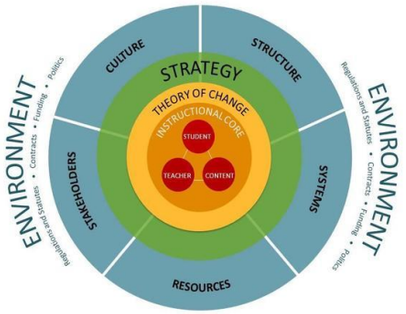
GPPSD Essential Learning Outcomes



Adapted from Tushman and O'Reilly's Congruence Model, 2002

Purpose of the Document

The GPPSD Strategic Plan 2019-2022 for Education focuses on enhancing teacher and leadership professional growth as key drivers of **increased student achievement**" (GPPSD Strategic Plan).

The purpose behind the work in the creation of this document was:

- ✦ To create a document that can be referred to by any administrator or teacher. This document will include the most essential outcomes for students required for the following school year.
- ✦ To ensure equity where all teachers have access to the same determined essential outcomes for all students in the Fall.
- ✦ To ensure efficiency when the new school year begins; all grade level teachers have access to the same essential outcomes from the grade before and for their own grade.
- ✦ To create an element of assurance for parents, teachers, and students.

*Home Education Parents have access to this document as well to ensure that students have access to the essential outcomes required for the school year.

This Document Reinforces:

- ✦ That teachers are not told 'how' to teach, it informs the skills, concepts, and understandings of the identified essential outcomes
- ✦ A foundation for determining essential outcomes is the Program of Studies. The Program of Studies can be accessed here
- ✦ Establishing essential outcomes are determined through the lens of a full-year delivery approach (as opposed to a break in the year)
- ✦ The necessity to vertically align the essential outcomes from previous grade levels to future grade levels

Assurance

This document provides:

- ✦ Assurance that students will have quality learning opportunities that will be guided by Alberta Education mandates and the Alberta Program of Studies in all methods of delivery.
- ✦ Assurance that consistency of program delivery is important to the GPPSD for sound instruction and access to resources.
- ✦ Assurance that students will be receiving ongoing learning feedback and assessment strategies necessary to be successful with essential learning outcomes.
- ✦ Assurance that differentiation will be an essential part of student learning regardless of delivery method and regardless of grade level or course.

What are Essential Outcomes

What Essential Outcomes are	What Essential Outcomes are not
✦Essential outcomes represent the essential understandings that a student must learn to reach high levels of learning	✦Essential outcomes do not represent all that you are going to teach. (Outcomes that are white in the document support essential outcomes).
✦Essential outcomes identify "have to know" versus "nice to know" which informs planning and instruction. 'Have to know' outcomes are those needing to be mastered. Versus 'nice to know' are possibly just those being introduced.	✦Essential outcomes do not omit parts of your curriculum
✦Essential outcomes help us identify which students did not master specific essential outcomes and need additional support	✦Essential outcomes are not for reporting purposes only – they are not to be used word for word in the report card
✦Essential outcomes support common assessment development	✦Essential outcomes do not focus only on PATs
✦Essential outcomes focus on demonstrating knowledge and skills	✦Essential outcomes do not focus on 'experimenting'

Criteria for Selecting Essential Outcomes

Reeves (2002) has offered one set of criteria for use in distinguishing between what is nice and what is essential for students to know:

- ✦ Endurance - long term knowledge
- ✦ Leverage - applicable to many academic disciplines
- ✦ Readiness - prerequisite knowledge for the next level of learning
- ✦ Is regularly assessed on provincial exams

Outcomes meet most criteria in order to be essential.

Adapted from "Simplifying Response to Intervention" (2011)

Legend:

- ✦ Outcomes that are essential are highlighted in this document
- ✦ Outcomes that are left white are supporting outcomes

Printing

- ✦ Entire document can be printed by holding the Control button on your Keyboard and clicking each tab
- ✦ The introductory tabs and the K-6 Documents will print on Legal sized paper, landscape, with a .25" margin on all sides, double sided
- ✦ The Grade 7-9 documents will print on 11 x 17 sized paper, landscape, with a .25" margin on all sides, double sided

GPPSD Assessment

The Guide to Education states:

The assessment of student progress in relation to the outcomes outlined in programs of study is important for the following reasons:

- *The information is essential so that teachers can assist in meeting the learning needs of students.*
- *The information is required for reporting student progress clearly to students and parents.*
- *The information is used in making decisions regarding student placement.*

The assessment of student progress serves as a guide for learning and instruction . Knowledge about each student's current level of achievement is essential for planning learning activities to meet the student's learning needs.

Guidelines

Assessment is necessary to determine where student understanding is and how to plan for instruction. Assessment is also necessary to determine if students are achieving the Provincial Learning Outcomes, are reading at grade level (embedded in the Provincial Learning Outcomes) and have the foundational numeracy skills to be successful in current and subsequent grades.

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K - 3 English Language Arts

Pre-Kindergarten/PreSchool: Teaching practices should be appropriate to children's age and development. Goals and experiences should be adapted to meet student development and learning and provide enough challenge to promote progress and engagement.

Pre-Kindergarten programs focus on language development (emergent to conventional) with a focus on expressive and receptive language (oral language and listening) to support communication. Essential outcomes/goals will be determined by the child's needs and will be determined by the pre-kindergarten teacher in collaboration with a speech language pathologist (and other professionals) and the child's guardian(s). Examples can be but are not limited to the following: self regulation strategies, using eye contact and/or joint attention to meet wants and needs, responding to name, expressing wants and needs through words, gestures and/or a communication device, turn-taking, understanding 1 step commands, vocabulary and concept building through exposure to numbers, nursery rhymes, books and other authentic learning experiences. Reference to The Early Literacy Framework can be made to support goal development and programming. Focused intervention will take place to meet the child's educational needs in accordance with the division's re-entry plan

W - Writing **CaP - Concepts about Print** **PA - Phonological Awareness** **P - Phonics and Word Recognition** **F - Fluency** **V - Vocabulary** **C - Comprehension**

Kindergarten General Outcome 1	Grade 1 General Outcome 1	Grade 2 General Outcome 1	Grade 3 General Outcome 1
Students will listen, speak, read, write, view and represent to explore thoughts, ideas, feelings and experiences.	**General Outcome 1:** **Students will listen, speak, read, write, view and represent to explore thoughts, ideas, feelings and experiences.**	**General Outcome 1:** **Students will listen, speak, read, write, view and represent to explore thoughts, ideas, feelings and experiences.**	**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	**Express ideas and develop understanding**	**Express ideas and develop understanding**	**Express ideas and develop understanding**
share personal experiences prompted by oral, print and other media texts **(oral language)**	share personal experiences that are clearly related to oral, print and other media texts	contribute relevant ideas and information from personal experiences to group language activities	Connect prior knowledge and personal experiences with new ideas and information in oral, print and other media texts **(C)**
talk about ideas, experiences and familiar events	talk with others about something recently learned	talk about how new ideas and information have changed previous understanding	Explain understanding of new concepts in own words
	make observations about activities, experiences with oral, print and other media texts	express or represent ideas and feelings resulting from activities or experiences with oral, print and other media texts	Explore ideas and feelings by asking questions, talking to others and referring to oral, print and other media texts
Experiment with language and forms	**Experiment with language and forms**	**Experiment with language and forms**	**Experiment with language and forms**
talk and represent to explore, express and share stories, ideas a	experiment with different ways of exploring and developing stories, ideas and experiences	use a variety of forms of oral, print and other media texts to organize and give meaning to experiences, ideas and information	Choose appropriate forms of oral, print and other media texts for communicating and sharing ideas with others
Express preferences	**Express preferences**	**Express preferences**	**Express preferences**
talk about favourite oral, print and other media texts	express preferences for a variety of oral, print and other media texts	explain why particular oral, print or other media texts are personal favourites	Choose and share a variety of oral, print and other media texts in areas of particular interest
Set goals	**Set goals**	**Set goals**	**Set goals**
talk about own reading and writing experiences	choose to read and write for and with others	recognize and talk about developing abilities as readers, writers and illustrators	Discuss areas of personal accomplishment as readers, writers and illustrators
1.2 Clarify and Extend			
Consider others' ideas	**Consider others' ideas**	**Consider others' ideas**	**Consider others' ideas**
listen to experiences and feelings shared by others	listen and respond appropriately to experiences and feelings shared by others	connect own ideas and experiences with those shared by others **(C)**	Ask for the ideas and observations of others to explore and clarify personal understanding

Combine ideas	Combine ideas	Combine ideas	Combine ideas
connect related ideas and information **(C)**	group ideas and information into categories determined by an adult **(C)**	record ideas and information in ways that make sense **(C)**	Experiment with arranging and recording ideas and information in a variety of ways
Extend understanding	**Extend understanding**	**Extend understanding**	**Extend understanding**
express interest in new ideas and experiences	ask questions to get additional ideas and information on topics of interest **(C)**	find more information about new ideas and topics	Ask questions to clarify information and ensure understanding **(C)**

Kindergarten General Outcome 2	Grade 1 General Outcome 2	Grade 2 General Outcome 2	Grade 3 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.	**Students will listen, speak, read, write, view and represent to comprehend and respond personally and critically to oral, print and other media texts.**	**Students will listen, speak, read, write, view and represent to comprehend and respond personally and critically to oral, print and other media texts.**	**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 To Comprehend			
Use prior knowledge	**Use prior knowledge**	**Use prior knowledge**	**Use prior knowledge**
connect oral language with print and pictures **(CaP**)	use knowledge of how oral language is used in a variety of contexts to construct and confirm meaning **(PA)**	use knowledge of how oral and written language is used in a variety of contexts to construct and confirm meaning	Share ideas developed through interests, experiences and discussion that are related to new ideas and information **(C)**
understand that stories, information and personal experiences can be recorded in pictures and print and can be listened to, read or viewed **(CaP,C**)	use previous experience and knowledge of oral language to make connections to the meaning of oral, print and other media texts **(C)**	connect personal experiences and knowledge of words, sentences and story patterns from previous reading experiences to construct and confirm meaning **(C)**	Identify the different ways in which oral, print and other media texts, such as stories, textbooks, letters, pictionaries and junior dictionaries, are organized, and use them to construct and confirm meaning
expect print and pictures to have meaning and to be related to each other in print and other media texts **(CaP, C)**	use knowledge of context, pictures, letters, words, sentences, predictable patterns and rhymes in a variety of oral, print and other media texts to construct and confirm meaning **(PA,P)**	use knowledge of the organizational structures of print and stories, such as book covers, titles, pictures and typical beginnings, to construct and confirm meaning **(CaP, C)**	
understand that print and books are organized in predictable ways **(CaP)**	use knowledge of print, pictures, book covers and title pages to construct and confirm meaning **(C)**		
Use comprehension strategies	**Use comprehension strategies**	**Use comprehension strategies**	**Use comprehension strategies**
begin to use language prediction skills when stories are read aloud **(C)**	use language prediction skills to identify unknown words within the context of a sentence **(P)**	use knowledge of oral language to predict words when reading stories and poems **(C)**	Use grammatical knowledge to predict words and sentence structures when reading narrative and expository materials **(C)**
ask questions and make comments during listening and reading activitie**(C)**	use a variety of strategies, such as making predictions, rereading and reading on **(C)** talk about print or other media texts previously read or viewed **(C)**	apply a variety of strategies, such as asking questions, making predictions, recognizing relationships among story elements and drawing conclusions **(C)**	Apply a variety of strategies, such as setting a purpose, confirming predictions, making inferences and drawing conclusions **(C)**
recall events and characters in familiar stories read aloud by others **(C)**	identify the main idea or topic of simple narrative and expository texts **(C)**	identify the main idea or topic and supporting details of simple narrative and expository texts **(C)**	Identify the main idea or topic and supporting details in simple narrative and expository passages **(C)**
read own first name, environmental print and symbols, words that have personal significance and some words in texts **(C)**	identify by sight some familiar words from favourite print texts **(V)**	identify by sight an increasing number of high frequency words and familiar words from favourite books **(V)**	Extend sight vocabulary to include predictable phrases and words related to language use **(F)** *transitioning to more silent reading

