, R, V]		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
	STATISTICS AND PROBABILITY		
General Outcome (Data Analysis): Collect, display and analyze data to solve problems.	1. Critique ways in which data is presented in circle graphs, line graphs, bar graphs and pictographs. [C, R, T, V] [ICT: C7–3.1, C7–3.2, F4–3.3]		
General Outcome (Chance and Uncertainty): Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.	**2. Solve problems involving the probability of independent events. [C, CN, PS, T] [ICT: P2–3.4]**		

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Spring

HOW THE SPRING CURRICULUM CHARTS ARE ORGANIZED

The Learning Outcomes that follow from **Science** must be taught during the SPRING season. Learning outcomes must be grounded in Nehiyaw Ways of Knowing and Land Based Learning. Note that all Attitudes and Skills listed at the end of each science unit are important and should be included as part of the unit of study, but are not highlighted as essential because it was inferred that they have been taught in elementary grades or are cross curricular. Science outcomes identified in this chart also cross over from the WINTER season.

These **Science** charts include suggested, although not exhaustive, connections to Nehiyaw Ways of Knowing and Land Based Learning. Throughout the year, teachers will collaborate and generate more/other ideas that will value add to the suggested connections.

Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
	UNIT D: MECHANICAL SYSTEMS ***WINTER/EARLY SPRING**		
	SPECIFIC OUTCOMES FOR SCIENCE, TECHNOLOGY AND SOCIETY		
1. Illustrate the development of science and technology by describing, comparing and interpreting mechanical devices that have been improved over time	• **investigate and provide examples of mechanical devices used in the past to meet particular needs (e.g., describe and interpret devices developed to move water or be moved by water, such as the Persian wheel, Archimedes' screw, mill wheel)**		**Explore traditional devices for hunting, building fires, trapping, hide tanning stations, spear throwing, bow and arrow, etc.**
	• illustrate how a common need has been met in different ways over time (e.g., development of different kinds of lifting devices)		
	• illustrate how trial and error and scientific knowledge both play a role in technological development (e.g., development of aircraft)		
2. Analyze machines by describing the structures and functions of the overall system, the subsystems and the component parts	• **analyze a mechanical device, by:** **– describing the overall function of the device** **– describing the contribution of individual components or subsystems to the overall function of the device** **– identifying components that operate as simple machines**		**Use traditional Indigenous mechanical devices such as bow and arrow and compare to a compund bow**
	• identify the source of energy for some familiar mechanical devices		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
2. Analyze machines by describing the structures and functions of the overall system, the subsystems and the component parts (continued)	• **identify linkages and power transmissions in a mechanical device, and describe their general function (e.g., identify the purpose and general function of belt drives and gear systems within a mechanical device)**		
3. Investigate and describe the transmission of force and energy between parts of a mechanical system	• analyze mechanical devices to determine speed ratios and force ratios		
	• build or modify a model mechanical system to provide for different turning ratios between a driving and driven shaft, or to achieve a given force ratio		
	• compare theoretical and actual values of force ratios, and propose explanations for discrepancies (e.g., identify frictional forces, and estimate their effect on efficiency)		
	• **identify work input and work output in joules for a simple machine or mechanical system (e.g., use a device to lift a measured mass an identified distance, then calculate the work output)**		
	• describe fluid pressure qualitatively and quantitatively, by: – explaining how forces are transferred in all directions – describing pressure in units of force per unit area		
	• describe how hydraulic pressure can be used to create a mechanical advantage in a simple hydraulic jack (e.g., describe the relationship among force, piston size and distance moved, using different sized syringes linked by tubing)		
	• describe and interpret technologies based on hydraulics and pneumatics (e.g., applications in hydraulic lifts and air-driven tools)		
4. Demonstrate and describe processes used in developing, evaluating and improving structures that will meet human needs with a margin of safety	• evaluate the design and function of a mechanical device in relation to its efficiency and effectiveness, and identify its impacts on humans and the environment		
	• develop and apply a set of criteria for evaluating a given mechanical device, and defend those criteria in terms of relevance to social and environmental needs		
	• illustrate how technological development is influenced by advances in science, and by changes in society and the environment		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
	SPECIFIC OUTCOMES FOR SKILLS		
Initiating and Planning Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	• identify practical problems (e.g., identify problems related to the effectiveness or efficiency of a mechanical device)		
	• identify questions to investigate arising from practical problems (e.g., "What is the efficiency of this device?")		
	• propose alternative solutions to a practical problem, select one, and develop a plan		
	• select appropriate methods and tools for collecting data to solve problems (e.g., develop or apply appropriate methods for measuring speed ratios and force ratios; plan and conduct a search, using a wide variety of electronic sources)		
	• formulate operational definitions of major variables and other aspects of their investigations (e.g., define "frictional force" by identifying a method to be used for measuring it)		
Performing and Recording Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	• research information relevant to a given problem		
	• select and integrate information from various print and electronic sources or from several parts of the same source		
	• construct and test prototype designs and systems		
	• carry out procedures, controlling the major variables (e.g., ensure that materials to be tested are of the same size and are tested under identical conditions)		
	• organize data, using a format that is appropriate to the task or experiment		
	• use tools and apparatus safely		
Analyzing and Interpreting Analyze qualitative and quantitative data, and develop and assess possible explanations	• identify and correct practical problems in the way a prototype or constructed device functions		
	• evaluate designs and prototypes in terms of function, reliability, safety, efficiency, use of materials and impact on the environment (e.g., test and evaluate the efficiency and reliability of a prototype device to lift a given mass from the floor to a tabletop)		
	• identify and evaluate potential applications of findings (e.g., identify possible applications of a simple machine or mechanical system they have studied)		