Kindergarten	Grade 1	Grade 2	Grade 3
2.1 Use Strategies and Cues To Comprehend			
	identify high frequency words by sight **(V)**	read aloud with fluency, accuracy and expression **(F)**	Read silently with increasing confidence and accuracy **(F)**
	read aloud with some fluency and accuracy, after rehearsal **(F)**	figure out, predict and monitor the meaning of unfamiliar words to make sense of reading, using cues such as pictures, context, phonics, grammatical awareness and background knowledge **(P, C)**	
	self-correct when reading does not make sense, using cues such as pictures, context, phonics, grammatical awareness and background knowledge **(P, C)**		Monitor and confirm meaning by rereading when necessary, and by applying knowledge of pragmatic, semantic, syntactic and graphophonic cueing systems **(C)**
Use textual cues	**Use textual cues**	**Use textual cues**	**Use textual cues**
attend to print cues when stories are read aloud **(CaP**)	preview book cover, pictures and location of text to assist with constructing and confirming meaning **(PA)** **(C)**	preview book covers and titles; look for familiar words, phrases and story patterns to assist with constructing and confirming meaning **(C)**	Use headings, paragraphs, punctuation and quotation marks to assist with constructing and confirming meaning **(CaP,C)**
begin to identify some individual words in texts that have been read aloud	use word boundaries, capital letters, periods, question marks and exclamation marks to assist with constructing and confirming meaning during oral and silent reading **(F, C)**	use predictable phrases and sentence patterns, and attend to capital letters, periods, question marks and exclamation marks to read accurately, fluently and with comprehension during oral and silent reading **(F, C)**	Attend to and use knowledge of capitalization, commas in a series, question marks, exclamation marks and quotation marks to read accurately, fluently and with comprehension during oral and silent reading **(C)**
Use phonics and structural analysis	**Use phonics and structural analysis**	**Use phonics and structural analysis**	**Use phonics and structural analysis**
begin to make connections among sounds, letters, words, pictures and meaning **(PA, P**)	segment and blend sounds in words spoken or heard **(PA,P)**	apply phonic rules and generalizations to read unfamiliar words in context **(P)**	Apply phonic rules and generalizations competently and confidently to read unfamiliar words in context **(P)**
identify and generate rhyming words in oral language **(PA, P**)	use phonic knowledge and skills to read unfamiliar words in context **(P)**	apply knowledge of long and short vowel sounds to read unfamiliar words in context **(P)**	Apply word analysis strategies to segment words into parts or syllables, when reading unfamiliar words in context **(P)**
hear and identify sounds in words **(PA, P**	use analogy to generate and read phonically regular word families **(P)**	use knowledge of word parts, contractions and compound words to read unfamiliar words in context **(P)**	Associate sounds with an increasing number of vowel combinations, consonant blends and digraphs, and letter clusters to read unfamiliar words in context **(P)**
associate sounds with consonants that appear at the beginning of personally significant words **(PA, P**)	associate sounds with letters and some letter clusters **(P)**	associate sounds with some vowel combinations, consonant blends and digraphs, and letter clusters to read unfamiliar words in context **(P)**	
Use references	**Use references**	**Use references**	**Use references**
recite the letters of the alphabet in order **(P)**	use a displayed alphabet as an aid when writing **(P)**	put words in alphabetical order by first letter **(P)**	Put words in alphabetical order by first and second letter
copy scribed words and print texts to assist with writing **(W)**	use personal word books, print texts and environmental print to assist with writing	use pictionaries and personal word books to confirm the spellings or locate the meanings of unfamiliar words in oral, print and other media texts	Use pictionaries, junior dictionaries and spell-check functions to confirm the spellings or locate the meanings of unfamiliar words in oral, print and other media texts
	name and match the upper and lower case forms of letters		

Kindergarten	Grade 1	Grade 2	Grade 3
2.2 Respond to Texts			
Experience various text	**Experience various text**	**Experience various text**	**Experience various text**
participate in shared listening,reading and viewing experiences, using oral, print and other media texts from a variety of cultural traditions and genres, such as picture books, fairy tales, rhymes, stories, photographs, illustrations and video programs	participate in shared listening, reading and viewing experiences, using oral, print and other media texts from a variety of cultural traditions and genres, such as poems, storytelling by elders, pattern books, audiotapes, stories and cartoons	engage in a variety of shared and independent listening, reading and viewing experiences, using oral, print and other media texts from a variety of cultural traditions and genres, such as legends, video programs, puppet plays, songs, riddles and informational texts	Choose a variety of oral, print and other media texts for shared and independent listening, reading and viewing experiences, using texts from a variety of cultural traditions and genres, such as nonfiction, chapter books, illustrated storybooks, drum dances, fables, CDROM programs and plays
listen and view attentively	illustrate and enact stories, rhymes and songs **(C)**	identify favourite kinds of oral, print and other media texts **(C)**	Tell or write about favourite parts of oral, print and other media texts **(W)**
identify favourite stories and books	remember and retell familiar stories and rhymes **(C)**	model own oral, print and other media texts on familiar forms **(C)**	Identify types of literature, such as humour, poetry, adventure and fairy tales, and describe favourites **(C)**
relate aspects of oral, print and other media texts to		respond to mood established in a variety of oral, print	Connect own experiences with the experiences of
Construct meaning from texts	**Construct meaning from texts**	**Construct meaning from texts**	**Construct meaning from texts**
relate aspects of oral, print and other media texts to personal feelings and experiences	relate aspects of stories and characters to personal feelings and experiences **(C)**	connect situations portrayed in oral, print and other media texts to personal and classroom experiences **(C)**	Connect portrayals of characters or situations in oral, print and other media texts to personal and classroom experiences **(C)**
talk about and represent the actions of characters portrayed in oral, print and other media texts **(V,C)**	retell interesting or important aspects of oral, print and other media texts **(C) such as characters**	retell the events portrayed in oral, print and other media texts in sequence	Summarize the main idea of individual oral, print and other media texts **(C)**
talk about experiences similar or related to those in oral, print and other media texts **(C)**	tell or represent the beginning, middle and end of stories **(C)**	suggest alternative endings for oral, print and other media texts **(C)**	Discuss, represent or write about ideas in oral, print and other media texts, and relate them to own ideas and experiences and to other texts **(W, C)**
	tell, represent or write about experiences similar or related to those in oral, print and other media texts **(C)**	discuss, represent or write about interesting or important aspects of oral, print and other media texts **(C)**	Make inferences about a character's actions or feelings **(C)**
	tell what was liked or disliked about oral, print and other media texts **(C)**	express thoughts or feelings related to the events and characters in oral, print and other media texts **(C)**	Express preferences for one character over another **(C)**
Appreciate the artistry of texts	**Appreciate the artistry of texts**	**Appreciate the artistry of texts**	**Appreciate the artistry of texts**
experiment with sounds, words, word patterns, rhymes and rhythms **(PA)**	identify how words can imitate sounds and create special effects **(V)**	identify and use words and sentences that have particular emotional effects	Express feelings related to words, visuals and sound in oral, print and other media texts
	experiment with repetition, rhyme and rhythm to create effects in own oral, print and other media texts **(V)**	identify words in oral, print and other media texts that create clear pictures or impressions of sounds and sights **(V)**	Identify how authors use comparisons, and explain how they create mental images **(C)**
2.3 Understand Forms, Elements and Techniques			
Understand forms and genres	**Understand forms and genres**	**Understand forms and genres**	**Understand forms and genres**
experience a variety of oral, print and other media texts	distinguish differences in the ways various oral, print and other media texts are organized	recognize that ideas and information can be expressed in a variety of oral, print and other media texts	Identify distinguishing features of a variety of oral, print and other media texts **(C)**
	identify various forms of media texts	identify and explain the use of various communication technologies	Discuss ways that visual images convey meaning in print and other media texts **(C)**

Kindergarten	Grade 1	Grade 2	Grade 3
Understand techniques and elements	**Understand techniques and elements**	**Understand techniques and elements**	**Understand techniques and elements**
develop a sense of story through reading, listening and viewing experiences **(C)**	know that stories have beginnings, middles and endings **(C)**	identify main characters, places and events in a variety of oral, print and other media texts **(C)**	Include events, setting and characters when summarizing or retelling oral, print or other media texts **(C)**
identify the main characters in a variety of oral, print and other media text **(C)**	tell what characters do or what happens to them in a variety of oral, print and other media texts **(C)**	identify how pictures, illustrations and special fonts relate to and enhance print and other media texts **(C)**	Describe the main characters in terms of who they are, their actions in the story and their relations with other characters
			Identify ways that messages are enhanced in oral, print and other media texts by the use of specific techniques **(C)**
Experiment with language	**Experiment with language**	**Experiment with language**	**Experiment with language**
appreciate the sounds and rhythms of language in shared language experiences, such as nursery rhymes and personal songs (PA)	demonstrate interest in repetition, rhyme and rhythm in shared language experiences, such as action songs and word play	demonstrate interest in the sounds of words and word combinations in pattern books, poems, songs, and oral and visual presentations	Recognize examples of repeated humour, sound and poetic effects that contribute to audience enjoyment
2.4 Create Original Text			
Generate ideas	**Generate ideas**	**Generate ideas**	**Generate ideas**
contribute ideas and answer questions related to experiences and familiar oral, print and other media texts	generate and contribute ideas for individual or group oral, print and other media texts	use own and respond to others' ideas to create oral, print and other media texts	Experiment with ways of generating and organizing ideas prior to creating oral, print and other media texts
Elaborate on the expression of ideas	**Elaborate on the expression of ideas**	**Elaborate on the expression of ideas**	**Elaborate on the expression of ideas**
listen to and recite short poems, songs and rhymes; and engage in word play and action songs **(PA, F)**	change, extend or complete rhymes, rhythms and sounds in pattern stories, poems, nursery rhymes and other oral, print and other media texts **(W, PA)**	add descriptive words to elaborate on ideas and create particular effects in oral, print and other media texts **(W)**	Use sentence variety to link ideas and create impressions on familiar audiences **(W)**
Structure texts	**Structure texts**	**Structure texts**	**Structure texts**
draw, record or tell about ideas and experiences **(W)**	write, represent and tell brief narratives about own ideas and experiences **(W)**	create narratives that have beginnings, middles and ends; settings; and main characters that perform actions **(W)**	Experiment with a variety of story beginnings to choose ones that best introduce particular stories **(W)**
talk about and explain the meaning of own pictures and print **(C)**	recall and retell or represent favourite stories **(C)**	use traditional story beginnings, patterns and stock characters in own oral, print and other media texts	Add sufficient detail to oral, print and other media texts to tell about setting and character, and to sustain plot **(W)**

Kindergarten	Grade 1	Grade 2	Grade 3
General Outcome 3	**General Outcome 3**	**General Outcome 3**	**General Outcome 3**
Students will listen, speak, read, write, view and represent to manage ideas and information.	**Students will listen, speak, read, write, view and represent to manage ideas and information.**	**Students will listen, speak, read, write, view and represent to manage ideas and information.**	**Students will listen, speak, read, write, view and represent to manage ideas and information.**
3.1 Plan and Focus			
Focus attention	**Focus attention**	**Focus attention**	**Focus attention**
attend to oral, print and other media texts on topics of interest	explore and share own ideas on topics of discussion and study	relate personal knowledge to ideas and information in oral, print and other media texts **(C)**	Use self-questioning to identify information needed to supplement personal knowledge on a topic **(C)**
make statements about topics under discussion (**Oral language, C)**	connect information from oral, print and other media texts to topics of study **(C)**	ask questions to determine the main idea of oral, print and other media texts **(C)**	Identify facts and opinions, main ideas and details in oral, print and other media texts **(C)**
Determine information needs	**Determine information needs**	**Determine information needs**	**Determine information needs**
ask questions to satisfy personal curiosity **(oral language)**	ask and answer questions to satisfy information needs on a specific topic **(C)**	ask questions to focus on particular aspects of topics for own investigations **(C)**	Ask topic-appropriate questions to identify information needs **(C)**
Plan to gather information	**Plan to gather information**	**Plan to gather information**	**Plan to gather information**
suggest ways to gather ideas and information	follow spoken directions for gathering ideas and information	recall and follow directions for accessing and gathering ideas and information	Contribute ideas for developing a class plan to access and gather ideas and information
3.2 Select and Process			
Use a variety of sources	**Use a variety of sources**	**Use a variety of sources**	**Use a variety of sources**
seek information from a variety of sources, such as people at school, at home, in the community, picture books, photographs and videos	find information on a topic, using a variety of sources, such as picture books, concept books, people and field trips	find information on a topic, using a variety of sources, such as simple chapter books, multimedia resources, computers and elders in the community	Find information to answer research questions, using a variety of sources, such as children's magazines, CDROMs, plays, folk tales, songs, stories and the environment
Access information	**Access information**	**Access information**	**Access information**
use illustrations, photographs, video programs, objects and auditory cues, to access information **(CaP)**	use text features, such as illustrations, titles and opening shots in video programs, to access information **(C)**	use text features, such as table of contents, key words, captions and hot links, to access information **(C)**	Use text features, such as titles, pictures, headings, labels, diagrams and dictionary guide words, to access information **(C)**
	use questions to find specific information in oral, print and other media texts	use given categories and specific questions to find information in oral, print and other media texts	Locate answers to questions and extract appropriate and significant information from oral, print and other media texts
	understand that library materials are organized systematically	use the library organizational system to locate information	Use card or electronic catalogues to locate information
Evaluate sources	**Evaluate sources**	**Evaluate sources**	**Evaluate sources**
ask questions to make sense of information	match information to research needs	recognize when information answers the questions asked	Review information to determine its usefulness in answering research questions **(C)**
3.3 Organize, Record and Evaluate			
Organize information	**Organize information**	**Organize information**	**Organize information**
categorize objects and pictures according to visual similarities and differences	identify or categorize information according to sequence, or similarities and differences	categorize related ideas and information, using a variety of strategies, such as finding significant details and sequencing events in logical order	Organize ideas and information, using a variety of strategies, such as clustering, categorizing and sequencing
	list related ideas and information on a topic, and make statements to accompany pictures	produce oral, print and other media texts with introductions, middles and conclusions	Draft ideas and information into short paragraphs, with topic and supporting sentences

Kindergarten	Grade 1	Grade 2	Grade 3
Record information	**Record information**	**Record information**	**Record information**
represent and talk about ideas and information; dictate to a scribe	represent and explain key facts and ideas in own words	record key facts and ideas in own words; identify titles and authors of sources **(W)**	Record facts and ideas using a variety of strategies; list titles and authors of sources **(W)**
Evaluate information	**Evaluate information**	**Evaluate information**	List significant ideas and information from oral, print and other media texts **(W)**
share new learnings with others	recognize and use gathered information to communicate new learning	examine gathered information to decide what information to share or omit	**Evaluate information**
			Determine if gathered information is sufficient to answer research questions
3.4 Share and Review			
Share ideas and information	**Share ideas and information**	**Share ideas and information**	**Share ideas and information**
share ideas and information about topics of interest	share ideas and information from oral, print and other media texts with familiar audiences	share, with familiar audiences, ideas and information on topics	Organize and share ideas and information on topics to engage familiar audiences
	answer questions directly related to texts	clarify information by responding to questions	Use titles, headings and visuals to add interest and highlight important points of presentation
Review research process	**Review research process**	**Review research process**	**Review research process**
share information-gathering experiences	talk about informationgathering experiences by describing what was interesting, valuable or helpful	answer questions, such as "What did I do that worked well?" to reflect on research experiences	Assess the research process, using pre-established criteria

Kindergarten	Grade 1	Grade 2	Grade 3
General Outcome 4	**General Outcome 4**	**General Outcome 4**	**General Outcome 4**
Students will listen, speak, read, write, view and represent to enhance the clarity and artistry of communication.	**Students will listen, speak, read, write, view and represent to enhance the clarity and artistry of communication.**	**Students will listen, speak, read, write, view and represent to enhance the clarity and artistry of communication.**	**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	**Appraise own and others' work**	**Appraise own and others' work**	**Appraise own and others' work**
make statements related to the content of own and others' pictures, stories or talk **(oral language, C)**	ask or respond to questions or comments related to the content of own or others' pictures, stories or talk	identify features that make own or peers' oral, print or other media texts interesting or appealing	Share own oral, print and other media texts with others to identify strengths and ideas for improvement
Revise and edit	**Revise and edit**	**Revise and edit**	**Revise and edit**
retell ideas to clarify meaning in response to questions or comments	rephrase by adding or deleting words, ideas or information to make better sense **(W, C)**	revise words and sentences to improve sequence or add missing information **(W)**	Combine and rearrange existing information to accommodate new ideas and information **(W)**
	check for obvious spelling errors and missing words **(W) (P)**	check for capital letters, punctuation at the end of sentences and errors in spelling **(W)**	Edit for complete and incomplete sentences **(W)**
Enhance legibility	**Enhance legibility**	**Enhance legibility**	**Enhance legibility**
form recognizable letters by holding a pen or pencil in an appropriate and comfortable manner **(W)**	print letters legibly from left to right, using lines on a page as a guide **(W)**	print legibly and efficiently, forming letters of consistent size and shape, and spacing words appropriately **(W)**	Print legibly, and begin to learn proper alignment, shape and slant of cursive writing **(W)**
explore the keyboard, using letters, numbers and the space ba	use appropriate spacing between letters in words and between words in sentences **(W)**	use margins and spacing appropriately **(W)**	Space words and sentences consistently on a line and page **(W)**
	explore and use the keyboard to produce text	explore and use the keyboard to compose and revise text	Use keyboarding skills to compose, revise and print text **(W)**

Kindergarten	Grade 1	Grade 2	Grade 3
			Understand and use vocabulary associated with keyboarding and word processing **(W)**
Expand knowledge of language	**Expand knowledge of language**	**Expand knowledge of language**	**Expand knowledge of language**
explore and experiment with new words and terms associated with topics of interest **(W,P)**	identify and use an increasing number of words and phrases related to personal interests and topics of study **(W)**	develop categories of words associated with experiences and topics of interest **(V)**	Explain relationships among words and concepts associated with topics of study **(V)**
experiment with rhymes and rhythms of language to learn new words **(W,PA)**	experiment with letters, sounds, words and word patterns to learn new words **(W, PA, P)**	use knowledge of word patterns, word combinations and parts of words to learn new words **(W,P, V)**	Experiment with words and word meanings to produce a variety of effects **(V)**
Enhance artistry	**Enhance artistry**	**Enhance artistry**	**Enhance artistry**
experiment with sounds, colours, print and pictures to express ideas and feelings **(W, P)**	use words and pictures to add sensory detail in oral, print and other media texts**(W)**	choose words, language patterns, illustrations or sounds to create a variety of effects in oral, print and other media texts **(W,V)**	Choose words, language patterns, illustrations or sounds to add detail and create desired effects in oral, print and other media texts **(W,V)**
4.2 Attend to Conventions			
Attend to grammar and usage	**Attend to grammar and usage**	**Attend to grammar and usage**	**Attend to grammar and usage**
develop a sense of sentence **(W)**	speak in complete statements, as appropriate **(W)**	write complete sentences, using capital letters and periods **(W)**	Identify a variety of sentence types, and use in own writing **(W)**
	write simple statements, demonstrating awareness of capital letters and periods **(W)**	use connecting words to join related ideas in a sentence **(W)**	Identify correct subject–verb agreement, and use in own writing **(W)**
		identify nouns and verbs, and use in own writing **(W) (V)**	Use adjectives and adverbs to add interest and detail to own writing **(W,V)**
		identify adjectives and adverbs that add interest and detail to stories **(W,V)**	Distinguish between complete and incomplete sentences **(W)**
Attend to spelling	**Attend to spelling**	**Attend to spelling**	**Attend to spelling**
hear and identify dominant sounds in spoken words **(PA, P)**	use knowledge of consonant and short vowel sounds to spell phonically regular one syllable words in own writing **(P)**	use phonic knowledge and skills and visual memory to spell words of more than one syllable, high frequency irregular words and regular plurals in own writing**(P)**	Use phonic knowledge and skills and visual memory, systematically, to spell phonically regular, three-syllable words in own writing **(P)**
demonstrate curiosity about visual features of letters and words with personal significance **(P)**	spell phonically irregular high frequency words in own writing **(P)**	use phonic knowledge and skills and visual memory to attempt spelling of unfamiliar words in own writing **(P)**	Identify generalizations that assist with the spelling of unfamiliar words, including irregular plurals in own writing
connect letters with sounds in words **(W,PA,P)**	use phonic knowledge and skills and visual memory to attempt spelling of words needed for writing **(W,P)**	use the conventional spelling of common words necessary for the efficient communication of ideas in writing **(W)**	Identify frequently misspelled words, and develop strategies for learning to spell them correctly in own writing
print own name, and copy environmental print and words with personal significance **(W)**	know that words have conventionally accepted spellings **(P)**		
Attend to capitalization and punctuation	**Attend to capitalization and punctuation**	**Attend to capitalization and punctuation**	**Attend to capitalization and punctuation**
recognize capital letters and periods in print texts **(W)**	capitalize the first letter of names and the pronoun “I” in own writing	use capital letters for proper nouns and at the beginning of sentences in own writing **(W)**	Use capital letters appropriately in titles of books and stories **(W)**
capitalize first letter of own name **(W)**	identify periods, exclamation marks and question marks when reading, and use them to assist comprehension **(W)**	use periods and question marks, appropriately, as end punctuation in own writing **(W)**	Use exclamation marks, appropriately, as end punctuation in own writing **(W)**
		use commas after greetings and closures in friendly letters and to separate words in a series in own writing **(W)**	Use apostrophes to form common contractions and to show possession in own writing **(W)**
		identify commas and apostrophes when reading, and use them to assist comprehension **(W)**	Identify commas, end punctuation, apostrophes and quotation marks when reading, and use them to assist comprehension **(W)**

Kindergarten	Grade 1	Grade 2	Grade 3
4.3 Present and Share			
Present information	**Present information**	**Present information**	**Present information**
share ideas and information about own drawings and topics of personal interest	present ideas and information to a familiar audience, and respond to questions	present ideas and information by combining illustrations and written texts **(W)**	Present ideas and information on a topic, using a pre-established plan **(W)**
Enhance presentation	**Enhance presentation**	**Enhance presentation**	**Enhance presentation**
use drawings to illustrate ideas and information, and talk about them **(W)**	add such details as labels, captions and pictures to oral, print and other media texts **(W)**	clarify ideas and information presented in own oral, print and other media texts, by responding to questions and comments **(W)**	Use print and nonprint aids to illustrate ideas and information in oral, print and other media texts **(W)**
Use effective oral and visual communication	**Use effective oral and visual communication**	**Use effective oral and visual communication**	**Use effective oral and visual communication**
speak in a clear voice to share ideas and information	speak in a clear voice, with appropriate volume, to an audience	speak in a clear voice, with appropriate volume, at an understandable pace and with expression	Speak or present oral readings with fluency, rhythm, pace, and with appropriate intonation to emphasize key ideas
Demonstrate attentive listening and viewing	**Demonstrate attentive listening and viewing**	**Demonstrate attentive listening and viewing**	**Demonstrate attentive listening and viewing**
follow one or two step instructions	ask questions to clarify information	ask relevant questions to clarify understanding and to have information explained	Rephrase, restate and explain the meaning of oral and visual presentations
make comments that relate to the topic being discussed	be attentive and show interest during listening or viewing activities	show enjoyment and appreciation during listening and viewing activities	Identify and set purposes for listening and viewing
Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**
General Outcome 5	**General Outcome 5**	**General Outcome 5**	**General Outcome 5**
General Outcome 5: **Students will listen, speak, read, write, view and represent to respect, support and collaborate with others.**	**General Outcome 5:** **Students will listen, speak, read, write, view and represent to respect, support and collaborate with others.**	**General Outcome 5:** **Students will listen, speak, read, write, view and represent to respect, support and collaborate with others.**	**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	**Appreciate diversity**	**Appreciate diversity**	**Appreciate diversity**
explore personal experiences and family traditions related to oral, print and other media texts	share personal experiences and family traditions related to oral, print and other media texts	discuss the experiences and traditions of various communities portrayed in oral, print and other media texts	Describe similarities between experiences and traditions encountered in daily life and those portrayed in oral, print and other media texts
		ask for and provide clarification and elaboration of stories and ideas	Retell, paraphrase or explain ideas in oral, print and other media texts **(C)**
Relate texts to culture	**Relate texts to culture**	**Relate texts to culture**	**Relate texts to culture**
explore oral, print and other media texts from various communities	talk about other times, places and people after exploring oral, print and other media texts from various communities	discuss similarities and differences in settings, characters and events in oral, print and other media texts from various communities	Identify and discuss similar ideas or topics within stories from oral, print and other media texts from various communities
Celebrate accomplishments and events	**Celebrate accomplishments and events**	**Celebrate accomplishments and events**	**Celebrate accomplishments and events**
share stories, using rhymes, rhythms, symbols, pictures and drama to celebrate individual and class accomplishments **(PA)**	share ideas and experiences through conversation, puppet plays, dramatic scenes and songs to celebrate individual and class accomplishments	participate in shared language experiences to acknowledge and celebrate individual and class accomplishments	Use appropriate language to acknowledge and celebrate individual and class accomplishments

Kindergarten	Grade 1	Grade 2	Grade 3
Use language to show respect	**Use language to show respect**	**Use language to show respect**	**Use language to show respect**
use appropriate words, phrases and statements with adults and peers when speaking and listening, sharing and taking turns	use appropriate words, phrases and sentences to ask questions, to seek and give assistance, and to take turns	adjust own language use according to the context, purpose and audience	Demonstrate respect for the ideas, abilities and language use of others
5.2 Work Within a Group			
Cooperate with others	**Cooperate with others**	**Cooperate with others**	**Cooperate with others**
participate in class and group activities **(socialization)**	work in partnerships and groups	work in a variety of partnerships and group structures	Work cooperatively with others in small groups on structured tasks
find ways to be helpful to others	help others and ask others for help	identify ways that class members can help each other	Identify others who can provide assistance, and seek their help in specific situations\
Work in groups	**Work in groups**	**Work in groups**	**Work in groups**
ask and answer questions to determine what the class knows about a topic	ask questions and contribute ideas related to class investigations on topics of interest	contribute relevant information and questions to extend group understanding of topics and tasks	Contribute ideas and information on topics to develop a common knowledge base in the group
listen to the ideas of others	take turns sharing ideas and information	stay on topic during class and group discussions	Ask others for their ideas, and express interest in their contributions
Evaluate group process	**Evaluate group process**	**Evaluate group process**	**Evaluate group process**
respond to questions about personal contributions to group process	recognize personal contributions to group process	recognize own and others' contributions to group process	Assess the effectiveness of group process, using pre-established criteria

Pink - is supporting outcome

K - 3 English Mathematics

Pre-Kindergarten: Play-based learning is embedded in teaching practices and pedagogy. All educational goals and experiences are adapted to meet a student's developmental level and to provide enough challenge and stimulation to promote progress and engagement.