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Big Idea, Major Concepts, GLOs	Specific Learning Outcomes ELOs are bold; Others are *need to know* or *worth being familiar with*	Season	Nehiyaw Ways of Knowing and Land Based Learning SPRING ELO rows are highlighted
Communication and Teamwork Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	• use specific language that is scientifically and technologically appropriate (e.g., use such terms as "system," "subsystem," "component" and "function" in describing a mechanical system) • communicate practical problems, plans and results in a variety of ways, using written and oral language, data tables, graphs, drawings and other means (e.g., describe, using pictures and words, the transmission of a force through a mechanical system) • work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise		
SPECIFIC OUTCOMES FOR ATTITUDES			
Interest in Science	Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., investigate examples of mechanical devices in their home and community; ask questions about techniques and materials used; show an interest in related careers and hobbies)		
Mutual Respect	Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., recognize that varied solutions to similar problems have been developed by different cultures throughout history; appreciate that different approaches to problems lead to different solutions, and that each may have merits for particular applications)		
Scientific Inquiry	Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., report the limitations of their designs; continue working on a problem or research project until the best possible solutions or answers are uncovered)		
Collaboration	Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., accept various roles within a group, including that of leadership; understand that they can disagree with others but still work in a collaborative manner; share the responsibility for difficulties encountered during an activity)		
Stewardship	Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., consider the impacts of their designs on society and the environment; participate in discussions on the appropriateness of a given technology)		