Pre-Kindergarten programs focus on language development (emergent to conventional) with an emphasis on expressive and receptive language (oral language and listening) to support learning in the following areas:
communication, cognitive and social emotional development, independence, attention, self-help skills, pre-academic skills, school readiness skills

Essential outcomes/goals will be determined by the child's developmental level and needs and will be determined by the pre-kindergarten teacher in collaboration with a speech language pathologist (and other professionals) and the child's guardian(s). Examples can be but are not limited to the following: self-regulation strategies, use of joint attention and/or social referencing to meet wants and needs, responding to name, expressing wants and needs through words, gestures and/or a communication device, turn-taking, attending at circle time, understanding 1-2 step commands, vocabulary and concept building through exposure to numbers and literacy, nursery rhymes, books and other authentic learning experiences. Reference to The Early Literacy Framework and Preschool Counting Principles can be made to support goal development and programming. Programming and focused intervention will take place to meet the child's educational needs in accordance with the division's re-entry plan.

Kindergarten Number Sense		Grade 1 Number Sense		Grade 2 Number Sense		Grade 3 Number Sense	
Develop Numbers Sense		Develop Number Sense					
Outcomes	**Vocabulary**	**Outcomes**	**Vocabulary**	**Outcomes**	**Vocabulary**	**Outcomes**	**Vocabulary**
1. Say the number sequence 1 to 10 by 1s, starting anywhere from 1 to 10 and from 10 to 1. [C, CN, V]	Count Familiar Arrangements Number Sense Quantity Subitize	1. Say the number sequence 0 to 100 by: 1s forward between any two given numbers; 1s backward from 20 to 0; 2s forward from 0 to 20; 5s and 10s forward from 0 - 100	Conservation of Number Count Counting on Equal Groups Facts Familiar Arrangements Making 10 Mental math Number line Number sense Number sequence Numeral Personal strategy Quantity Refine Skip count Strategy (strategies) Subitize Ten frame	1. Say the number sequence 0 - 100 by: • 2s, 5s and 10s, forward and backward, using starting points that are multiples of 2, 5 and 10 respectively • 10s, using starting points from 1 to 9 • 2s, starting from 1.	Addend Associative property Commutative property Count Counting on Facts Making 10 Mental math Number line Number sense Number sequence Numeral Odd Ordinal numbers Personal Strategy Place value Quantity Refine Skip count Strategy (strategies) Ten frame	1. Say the number sequence 0 to 1000 forward and backward by: • 5s, 10s or 100s, using any starting point • 3s, using starting points that are multiples of 3 • 4s, using starting points that are multiples of 4 • 25s, using starting points that are multiples of 25.	Addend Approximate Array Commutative property Count Denominator Division Equal groups Facts Fraction Making 10 Mental math Multiplication Number line Number Sense Number sequence Numeral Numerator Odd Par of a whole Personal strategy Place value Product Property of zero Proportional Quantity Refine Sharing Skip count
2. Subitize (recognize at a glance) and name familiar arrangements of 1 to 5 objects or dots. [C, CN, ME, V]		2. Subitize (recognize at a glance) and name familiar arrangements of 1 to 10 objects or dots. [C, CN, ME, V]		2. Demonstrate if a number (up to 100) is even or odd		2. Represent and describe numbers to 1000, concretely, pictorially and symbolically.	
3. Relate a numeral, 1 to 10, to its respective quantity. [CN, R, V]		3. Demonstrate an understanding of counting by:		3. Describe order or relative position, using ordinal numbers (up to tenth).		3. Compare and order numbers to 1000.	
4. Represent and describe numbers 2 to 10, concretely and pictorially. [C, CN, ME, R, V]		• indicating that the last number said identifies "how many"		4. Represent and describe numbers to 100, concretely, pictorially and symbolically.		4. Estimate quantities less than 1000, using referents.	
5. Compare quantities 1 to 10, using one-to-one correspondence. [C, CN, V]		• showing that any set has only one count		5. Compare and order numbers up to 100.		5. Illustrate, concretely and pictorially, the meaning of place value for numerals to 1000.	
		• using counting-on		6. Estimate quantities to 100, using referents.		6. Describe and apply mental mathematics strategies for adding two 2-digit numerals.	

Kindergarten		Grade 1 Number Sense	Grade 2 Number Sense	Grade 3 Number Sense	
		Develop Number Sense			
		Outcomes	**Outcomes**	**Outcomes**	**Vocabulary**
		• using parts or equal groups to count sets. [C, CN, ME, R, V]	7. Illustrate, concretely and pictorially, the meaning of place value for numerals to 100.	7. Describe and apply mental mathematics strategies for subtracting two 2-digit numerals.	Strategy (strategies)
		4. Represent and describe numbers to 20, concretely, pictorially and symbolically. [C, CN, V]	8. Demonstrate and explain the effect of adding zero to, or subtracting zero from, any number.	8. Apply estimation strategies to predict sums and differences of two 2-digit numerals in a problem-solving context.	
		5. Compare sets containing up to 20 elements, using: referents; one to one correspndence to solve problems [C,CN, ME, PS, R,V)	9. Demonstrate an understanding of addition (limited to 1- and 2-digit numerals) with answers to 100 and the corresponding subtraction by: • using personal strategies for adding and subtracting with and without the support of manipulatives • creating and solving problems that involve addition and subtraction • using the commutative property of addition (the order in which numbers are added does not affect the sum) • using the associative property of addition (grouping a set of numbers in different ways does not affect the sum) • explaining that the order in which numbers are subtracted may affect the difference.	9. Demonstrate an understanding of addition and subtraction of numbers with answers to 1000 (limited to 1-, 2- and 3-digit numerals), concretely, pictorially and symbolically, by: • using personal strategies for adding and subtracting with and without the support of manipulatives • creating and solving problems in context that involve addition and subtraction of numbers.	
		6. Estimate quantities to 20 by using referents. [C, CN, ME, PS, R, V]	10. Apply mental mathematics strategies for basic addition facts and related subtraction facts to 18. • using doubles • making 10 • one more, one less • two more, two less • building on a known double • thinking addition for subtraction	10. Apply mental mathematics strategies and number properties in order to understand and recall basic addition facts and related subtraction facts to 18.	
		7. Demonstrate an understanding of		11. Demonstrate an	
		8. Identify the number, up to 20, that is: one more, two more, one less, • two less than a given number. [C, CN, ME, R, V]			

Kindergarten		Grade 1 Number Sense	Grade 2 Number Sense		Grade 3 Number Sense
		Develop Number Sense			
		Outcomes	**Outcomes**		**Outcomes**
		9. Demonstrate an understanding of addition of numbers with answers to 20 and their corresponding subtraction facts, concretely, pictorially and symbolically, by: • using familiar mathematical language to describe additive and subtractive actions • creating and solving problems in context that involve addition and subtraction • modelling addition and subtraction, using a variety of concrete and visual representations, and recording the process symbolically. [C, CN, ME, PS, R, V]			12. Demonstrate an understanding of division (limited to division related to multiplication facts up to 5 × 5) by: • representing and explaining division using equal sharing and equal grouping • creating and solving problems in context that involve equal sharing and equal grouping • modelling equal sharing and equal grouping using concrete and visual representations, and recording the process symbolically • relating division to repeated subtraction • relating division to multiplication.
		10. Describe and use mental mathematics strategies for basic addition facts and related subtraction facts to 18. [C, CN, ME, PS, R, V]			13. Demonstrate an understanding of fractions by: • explaining that a fraction represents a part of a whole • describing situations in which fractions are used • comparing fractions of the same whole that have like denominators.

Kindergarten Patterns and Relations		Grade 1 Patterns and Relations		Grade 2 Patterns and Relations		Grade 3 Paterns and Relations	
General Outcome (Patterns): Use patterns to describe the world and to solve problems.				**Outcomes**	**Vocabulary**	**Outcomes**	**Vocabulary**
1. Demonstrate an understanding of repeating patterns (two or three elements) by: • identifying • reproducing • extending • creating patterns using manipulatives, sounds and actions. [C, CN, PS, V] [ICT: P2–1.1]	Element Extend Pattern Reproduce	1. Demonstrate an understanding of repeating patterns (two to four elements) by: • describing • reproducing • extending • creating patterns using manipulatives, diagrams, sounds and actions. [C, PS, R, V] [ICT: P2–1.1]	Algebraic expression Core Element Equality (equalities) Equation Expression Extend Imbalance Pictorial Pattern Reproduce Symbol Variable(s)	1. Demonstrate an understanding of repeating patterns (three to five elements) by: • describing • extending • comparing • creating patterns using manipulatives, diagrams, sounds and actions.	Algebraic expression Core Element Equality (equalities) Equation Expression Extend Indreasing patterns Inequality Non-numerical patterns Pictorial Pattern Pattern rule Reproduce Symbol Variable	1. Demonstrate an understanding of increasing patterns by: • describing • extending • comparing • creating numerical (numbers to 1000) and non-numerical patterns using manipulatives, diagrams, sounds and actions.	Algebraic expression Element Equation Expression Extend Increasing pattern Non-numerical pattern Numerical pattern Pictorial Pattern Pattern rule Symbol Variable Venn diagram
2. Sort a set of objects based on a single attribute, and explain the sorting rule. [C, CN, PS, R, V]		2. Translate repeating patterns from one representation to another. [C, CN, R, V]		2. Demonstrate an understanding of increasing patterns by: • describing • reproducing • extending • creating numerical (numbers to 100) and non-numerical patterns using manipulatives, diagrams, sounds and actions.		2. Demonstrate an understanding of decreasing patterns by: • describing • extending • comparing • creating numerical (numbers to 1000) and non-numerical patterns using manipulatives, diagrams, sounds and actions.	
		3. Sort objects, using one attribute, and explain the sorting rule. [C, CN, R, V]		3. Sort a set of objects, using two attributes, and explain the sorting rule.		3. Sort objects or numbers, using one or more than one attribute.	
		General Outcome (Variables and Equations): Represent algebraic expressions in multiple ways		4. Demonstrate and explain the meaning of equality and inequality, concretely and pictorially.		4. Solve one-step addition and subtraction equations involving a symbol to represent an unknown number.	
		4. Describe equality as a balance and inequality as an imbalance, concretely and pictorially (0 to 20). [C, CN, R, V]		5. Record equalities and inequalities symbolically, using the equal symbol or the not equal symbol.			
		5. Record equalities, using the equal symbol. [C, CN, PS, V]					

Kindergarten Shape and Space		Grade 1 Shape and Space		Grade 2 Shape and Space		Grade 3 Shape and Space	
Measurement		**Measurement**		**Measurement**		**Measurement**	
1. Use direct comparison to compare two objects based on a single attribute, such as length (height), mass (weight) and volume (capacity). [C, CN, PS, R, V]	Build (ing) Capacity Height Direct measurement Indirect measurement Mass 3D Object Orientation 2D shape Volue	General Outcome Use direct and indirect measurement to solve problems.	Area Build (ing) Capacity Composite 2D shape Cover (ing) Days Height Indirect measurement Direct measurement Meter 3D object 2D shape volume	1. Relate the number of days to a week and the number of months to a year in a problem-solving context.	Build (ing) Calendar Circle Concrete graph Cone Cube Cylinder Days Dimension Direct measurement Distance around Faces Height Indirect measurement Mass Month Non-standard measurement 3D object Orientation Pyramid Rectangle 2D shape Sphere Square Triangle Volume	1. Relate the passage of time to common activities, using nonstandard and standard units (minutes, hours, days, weeks, months, years).	Calendar Centimetre Come Cube Bylinder Days Dimension Direct measurement Edge Faces Gram (g) Height Hexagon Hour Indirect measurement Irregular polygon Irregular shape Kilogram Line segment Mass Meter Minute Month Non-standard measurement 3D object Octagon Orientation Pentagon Perimeter Pyramid quadrilateral Regular polygon
3-D Objects and 2-D Shapes		1. Demonstrate an understanding of measurement as a process of comparing by: • identifying attributes that can be compared • ordering objects • making statements of comparison • filling, covering or matching. [C, CN, PS, R, V]		2. Relate the size of a unit of measure to the number of units (limited to nonstandard units) used to measure length and mass (weight).		2. Relate the number of seconds to a minute, the number of minutes to an hour and the number of days to a month in a problem-solving context.	
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.		**3-D Objects and 2-D Shapes**		3. Compare and order objects by length, height, distance around and mass (weight), using nonstandard units, and make statements of comparison.		3. Demonstrate an understanding of measuring length (cm, m) by:	
Specific Outcomes		2. Sort 3-D objects and 2-D shapes, using one attribute, and explain the sorting rule. [C, CN, R, V]		4. Measure length to the nearest nonstandard unit by: • using multiple copies of a unit • using a single copy of a unit (iteration process).		• selecting and justifying referents for the units cm and m • modelling and describing the relationship between the units cm and m • estimating length, using referents	
		3. Replicate composite 2-D shapes and 3-D objects. [CN, PS, V]		5. Demonstrate that changing the orientation of an object does not alter the measurements of its attributes.		• measuring and recording length, width and height.	

		4. Compare 2-D shapes to parts of 3-D objects in the environment. [C, CN, V]				4. Demonstrate an understanding of measuring mass (g, kg) by: • selecting and justifying referents for the units g and kg • modelling and describing the relationship between the units g and kg • estimating mass, using referents • measuring and recording mass.	Regular shape Second Segment 2D shape Skeleton Sphere Triangle Vertex Weeks
Kindergarten **Number Sense**		**Grade 1** **Number Sense**		**Grade 2** **Shape and Space**		**Grade 3** **Shape and Space**	
Develop Numbers Sense		**Develop Number Sense**					
		Outcomes		**3-D Objects and 2-D Shapes**		**Measurement**	
				6. Sort 2-D shapes and 3-D objects, using two attributes, and explain the sorting rule.		5. Demonstrate an understanding of perimeter of regular and irregular shapes by: • estimating perimeter, using referents for cm or m • measuring and recording perimeter (cm, m)	
				7. Describe, compare and construct 3-D objects, including: • cubes • spheres • cones • cylinders • pyramids.			
				8. Describe, compare and construct 2-D shapes, including: • triangles • squares • rectangles • circles.		• constructing different shapes for a given perimeter (cm, m) to demonstrate that many shapes are possible for a perimeter.	
				9. Identify 2-D shapes as parts of 3-D objects in the environment.			
						3-D Objects and 2-D Shapes	
						6. Describe 3-D objects according to the shape of the faces and the number of edges and vertices.	
						7. Sort regular and irregular polygons, including: • triangles • quadrilaterals • pentagons • hexagons • octagons according to the number of sides.	

Kindergarten Statistics and Probability		Grade 1 Statistics and Probability		Grade 2 Statistics and Probability		Grade 3 Statistics and Probability	
			Vocabulary	Data Analysis	Vocabulary	Data Analysis	Vocabulary
			Filling	1. Gather and record data about self and others to answer questions.	Collect Concrete graph Data List	1. Collect first-hand data and organize it using: • tally marks	Axes Bar Graph collect Data
				2. Construct and interpret concrete graphs and pictographs to solve problems.	Pictogram	• line plots	First hand data Linear equation
						• charts • lists to answer questions.	List
						2. Construct, label and interpret bar graphs to solve problems.	

Kindergarten Vocabulary found in multiple strands		Grade 1 Vocabulary found in multiple strands		Grade 2 Vocabulary found in multiple strands		Grade 3 Vocabulary found in multiple strands	
analyze		addition	relationship	addition	model	addition	length
attribute		analyze	repeating	analyze	more than	analyze	less
compare		apply	represent	apply	multiple	apply	mass
concrete		attribute	set	attribute	number	attribute	match
create		compare	solve	compare	one to one correspondence	classify	measure/measurement
demonstrate		concrete	sort	concrete	order	compare	model
describe		create	sorting rule	create	prediction	concrete	more than
difference		demonstrate	subtraction	demonstrate	relate	create	multiple
explain		describe	sum	describe	record	decreasing	number
hundred chart		develop	symbolic	develop	referent	demonstrate	one to one correspondence
length		diagram	vertical	diagram	relationship	describe	order
less		difference	year	difference	repeating	develop	relate
mass		equation		digit	represent	diagonal	record
match		estimate		equation	set	diagram	referent
measure/measurement		explain		estimate	solve	difference	relationship
more than		identify		even	sort	digit	repeating
number		increasing		explain	sorting rule	equal sharing	represent
one to one correspondence		length		formula	standard	equation	set
relate		less		grouping	subtraction	equivalent	solve
relationship		mass		horizontal	sum	estimate	sort
repeating		match		hundred chart	symbolic	even	sorting rule
represent		measure/measurement		identify	vertical	explain	standard
set		model		illustrate	year	grouping	subtraction
solve		more than		increasing pattern		horizontal	sum
sort		number		interpret		hundred chart	symbolic
sorting rule		one to one correspondence		justify		identify	tally marks
		order		length		illustrate	vertical
		prediction		less		increasing	whole
		relate		mass		interpret	whole numbers
		record		match		justify	year
		referent		measure/measurement		label	

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GR 4 - 6 English Language Arts

Grade 4	Grade 5	Grade 6
General Outcome 1	**General Outcome 1**	**General Outcome 1**
Students will listen, speak, read, write, view and represent to explore thoughts, ideas, feelings and experiences.	**Students will listen, speak, read, write, view and represent to explore thoughts, ideas, feelings and experiences.**	**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	**Express ideas and develop understanding**	**Express ideas and develop understanding**
Compare new ideas, information and experiences to prior knowledge and experiences	Use appropriate prior knowledge and experiences to make sense of new ideas and information	Use prior experiences with oral, print and other media texts to choose new texts that meet learning needs and interests
Ask questions, paraphrase and discuss to explore ideas and understand new concepts	Read, write, represent and talk to explore personal understandings of new ideas and information	Read, write, represent and talk to explore and explain connections between prior knowledge and new information in oral, print and other media texts
Share personal responses to explore and develop understanding of oral, print and other media texts	Use own experiences as a basis for exploring and expressing opinions and understanding	Engage in exploratory communication to share personal responses and develop own interpretations
Experiment with language and forms	**Experiment with language and forms**	**Experiment with language and forms**
Discuss and compare the ways similar topics are developed in different forms of oral, print and other media texts	Select from provided forms of oral, print and other media texts those that best organize ideas and information and develop understanding of topics	Experiment with a variety of forms of oral, print and other media texts to discover those best suited for exploring, organizing and sharing ideas, information and experiences
Express preferences	**Express preferences**	**Express preferences**
Select preferred forms from a variety of oral, print and other media texts	Select and explain preferences for particular forms of oral, print and other media texts	Assess a variety of oral, print and other media texts, and discuss preferences for particular forms
Set goals	**Set goals**	**Set goals**
Identify areas of personal accomplishment and areas for enhancement in language learning and use	Reflect on areas of personal accomplishment, and set personal goals to improve language learning and use	Assess personal language use, and revise personal goals to enhance language learning and use

Legend

Essential Outcome

1.2 Clarify and Extend		
Consider others' ideas	**Consider others' ideas**	**Consider others' ideas**
Identify other perspectives by exploring a variety of ideas, opinions, responses and oral, print and other media texts	Seek the viewpoints of others to build on personal responses and understanding	Select from the ideas and observations of others to expand personal understanding
Combine ideas	**Combine ideas**	**Combine ideas**
Use talk, notes, personal writing and representing to record and reflect on ideas, information and experiences	Use talk, notes, personal writing and representing to explore relationships among own ideas and experiences, those of others and those encountered in oral, print and other media texts	Use talk, notes, personal writing and representing, together with texts and the ideas of others, to clarify and shape understanding
Extend understanding	**Extend understanding**	**Extend understanding**
Explore ways to find additional ideas and information to extend understanding	Search for further ideas and information from others and from oral, print and other media texts to extend understanding	Evaluate the usefulness of new ideas, techniques and texts in terms of present understanding
Grade 4	**Grade 5**	**Grade 6**
General Outcome 2	**General Outcome 2**	**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.	**Students will listen, speak, read, write, view and represent to comprehend and respond personally and critically to oral, print and other media texts.**	**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 prior knowledge**	**Use prior knowledge**
Use ideas and concepts, developed through personal interests, experiences and discussion, to understand new ideas and information	Describe ways that personal experiences and prior knowledge contribute to understanding new ideas and information	Combine personal experiences and the knowledge and skills gained through previous experiences with oral, print and other media texts to understand new ideas and information
Explain how the organizational structure of oral, print and other media texts can assist in constructing and confirming meaning	Use knowledge of organizational structures, such as tables of contents, indices, topic sentences and headings, to locate information and to construct and confirm meaning	Apply knowledge of organizational structures of oral, print and other media texts to assist with constructing and confirming meaning
Use comprehension strategies	**Use comprehension strategies**	**Use comprehension strategies**
Preview sections of print texts to identify the general nature of the information and to set appropriate purpose and reading rate	Preview sections of print texts, and apply reading rate and strategies appropriate for the purpose, content and format of the texts	Identify, and explain in own words, the interrelationship of the main ideas and supporting details

Grade 4	Grade 5	Grade 6
Comprehend new ideas and information by responding personally and discussing ideas with others	Comprehend new ideas and information by responding personally, taking notes and discussing ideas with others	Preview the content and structure of subject area texts, and use this information to set a purpose, rate and strategy for reading
Extend sight vocabulary to include words frequently used in other subject areas	Use the meanings of familiar words to predict the meanings of unfamiliar words in context	Use definitions provided in context to identify the meanings of unfamiliar words
Monitor understanding by confirming or revising inferences and predictions based on information in text	Monitor understanding by comparing personal knowledge and experiences with information on the same topic from a variety of sources	Monitor understanding by evaluating new ideas and information in relation to known ideas and information
Use textual cues	**Use textual cues**	**Use textual cues**
Use text features, such as headings, subheadings and margin organizers, to enhance understanding of ideas and information	Use text features, such as maps, diagrams, special fonts and graphics, that highlight important concepts to enhance understanding of ideas and information	Use text features, such as charts, graphs and dictionaries, to enhance understanding of ideas and information
Distinguish differences in the structural elements of texts, such as letters and storybooks, to access and comprehend ideas and information	Identify and use the structural elements of texts, such as letters, brochures, glossaries and encyclopedias, to access and comprehend ideas and information	Identify and use the structural elements of texts, such as magazines, newspapers, newscasts and news features, to access and comprehend ideas and information
Use phonics and structural analysis	**Use phonics and structural analysis**	**Use phonics and structural analysis**
Identify and know the meaning of some frequently used prefixes and suffixes	Identify and know by sight the meaning of high frequency prefixes and suffixes to read unfamiliar, multisyllable words in context	Use the meanings of prefixes and suffixes to predict the meanings of unfamiliar words in context
Apply knowledge of root words, compound words, syllabication, contractions and complex word families to read unfamiliar words in context	Integrate knowledge of phonics, sight vocabulary and structural analysis with knowledge of language and context clues to read unfamiliar words in context	Integrate and apply knowledge of phonics, sight vocabulary, language and context clues, and structural analysis to read unfamiliar words in texts of increasing length and complexity
Integrate knowledge of phonics and sight vocabulary with knowledge of language and context clues to read unfamiliar words in context	**Use references**	**Use references**
Use references	Find words in digital dictionaries and glossaries to confirm the spellings or locate the meanings, by using knowledge of phonics and structural analysis,	Choose the most appropriate reference to confirm the spellings or locate the meanings of unfamiliar words in oral, print and other media texts
Use alphabetical order by first and second letter to locate information in reference materials		