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Safety	Show concern for safety in planning, carrying out and reviewing activities (e.g., readily alter a procedure to ensure the safety of members of the group; carefully manipulate materials, using skills learned in class or elsewhere; listen attentively to safety procedures given by the teacher)		
UNIT E: FRESHWATER AND SALTWATER SYSTEMS			
SPECIFIC OUTCOMES FOR SCIENCE, TECHNOLOGY AND SOCIETY			
1. Describe the distribution and characteristics of water in local and global environments, and identify the significance of water supply and quality to the needs of humans and other living things	• **describe, in general terms, the distribution of water in Alberta, Canada and the world; and interpret information about water characteristics (e.g., identify glaciers, snow, polar icecaps, ground water and oceans as components of Earth's water; interpret graphical information on the availability of potable water)**		**Explore how water is part of renewal in spring. Explore how each community within KTC gets its potable water and challenges related to good water supply. Explore how water changes from winter to spring and the flow of water throughout the KTC communities**
	• recognize that fresh water and salt water contain varying amounts of dissolved materials, particulates and biological components; and interpret information on these component materials		
	• **identify major factors used in determining if water is potable, and describe and demonstrate tests of water quality (e.g., investigate and describe the physical characteristics of a sample of water, such as clarity, salinity and hardness; investigate biological tests)**		**Invite speakers from the local water treatment plant or health departments to demonstrate tests to see if water is potable. Explore traditional Indigenous stories that talk about how horses only drink water that is safe.**
	• **describe, in general terms, methods for generating fresh water from salt water, based on evaporation, distillation and reverse osmosis**		**Explore methods to convert stream, river or lake water into safe, potable water**
2. Investigate and interpret linkages among landforms, water and climate	• describe the processes of erosion and deposition resulting from wave action and water flow, by: – identifying dissolved solids and sediment loads, and identifying sources and endpoints for these materials – describing how waves and tides are generated and how they interact with shorelines		

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2. Investigate and interpret linkages among landforms, water and climate (continued)	• investigate and describe stream characteristics (e.g., describe the slope, flow rate and stream profile characteristics of a model stream on a stream table)		
	• describe processes leading to the development of ocean basins and continental drainage systems (e.g., describe the formation of geological features on the ocean floor, such as continental shelves and trenches)		
	• identify evidence of glacial action, and analyze factors affecting the growth and attrition of glaciers and polar icecaps (e.g., identify factors that affect the size of polar ice sheets and the Columbia Icefield)		
	• describe the movement of ocean currents and its impact on regional climates (e.g., effects of the Gulf Stream, Labrador Current, El Niño, La Niña)		
3. Analyze factors affecting productivity and species distribution in marine and freshwater environments	• investigate life forms found in fresh water and salt water, and identify and interpret examples of adaptations to these environments (e.g., describe and interpret examples of fish and invertebrate species found in a local freshwater environment)		
	• **analyze factors that contribute to the development of adaptations in species found in saltwater and freshwater environments**		**Explore how fish such as whitefish, pickeral and jackfish adapt to their environments. Look at how the salmon adapts from moving from salt water to fresh water.**
	• investigate and interpret examples of seasonal, short-term and long-term change in populations of living things found in aquatic environments (e.g., algal blooms, changes in local freshwater fish populations, cod and salmon stock depletion)		
	• analyze relationships between water quality and living things, and infer the quality of water based on the diversity of life supported by it		
4. Analyze human impacts on aquatic systems; and identify the roles of science and technology in addressing related questions, problems and issues	• **analyze human water uses, and identify the nature and scope of impacts resulting from different uses (e.g., identify pollutants in ground water and surface water systems resulting from domestic and industrial use; analyze the effects of agriculture and forestry practices on stream flow and water quality)**		**Explore how fertilizers contribute to blue algae. Explore how pesticides and insecticides get into the water system and its impact on the quality of the water. Explore impact of human activity (and industry) on local water systems. Identfy if landfill residue seeps into the water supply.**