Grade 4	Grade 5	Grade 6
Use junior dictionaries, spell-check functions and electronic dictionaries to confirm the spellings or locate the meanings of unfamiliar words in oral, print and other media texts		
2.2 Respond to Texts		
Experience various texts	**Experience various text**	**Experience various text**
Experience oral, print and other media texts from a variety of cultural traditions and genres, such as personal narratives, plays, novels, video programs, adventure stories, folk tales, informational texts, mysteries, poetry and CDROM programs	Experience oral, print and other media texts from a variety of cultural traditions and genres, such as historical fiction, myths, biographies, poetry, news reports and guest speakers	Experience oral, print and other media texts from a variety of cultural traditions and genres, such as autobiographies, travelogues, comics, short films, myths, legends and dramatic performances
Identify and discuss favourite authors, topics and kinds of oral, print and other media texts	Express points of view about oral, print and other media texts	Explain own point of view about oral, print and other media texts
Discuss a variety of oral, print or other media texts by the same author, illustrator, storyteller or filmmaker	Make connections between fictional texts and historical events	Make connections between own life and characters and ideas in oral, print and other media texts
Retell events of stories in another form or medium	Describe and discuss new places, times, characters and events encountered in oral, print and other media texts	Discuss common topics or themes in a variety of oral, print and other media texts
Make general evaluative statements about oral, print and other media texts	Write or represent the meaning of texts in different forms	Discuss the author's, illustrator's, storyteller's or filmmaker's intention or purpose
Construct meaning from texts	**Construct meaning from texts**	**Construct meaning from texts**
Connect the thoughts and actions of characters portrayed in oral, print and other media texts to personal and classroom experiences	Compare characters and situations portrayed in oral, print and other media texts to those encountered in the classroom and community	Observe and discuss aspects of human nature revealed in oral, print and other media texts, and relate them to those encountered in the community
Identify the main events in oral, print and other media texts; explain their causes, and describe how they influence subsequent events	Describe characters' qualities based on what they say and do and how they are described in oral, print and other media texts	Summarize oral, print or other media texts, indicating the connections among events, characters and settings
Compare similar oral, print and other media texts and express preferences, using evidence from personal experiences and the texts	Describe and discuss the influence of setting on the characters and events	Identify or infer reasons for a character's actions or feelings
Develop own opinions based on ideas encountered in oral, print and other media texts	Support own interpretations of oral, print and other media texts, using evidence from personal experiences and the texts	Make judgements and inferences related to events, characters, setting and main ideas of oral, print and other media texts

Grade 4	Grade 5	Grade 6
	Retell or represent stories from the points of view of different characters	Comment on the credibility of characters and events in oral, print and other media texts, using evidence from personal experiences and the text
Appreciate the artistry of texts	**Appreciate the artistry of texts**	**Appreciate the artistry of texts**
Explain how onomatopoeia and alliteration are used to create mental images	Explain how simile and hyperbole are used to create mood and mental images	Explain how metaphor, personification and synecdoche are used to create mood and mental images
Explain how language and visuals work together to communicate meaning and enhance effect	Alter sentences and word choices to enhance meaning and to create mood and special effects	Experiment with sentence patterns, imagery and exaggeration to create mood and mental images
		Discuss how detail is used to enhance character, setting, action and mood in oral, print and other media texts
2.3 Understand Forms, Elements and Techniques		
Understand forms and genres	**Understand forms and genres**	**Understand forms and genres**
Describe and compare the main characteristics of a variety of oral, print and other media texts	Identify and discuss similarities and differences among a variety of forms of oral, print and other media texts	Identify key characteristics of a variety of forms or genres of oral, print and other media texts
Identify various ways that information can be recorded and presented visually	Identify the main characteristics of familiar media and media texts	Discuss the differences between print and other media versions of the same text
Understand techniques and elements	**Understand techniques and elements**	**Understand techniques and elements**
Identify and explain connections among events, setting and main characters in oral, print and other media texts	Identify the main problem or conflict in oral, print and other media texts, and explain how it is resolved	Discuss the connections among plot, setting and characters in oral, print and other media texts
Identify the speaker or narrator of oral, print or other media texts	Identify and discuss the main character's point of view and motivation	Identify first and third person narration, and discuss preferences with reference to familiar texts
Identify how specific techniques are used to affect viewer perceptions in media texts	Identify examples of apt word choice and imagery that create particular effects	Explore techniques, such as visual imagery, sound, flashback and voice inflection, in oral, print and other media texts
	Identify sections or elements in print or other media texts, such as shots in films or sections in magazines	Identify strategies that presenters use in media texts to influence audiences

Grade 4	Grade 5	Grade 6
Experiment with language	**Experiment with language**	**Experiment with language**
Recognize how words and word combinations, such as word play, repetition and rhyme, influence or convey meaning	Experiment with words and sentence patterns to create word pictures; identify how imagery and figurative language, such as simile and exaggeration, convey meaning	Alter words, forms and sentence patterns to create new versions of texts for a variety of purposes; explain how imagery and figurative language, such as personification and alliteration, clarify and enhance meaning
2.4 Create Original Text		
Generate ideas	**Generate ideas**	**Generate ideas**
Use a variety of strategies for generating and organizing ideas and experiences in oral, print and other media texts	Use texts from listening, reading and viewing experiences as models for producing own oral, print and other media texts	Choose life themes encountered in reading, listening and viewing activities, and in own experiences, for creating oral, print and other media texts
Elaborate on the expression of ideas	**Elaborate on the expression of ideas**	**Elaborate on the expression of ideas**
Select and use visuals that enhance meaning of oral, print and other media texts	Experiment with modeled forms of oral, print and other media texts to suit particular audiences and purposes	Use literary devices, such as imagery and figurative language, to create particular effects
Structure texts	**Structure texts**	**Structure texts**
Produce oral, print and other media texts that follow a logical sequence, and demonstrate clear relationships between character and plot	Use structures encountered in texts to organize and present ideas in own oral, print and other media texts	Determine purpose and audience needs to choose forms, and organize ideas and details in oral, print and other media texts
Produce narratives that describe experiences and reflect personal responses	Use own experience as a starting point and source of information for fictional oral, print and other media texts	Express the same ideas in different forms and genres; compare and explain the effectiveness of each for audience and purpose
Grade 4	**Grade 5**	**Grade 6**
General Outcome 3	**General Outcome 3**	**General Outcome 3**
Students will listen, speak, read, write, view and represent to manage ideas and information.	**Students will listen, speak, read, write, view and represent to manage ideas and information.**	**Students will listen, speak, read, write, view and represent to manage ideas and information.**
3.1 Plan and Focus		
Focus attention	**Focus attention**	**Focus attention**
Use organizational patterns of expository texts to understand ideas and information	Summarize important ideas in oral, print and other media texts and express opinions about them	Distinguish among facts, supported inferences and opinions

Grade 4	Grade 5	Grade 6
Focus topics appropriately for particular audiences	Combine personal knowledge of topics with understanding of audience needs to focus topics for investigation	Use note-taking or representing to assist with understanding ideas and information, and focusing topics for investigation
Determine information needs	**Determine information needs**	**Determine information needs**
Ask relevant questions, and respond to questions related to a particular topic	Identify categories of information related to particular topics, and ask questions related to each category	Decide on and select the information needed to support a point of view
Plan to gather information	**Plan to gather information**	**Plan to gather information**
Develop and follow a class plan for accessing and gathering ideas and information	Develop and follow own plan for gathering and recording ideas and information	Develop and follow own plan for accessing and gathering ideas and information, considering guidelines for time and length of investigation and presentation
3.2 Select and Process		
Use a variety of sources	**Use a variety of sources**	**Use a variety of sources**
Locate information to answer research questions, using a variety of sources, such as maps, atlases, charts, dictionaries, school libraries, video programs, elders in the community and field trips	Locate information to answer research questions, using a variety of sources, such as newspapers, encyclopedias, CDROMs, a series by the same writer, scripts, diaries, autobiographies, interviews and oral traditions	Locate information to answer research questions, using a variety of sources, such as printed texts, bulletin boards, biographies, art, music, community resource people, CDROMs and the Internet
Access information	**Access information**	**Access information**
Use a variety of tools, such as indices, legends, charts, glossaries, typographical features and dictionary guide words, to access information	Use a variety of tools, such as chapter headings, glossaries and encyclopedia guide words, to access information	Use a variety of tools, such as bibliographies, thesauri, electronic searches and technology, to access information
Identify information sources that inform, persuade or entertain, and use such sources appropriately	Skim, scan and listen for key words and phrases	Skim, scan and read closely to gather information
Evaluate sources	**Evaluate sources**	**Evaluate sources**
Recall important points, and make and revise predictions regarding upcoming information	Determine the usefulness and relevance of information for research purpose and focus, using pre-established criteria	Evaluate the congruency between gathered information and research purpose and focus, using pre-established criteria
3.3 Organize, Record and Evaluate		
Organize information	**Organize information**	**Organize information**
Organize ideas and information, using appropriate categories, chronological order, cause and effect, or posing and answering questions	Use clear organizational structures, such as chronological order, and cause and effect, to link ideas and information and to assist audience understanding	Organize ideas and information using a variety of strategies and techniques, such as comparing and contrasting, and classifying and sorting according to subtopics and sequence

Grade 4	Grade 5	Grade 6
Record ideas and information that are on topic	Organize ideas and information to emphasize key points for the audience	Organize and develop ideas and information into oral, print or other media texts with introductions that interest audiences and state the topic, sections that develop the topic and conclusions
Organize oral, print and other media texts into sections that relate to and develop the topic	Add, delete or combine ideas to communicate more effectively	
Record information	**Record information**	**Record information**
Make notes of key words, phrases and images by subtopics; cite titles and authors of sources alphabetically	Record information in own words; cite titles and authors alphabetically, and provide publication dates of sources	Make notes on a topic, combining information from more than one source; use reference sources appropriately
Paraphrase information from oral, print and other media sources	Combine ideas and information from several sources	Use outlines, thought webs and summaries to show the relationships among ideas and information and to clarify meaning
Evaluate information	Record ideas and information in relevant categories, according to a research plan	quote information from oral, print and other media sources
Examine gathered information to identify if more information is required; review new understanding	**Evaluate information**	**Evaluate information**
	Connect gathered information to prior knowledge to reach new conclusions	Evaluate the appropriateness of information for a particular audience and purpose
		Recognize gaps in gathered information, and suggest additional information needed for a particular audience and purpose
3.4 Share and Review		
Share ideas and information	**Share ideas and information**	**Share ideas and information**
Communicate ideas and information in a variety of oral, print and other media texts, such as short reports, talks and posters	Communicate ideas and information in a variety of oral, print and other media texts, such as illustrated reports, charts, graphic displays and travelogues	Communicate ideas and information in a variety of oral, print and other media texts, such as multiparagraph reports, question and answer formats and graphs
Select visuals, print and/or other media to add interest and to engage the audience	Select visuals, print and/or other media to inform and engage the audience	Select appropriate visuals, print and/or other media to inform and engage the audience
Review research process	**Review research process**	**Review research process**
Identify strengths and areas for improvement in research process	Assess personal research skills, using pre-established criteria	Establish goals for enhancing research skills

Grade 4	Grade 5	Grade 6
General Outcome 4	**General Outcome 4**	**General Outcome 4**
Students will listen, speak, read, write, view and represent to enhance the clarity and artistry of communication.	**Students will listen, speak, read, write, view and represent to enhance the clarity and artistry of communication.**	**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	**Appraise own and others' work**	**Appraise own and others' work**
Identify the general impression and main idea communicated by own and peers' oral, print and other media texts	Use developed criteria to provide feedback to others and to revise own work	Work collaboratively to revise and enhance oral, print and other media texts
Use pre-established criteria to provide support and feedback to peers on their oral, print and other media texts	**Revise and edit**	Ask for and evaluate the usefulness of feedback and assistance from peers
Revise and edit	revise to add and organize details that support and clarify intended meaning	**Revise and edit**
Revise to ensure an understandable progression of ideas and information	Edit for appropriate use of statements, questions and exclamations	revise to provide focus, expand relevant ideas and eliminate unnecessary information
Identify and reduce fragments and run-on sentences	**Enhance legibility**	edit for appropriate verb tense and for correct pronoun references
Edit for subject–verb agreement	Write legibly, using a style that is consistent in alignment, shape and slant	use paragraph structures in expository and narrative texts
Enhance legibility	Apply word processing skills, and use publishing programs to organize information	**Enhance legibility**
Write legibly, using a style that demonstrates awareness of alignment, shape and slant		Write legibly and at a pace appropriate to context and purpose
Use special features of software when composing, formatting and revising texts		Experiment with a variety of software design elements, such as spacing, graphics, titles and headings, and font sizes and styles, to enhance the presentation of texts

Grade 4	Grade 5	Grade 6
Expand knowledge of language	**Expand knowledge of language**	**Expand knowledge of language**
Use an increasing variety of words to express and extend understanding of concepts related to personal interests and topics of study	Extend word choice through knowledge of synonyms, antonyms and homonyms and the use of a thesaurus	Show the relationships among key words associated with topics of study, using a variety of strategies such as thought webs, outlines and lists
Recognize English words and expressions that come from other cultures or languages	Distinguish different meanings for the same word, depending on the context in which it is used	Choose words that capture a particular aspect of meaning and that are appropriate for context, audience and purpose
Enhance artistry	**Enhance artistry**	**Enhance artistry**
Experiment with combining detail, voice-over, music and dialogue with sequence of events	Experiment with words, phrases, sentences and multimedia effects to enhance meaning and emphasis	Experiment with several options, such as sentence structures, figurative language and multimedia effects, to choose the most appropriate way of communicating ideas or information
4.2 Attend to Conventions		
Attend to grammar and usage	**Attend to grammar and usage**	**Attend to grammar and usage**
Identify simple and compound sentence structures, and use in own writing	Use words and phrases to modify and clarify ideas in own writing	Identify the use of coordinate and subordinate conjunctions to express ideas
Identify correct noun–pronoun agreement, and use in own writing	Use connecting words to link ideas in sentences and paragraphs	Use complex sentence structures and a variety of sentence types in own writing
Identify past, present and future action	Identify irregular verbs, and use in own writing	Identify comparative and superlative forms of adjectives, and use in own writing
Attend to spelling	Identify past, present and future verb tenses, and use in sentences	Identify past, present and future verb tenses, and use throughout a piece of writing
Use phonic knowledge and skills and visual memory, systematically, to spell multisyllable words in own writing	**Attend to spelling**	**Attend to spelling**
Identify and apply common spelling generalizations in own writing	Use phonic knowledge and skills, visual memory, the meaning and function of words in context, and spelling generalizations to spell with accuracy in own writing	Use a variety of resources and strategies to determine and learn the correct spelling of common exceptions to conventional spelling patterns
Apply strategies for identifying and learning to spell problem words in own writing	Study and use the correct spelling of commonly misspelled words in own writing	Explain the importance of correct spellings for effective communication
	Know and consistently apply spelling conventions when editing and proofreading own writing	Edit for and correct commonly misspelled words in own writing, using spelling generalizations and the meaning and function of words in context

Grade 4	Grade 5	Grade 6
Attend to capitalization and punctuation	**Attend to capitalization and punctuation**	**Attend to capitalization and punctuation**
Use capitalization to designate organizations and to indicate the beginning of quotations in own writing	Use capital letters, appropriately, in titles, headings and subheadings in own writing	Use colons before lists, to separate hours and minutes, and after formal salutations in own writing
Use commas after introductory words in sentences and when citing addresses in own writing	Use quotation marks and separate paragraphs to indicate passages of dialogue in own writing	Identify parentheses and colons when reading, and use them to assist comprehension
Identify quotation marks in passages of dialogue, and use them to assist comprehension	Recognize various uses of apostrophes, and use them appropriately in own writing	Identify ellipses that show words are omitted or sentences are incomplete when reading, and use them to assist comprehension
4.3 Present and Share		
Present information	**Present information**	**Present information**
Present to peers ideas and information on a topic of interest, in a well-organized form	Organize ideas and information in presentations to maintain a clear focus and engage the audience	use various styles and forms of presentations, depending on content, audience and purpose
Enhance presentation	**Enhance presentation**	**Enhance presentation**
Add interest to presentations through the use of props, such as pictures, overheads and artifacts	Use effective openings and closings that attract and sustain reader or audience interest	Emphasize key ideas and information to enhance audience understanding and enjoyment
Use effective oral and visual communication	**Use effective oral and visual communication**	**Use effective oral and visual communication**
Adjust volume, tone of voice and gestures appropriately, to suit a variety of social and classroom activities	Adjust volume, tone of voice and gestures to engage the audience; arrange presentation space to focus audience attention	Demonstrate control of voice, pacing, gestures and facial expressions; arrange props and presentation space to enhance communication
Demonstrate attentive listening and viewing	**Demonstrate attentive listening and viewing**	**Demonstrate attentive listening and viewing**
Connect own ideas, opinions and experiences to those communicated in oral and visual presentations	Identify and interpret the purpose of verbal and nonverbal messages and the perspectives of the presenter	Identify the tone, mood and emotion conveyed in oral and visual presentations
Give constructive feedback, ask relevant questions, and express related opinions in response to oral and visual presentations	Show respect for the presenter’s opinions by listening politely and providing thoughtful feedback	Respond to the emotional aspects of presentations by providing nonverbal encouragement and appreciative comments

Grade 4	Grade 5	Grade 6
General Outcome 5	**General Outcome 5**	**General Outcome 5**
Students will listen, speak, read, write, view and represent to respect, support and collaborate with others.	**Students will listen, speak, read, write, view and represent to respect, support and collaborate with others.**	**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	**Appreciate diversity**	**Appreciate diversity**
Describe similarities and differences between personal experiences and the experiences of people or characters from various cultures portrayed in oral, print and other media texts	Discuss personal understanding of the lives of people or characters in various communities, cultural traditions, places and times portrayed in oral, print and other media texts	Compare personal challenges and situations encountered in daily life with those experienced by people or characters in other times, places and cultures portrayed in oral, print and other media texts
Appreciate that responses to some oral, print or other media texts may be different	Compare own and others' responses to ideas and experiences related to oral, print and other media texts	Share and discuss ideas and experiences that contribute to different responses to oral, print and other media texts
Relate texts to culture	**Relate texts to culture**	**Relate texts to culture**
Identify and discuss main characters, plots, settings and illustrations in oral, print and other media texts from diverse cultures and communities	Identify and discuss how qualities, such as courage, ambition and loyalty, are portrayed in oral, print and other media texts from diverse cultures and communities	Identify ways in which oral, print and other media texts from diverse cultures and communities explore similar ideas
Celebrate accomplishments and events	**Celebrate accomplishments and events**	**Celebrate accomplishments and events**
Use appropriate language to acknowledge special events and to honour accomplishments in and beyond the classroom	Select and use language appropriate in tone and form to recognize and honour people and events	Use appropriate language to participate in public events, occasions or traditions
Use language to show respect	**Use language to show respect**	**Use language to show respect**
Identify and discuss differences in language use in a variety of school and community contexts	Determine and use language appropriate to the context of specific situations	Demonstrate respect by choosing appropriate language
5.2 Work Within a Group		
Cooperate with others	**Cooperate with others**	**Cooperate with others**
Take responsibility for collaborating with others to achieve group goals	Accept and take responsibility for fulfilling own role as a group member	assume a variety of roles, and share responsibilities as a group member
Ask for and provide information and assistance, as appropriate, for completing individual and group tasks	Discuss and decide whether to work individually or collaboratively to achieve specific goals	identify and participate in situations and projects in which group work enhances learning and results

Grade 4	Grade 5	Grade 6
Work in groups	**Work in groups**	**Work in groups**
Share personal knowledge of a topic to develop purposes for research or investigations and possible categories of questions	Formulate questions to guide research or investigations, with attention to specific audiences and purposes	contribute to group knowledge of topics to identify and focus information needs, sources and purposes for research or investigations
Use brainstorming, summarizing and reporting to organize and carry out group projects	Contribute ideas to help solve problems, and listen and respond constructively	address specific problems in a group by specifying goals, devising alternative solutions and choosing the best alternative
Evaluate group process	**Evaluate group process**	**Evaluate group process**
Assess group process, using established criteria, and determine areas for improvement	Show appreciation for the contributions of others, and offer constructive feedback to group members	assess own contributions to group process, and set personal goals for working effectively with others

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GR 4 - 6 Mathematics

	Grade 4	Grade 5	Grade 6
Big Idea	**Number**	**Number**	**Number**
***quantity** ***operational sense** ***relationships** ***representation** ***reasoning**	Number at a glance: - add and subtract to 10 000; math facts to 9 (recall to 7); 3x1 digit multiplication with problem solving; 2 digit x 1 digit division with problem solving; fractions less than and equal to 1; decimals to the hundredths	Number at a glance: - estimating, mental math and problem solving; recall math facts to 9; 2x2digit multiplying with problem solving; 3 digit x 1 digit division with problem solving; equivalency with fractions; decimals to the thousandths; relate decimals to fractions	Number at a glance: - problem solving with whole numbers and decimal numbers; factors and multiples (prime and composite numbers); percent; integers; order of operations
The Base Ten Numeration System- is a scheme for recording numbers 0-9, groups of ten(s), and place value	1. Represent and describe whole numbers to 10 000, pictorially and symbolically. [C, CN, V]	1. Represent and describe whole numbers to 1 000 000. [C, CN, V, T] [ICT: C6–2.2]	1. Demonstrate an understanding of place value, including numbers that are: • greater than one million • less than one thousandth. [C, CN, R, T]
Numbers-the set of real numbers is infinite. Each real number can be associated with a unique point on the number line (counting numbers, whole numbers, integers, fractions/rational numbers). Estimation- approximated numerical calculations using numbers/referents that are easier to compute with mentally.	2. Compare and order numbers to 10 000. [C, CN, V]	2. Use estimation strategies in problem-solving contexts. [C, CN, ME, PS, R, V]	2. Solve problems involving whole numbers and decimal numbers. [ME, PS, T] [ICT: C6–2.4]

Big Ideas	Grade 4	Grade 5	Grade 6
Properties-for a given set of numbers there are relationships that are always true. These rules govern arithmetic and algebra (properties of operations, properties of equality) Basic Facts and Algorithms-operations with rational numbers	3. Demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3- and 4-digit numerals) by: • using personal strategies for adding and subtracting • estimating sums and differences • solving problems involving addition and subtraction. [C, CN, ME, PS, R] Note: Students investigate a variety of strategies, including standard/traditional algorithms, to become proficient in at least one appropriate and efficient strategy that they understand. Note: Through this outcome, students have the opportunity to maintain and refine previously learned addition and subtraction number facts: Grade 3, Number SO 10 – Apply mental mathematics strategies and number properties in order to understand and recall basic addition facts and related subtraction facts to 18. [C, CN, ME, PS, R, V]	3. Apply mental mathematics strategies and number properties in order to understand and recall basic multiplication facts (multiplication tables) to 81 and related division facts. [C, CN, ME, R, V] Understand, recall and apply multiplcation and related divsion facts to 9x9.	3. Demonstrate an understanding of factors and multiples by: • determining multiples and factors of numbers less than 100 • identifying prime and composite numbers • solving problems using multiples and factors. [CN, PS, R, V]
Properties-for a given set of numbers there are relationships that are always true. These rules govern arithmetic and algebra (properties of operations, properties of equality) Basic Facts and Algorithms-operations with rational numbers	4. Apply the properties of 0 and 1 for multiplication and the property of 1 for division. [C, CN, R]	4. Apply mental mathematics strategies for multiplication. [C, CN, ME, R, V]	4. Relate improper fractions to mixed numbers and mixed numbers to improper fractions. [CN, ME, R, V]

Properties-for a given set of numbers there are relationships that are always true. These rules govern arithmetic and algebra (properties of operations, properties of equality) Basic Facts and Algorithms-operations with rational numbers	5. Describe and apply mental mathematics strategies to determine basic multiplication facts to 9 × 9 and related division facts. [C, CN, ME, R] Understand and apply strategies for multiplication and related division facts to 9x9. Recall multiplication and related division facts to 7x7.	5. Demonstrate, with and without concrete materials, an understanding of multiplication (2-digit by 2-digit) to solve problems. [C, CN, PS, V] Note: Students investigate a variety of strategies, including standard/traditional algorithms, to become proficient in at least one appropriate and efficient strategy that they understand. Note: Through this outcome, students have the opportunity to maintain and refine previously learned operations of addition and subtraction with whole numbers: Grade 4, Number SO 3 – Demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3- and 4-digit numerals) by: • using personal strategies for adding and subtracting • estimating sums and differences • solving problems involving addition and subtraction. [C, CN, ME, PS, R]	5. Demonstrate an understanding of ratio, concretely, pictorially and symbolically. [C, CN, PS, R, V]
Properties-for a given set of numbers there are relationships that are always true. These rules govern arithmetic and algebra (properties of operations, properties of equality) Basic Facts and Algorithms-operations with rational numbers	6. Demonstrate an understanding of multiplication (2- or 3-digit by 1-digit) to solve problems by: • using personal strategies for multiplication with and without concrete materials • using arrays to represent multiplication • connecting concrete representations to symbolic representations • estimating products • applying the distributive property. [C, CN, ME, PS, R, V]	6. Demonstrate, with and without concrete materials, an understanding of division (3-digit by 1-digit), and interpret remainders to solve problems. [C, CN, ME, PS, R, V] Note: Students investigate a variety of strategies, including standard/traditional algorithms, to become proficient in at least one appropriate and efficient strategy that they understand. Note: Through this outcome, students have the opportunity to maintain and refine previously learned operations of addition and subtraction with whole numbers: Grade 4, Number SO 3 – Demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3- and 4-digit numerals) by: • using personal strategies for adding and subtracting • estimating sums and differences • solving problems involving addition and subtraction. [C, CN, ME, PS, R]	6. Demonstrate an understanding of percent (limited to whole numbers), concretely, pictorially and symbolically. [C, CN, PS, R, V]