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4. Analyze human impacts on aquatic systems; and identify the roles of science and technology in addressing related questions, problems and issues (continued)	• **identify current practices and technologies that affect water quality, evaluate environmental costs and benefits, and identify and evaluate alternatives (e.g., research and analyze alternatives for ensuring safe supplies of potable water; research, analyze and debate alternatives for a specific water quality issue, such as the location and design of a landfill, the protection of a natural waterway, the use of secondary and tertiary wastewater treatment, the salinization of soils due to irrigation, the eutrophication of ponds and streams due to excess use of phosphates in fertilizers and detergents, or a proposal to export water resources)**		**Explore the impact of a broken pipeline and how it affects the water quality.**
	• illustrate the role of scientific research in monitoring environments and supporting development of appropriate environmental technologies (e.g., describe a local example of aquatic monitoring, and describe how this research contributes to watershed management)		
	• **provide examples of problems that cannot be solved using scientific and technological knowledge alone (e.g., the need to prevent pollutants from entering aquatic environments, the need to avoid damage from ice sheets and icebergs)**		**Discuss how each student has a responsibility for the quality of their water supply (eg. throwing garbage in the lake, etc.) Students can create a campaign promoting safe water supply and how the community can do their part to protect their water supply - all stewards of the environment.**
SPECIFIC OUTCOMES FOR SKILLS			
Initiating and Planning Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	• identify science-related issues and problems		
	• identify questions to investigate, arising from science-related issues		
	• select appropriate methods and tools for collecting relevant data and information (e.g., plan and conduct a search, using a wide variety of electronic sources)		
	• design an experiment, and identify the major variables (e.g., design an experiment to compare the characteristics of two water samples)		

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Performing and Recording Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	• research information relevant to a given issue		
	• select and integrate information from various print and electronic sources or from several parts of the same source (e.g., summarize information on a river basin)		
	• identify strengths and weaknesses of different methods of collecting and displaying data (e.g., identify strengths and weaknesses of technologies used to monitor and map changes in stream flow)		
Analyzing and Interpreting Analyze qualitative and quantitative data, and develop and assess possible explanations	• apply given criteria for evaluating evidence and sources of information (e.g., assess the authenticity and reliability of electronic sources)		
	• predict the value of a variable, by interpolating or extrapolating from graphical data (e.g., predict future stocks of fish based on long-term data)		
	• interpret patterns and trends in data, and infer and explain relationships among the variables (e.g., relate climates to proximity to oceans and to the characteristics of ocean currents)		
	• identify new questions and problems arising from what was learned (e.g., identify questions, such as: "Can ocean currents be modified?", "Is kelp a viable source of food?", "How would icecap melting change Canadian coastlines?")		
Communication and Teamwork Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	• use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures and results (e.g., use such terms as salinity, currents and basins when describing oceans and their characteristics)		
	• communicate questions, ideas, intentions, plans and results, using lists, notes in point form, sentences, data tables, graphs, drawings, oral language and other means (e.g., create a concept map, linking the different stages of the water cycle; prepare a multimedia presentation on changing climatic conditions and the effects on glaciers, ice sheets and water levels, incorporating graphics, audio, visuals and text gathered from remote sources)		

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Communication and Teamwork Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results (continued)	• evaluate individual and group processes used in planning, problem solving, decision making and completing a task (e.g., discuss advantages and disadvantages of different research methods and sources used to gather information on an ocean basin)		
	• defend a given position on an issue, based on their findings		
SPECIFIC OUTCOMES FOR ATTITUDES			
Interest in Science	Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., express interest in conducting scientific investigations of their own design; take an interest in media reports on environmental issues, and seek out further information from a variety of sources; take an interest in observing and interpreting their environment during personal and group excursions)		
Mutual Respect	Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., show awareness of and respect for the contributions of indigenous peoples to knowledge of the environment)		
Scientific Inquiry	Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., seek data that is accurate and based on appropriate methods of investigation; consider observations and ideas from a number of sources before drawing conclusions)		
Collaboration	Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., share observations and ideas with other members of a group, and consider alternative ideas suggested by other group members; share the responsibility for carrying out decisions)		
Stewardship	Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., consider immediate and long-term consequences of personal and group actions; objectively identify potential conflicts between responding to human wants and needs and protecting the environment)		
Safety	Show concern for safety in planning, carrying out and reviewing activities (e.g., select safe methods and tools for collecting evidence and solving problems; readily alter a procedure to ensure the safety of members of the group)		