Big Ideas	Grade 4	Grade 5	Grade 6
Properties-for a given set of numbers there are relationships that are always true. These rules govern arithmetic and algebra (properties of operations, properties of equality) Basic Facts and Algorithms-operations with rational numbers	7. Demonstrate an understanding of division (1-digit divisor and up to 2-digit dividend) to solve problems by: • using personal strategies for dividing with and without concrete materials • estimating quotients • relating division to multiplication. [C, CN, ME, PS, R, V]	7. Demonstrate an understanding of fractions by using concrete, pictorial and symbolic representations to: • create sets of equivalent fractions • compare fractions with like and unlike denominators. [C, CN, PS, R, V]	7. Demonstrate an understanding of integers, concretely, pictorially and symbolically. [C, CN, R, V]
Properties-for a given set of numbers there are relationships that are always true. These rules govern arithmetic and algebra (properties of operations, properties of equality) Basic Facts and Algorithms-operations with rational numbers	8. Demonstrate an understanding of fractions less than or equal to one by using concrete, pictorial and symbolic representations to: • name and record fractions for the parts of a whole or a set • compare and order fractions • model and explain that for different wholes, two identical fractions may not represent the same quantity • provide examples of where fractions are used. [C, CN, PS, R, V]	8. Describe and represent decimals (tenths, hundredths, thousandths), concretely, pictorially and symbolically. [C, CN, R, V]	8. Demonstrate an understanding of multiplication and division of decimals (1-digit whole number multipliers and 1-digit natural number divisors). [C, CN, ME, PS, R, V]
Properties-for a given set of numbers there are relationships that are always true. These rules govern arithmetic and algebra (properties of operations, properties of equality) Basic Facts and Algorithms-operations with rational numbers	9. Represent and describe decimals (tenths and hundredths), concretely, pictorially and symbolically. [C, CN, R, V]	9. Relate decimals to fractions and fractions to decimals (to thousandths). [CN, R, V]	9. Explain and apply the order of operations, excluding exponents, with and without technology (limited to whole numbers). [C, CN, ME, PS, T] [ICT: C6–2.4, C6–2.7]

Big Ideas	Grade 4	Grade 5	Grade 6
Properties-for a given set of numbers there are relationships that are always true. These rules govern arithmetic and algebra (properties of operations, properties of equality) Basic Facts and Algorithms-operations with rational numbers	10. Relate decimals to fractions and fractions to decimals (to hundredths). [C, CN, R, V]	10. Compare and order decimals (to thousandths) by using: • benchmarks • place value • equivalent decimals. [C, CN, R, V]	
Properties-for a given set of numbers there are relationships that are always true. These rules govern arithmetic and algebra (properties of operations, properties of equality) Basic Facts and Algorithms-operations with rational numbers	11. Demonstrate an understanding of addition and subtraction of decimals (limited to hundredths) by: • using personal strategies to determine sums and differences • estimating sums and differences • using mental mathematics strategies to solve problems. [C, ME, PS, R, V]	11. Demonstrate an understanding of addition and subtraction of decimals (limited to thousandths). [C, CN, PS, R, V] Note: Through this outcome, students have the opportunity to maintain and refine previously learned operations of addition and subtraction with whole numbers: Grade 4, Number SO 3 – Demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3- and 4-digit numerals) by: • using personal strategies for adding and subtracting • estimating sums and differences • solving problems involving addition and subtraction. [C, CN, ME, PS, R]	

	Grade 4	Grade 5	Grade 6
Big Idea	**Pattern and Relation**	**Pattern and Relation**	**Pattern and Relation**
*patterns *relationships *variables *expressions *equations	**Pattern and Relation at at Glance: Representing and describing patterns and relationships; identifying and explaining mathematical relationships; express a problem in an equation; solve one-step equations with a symbol**	**Pattern and Relation at at Glance: determining pattern rules; solve problems involving one step equations; express problem in an equation with a letter variable**	**Pattern and Relation at at Glance: using relationships and table of values to solve problems; understanding preservation of equality**
Patterns-are relationships that can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways. (numbers, geometry)	1. Identify and describe patterns found in tables and charts.	1. Determine the pattern rule to make predictions about subsequent elements.	1. Represent and describe patterns and relationships, using graphs and tables.
Patterns-are relationships that can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways. (numbers, geometry)	2. Translate among different representations of a pattern, such as a table, a chart or concrete materials.	2. Express a given problem as an equation in which a letter variable is used to represent an unknown number (limited to whole numbers).	2. Demonstrate an understanding of the relationships within tables of values to solve problems.
Variable-mathematical structures can be translated and represented abstractly using variables, expressions and equations.	3. Represent, describe and extend patterns and relationships, using charts and tables, to solve problems.	3. Solve problems involving single-variable, one-step equations with whole number coefficients and whole number solutions.	3. Represent generalizations arising from number relationships, using equations with letter variables.
Variable-mathematical structures can be translated and represented abstractly using variables, expressions and equations.	4. Identify and explain mathematical relationships, using charts and diagrams, to solve problems.		4. Express a given problem as an equation in which a letter variable is used to represent an unknown number.

Big Ideas	Grade 4	Grade 5	Grade 6
Variable-mathematical structures can be translated and represented abstractly using variables, expressions and equations. Equivalence/Equality-any number, measure, algebraic expression, or equation can be represented in an infinite number of ways that have the same value. (preserve the equality)	5. Express a given problem as an equation in which a symbol is used to represent an unknown number.		5. Demonstrate and explain the meaning of preservation of equality, concretely and pictorially.
Variable-mathematical structures can be translated and represented abstractly using variables, expressions and equations.	6. Solve one-step equations involving a symbol to represent an unknown number.		
	Grade 4	**Grade 5**	**Grade 6**
Big Idea	**Shape & Space**	**Shape & Space**	**Shape & Space**
Measurement			
*attributes *relationships *units	**Shape & Space at a glance: understanding digital and analog time; understanding area of 2-D shapes**	**Shape & Space at a glance: Identify 90 degree angles; understanding volume**	**Shape & Space at a glance: estimate and measure angles; developing and applying formulas for perimeter and volume; create and use formulas for perimeter, area and volume**
Measurement-some attributes of objects are measurable and can be quantified using unit amounts. (time, length, area, mass, volume, capacity, magnitude, perimeter, angles)	1. Read and record time, using digital and analog clocks, including 24-hour clocks.	1. Identify 90º angles.	1. Demonstrate an understanding of angles by: • identifying examples of angles in the environment • classifying angles according to their measure • estimating the measure of angles, using 45°, 90° and 180° as reference angles • determining angle measures in degrees • drawing and labelling angles when the measure is specified.

Big Ideas	Grade 4	Grade 5	Grade 6
Measurement-some attributes of objects are measurable and can be quantified using unit amounts. (time, length, area, mass, volume, capacity, magnitude, perimeter, angles)	2. Read and record calendar dates in a variety of formats.	2. Design and construct different rectangles, given either perimeter or area, or both (whole numbers), and make generalizations.	2. Demonstrate that the sum of interior angles is: • 180° in a triangle • 360° in a quadrilateral
Measurement-some attributes of objects are measurable and can be quantified using unit amounts. (time, length, area, mass, volume, capacity, magnitude, perimeter, angles)	3. Demonstrate an understanding of area of regular and irregular 2-D shapes by: • recognizing that area is measured in square units • selecting and justifying referents for the units cm2 or m2 • estimating area, using referents for cm2 or m2 • determining and recording area (cm2 or m2)	3. Demonstrate an understanding of measuring length (mm) by: • selecting and justifying referents for the unit mm • modelling and describing the relationship between mm and cm units, and between mm and m units	3. Develop and apply a formula for determining the: • perimeter of polygons • area of rectangles • volume of right rectangular prisms
Measurement-some attributes of objects are measurable and can be quantified using unit amounts. (time, length, area, mass, volume, capacity, magnitude, perimeter, angles)		4. Demonstrate an understanding of volume by: • selecting and justifying referents for cm3 or m3 units • estimating volume, using referents for cm3 or m3 • measuring and recording volume (cm3 or m3) • constructing right rectangular prisms for a given volume	
Measurement-some attributes of objects are measurable and can be quantified using unit amounts. (time, length, area, mass, volume, capacity, magnitude, perimeter, angles)		5. Demonstrate an understanding of capacity by: • describing the relationship between mL and L • selecting and justifying referents for mL or L units • estimating capacity, using referents for mL or L • measuring and recording capacity (mL or L).	

	Grade 4	Grade 5	Grade 6
	Shape & Space	**Shape & Space**	**Shape & Space**
3-D Objects and 2-D Shapes			
		Shape & Space 3D Objects: - 2D Shapes at a Glance: describe edges and faces of 2D shapes and 3D objects	**Shape & Space 3D Objects, 2D Shapes at a Glance: describe and compare sides and angles of polygons**
Shape and Space-2D and 3D objects can be constructed, described, classified, analyzed by their attributes.	4. Describe and construct right rectangular and right triangular prisms.	6. Describe and provide examples of edges and faces of 3-D objects, and sides of 2-D shapes that are: parallel, intersecting, perendicular, vertical, horizontal.	4. Construct and compare triangles, including: scalene, isosceles, equilateral, right, obtuse, acute in differnent orientations.
Shape and Space-2D and 3D objects can be constructed, described, classified, analyzed by their attributes.		7. Identify and sort quadrilaterals, including: rectangles, squares, trapezoids, parallelograms, rhombuses, according to their attributes.	5. Describe and compare the sides and angles of regular and irregular polygons.
Transformations			
	Shape & Space (Transformations) at a Glance: understand congruency; understand line or symmetry		**Shape & Space (Transformations) at a Glance: identify, describe and perform multiple transformations including individual designs; and on cartisian planes**
Transformations-objects in space can be transformed in an infinite number of ways. Transformations can be described and analyzed mathematically.	5. Demonstrate an understanding of congruency, concretely and pictorially.	8. Identify and describe a single transformation, including a translation, rotation and reflection of 2-D shapes.	6. Perform a combination of translations, rotations and/or reflections on a single 2-D shape, with and without technology, and draw and describe the image.
Transformations-objects in space can be transformed in an infinite number of ways. Transformations can be described and analyzed mathematically.	6. Demonstrate an understanding of line symmetry by: identifying symmetrical 2-D shapes, creating symmetrical 2-D shapes, drawing one or more lines of symmetry in a -2D shape.	9. Perform, concretely, a single transformation (translation, rotation or reflection) of a 2-D shape, and draw the image.	7. Perform a combination of successive transformations of 2-D shapes to create a design, and identify and describe the transformations.
Transformations-objects in space can be transformed in an infinite number of ways. Transformations can be described and analyzed mathematically.			8. Identify and plot points in the first quadrant of a Cartesian plane, using whole number ordered pairs.
			9. Perform and describe single transformations of a 2-D shape in the first quadrant of a Cartesian plane (limited to whole number vertices).

	Grade 4	Grade 5	Grade 6
	Statistics & Probability	**Statistics & Probability**	**Statistics & Probability**
	Statistics & Probability at a Glance: Many-to-one correspondence: Construct and interpret picto and bar graphs	**Statistics & Probability at a Glance: Construct and interpret double bar graphs**	**Statistics & Probability at a Glance: Create, label and interpret line graphs; graph collected data; analyze graph to solve problems**
Data Collection-the question to be answered determines the data that needs to be collected and how best to collect it. Data Representation-data can be represented and interpreted visually using tables, charts, and graphs.	1. Demonstrate an understanding of many-to-one correspondence.	1. Differentiate between first-hand and second-hand data.	1. Create, label and interpret line graphs to draw conclusions.
Data Collection-the question to be answered determines the data that needs to be collected and how best to collect it. Data Representation-data can be represented and interpreted visually using tables, charts, and graphs.	2. Construct and interpret pictographs and bar graphs involving many-to-one correspondence to draw conclusions.	2. Construct and interpret double bar graphs to draw conclusions.	2. Select, justify and use appropriate methods of collecting data, including: questionnaires, experiments, databases, electronic media.
			3. Graph collected data, and analyze the graph to solve problems.
Chance & Uncertainty			
Chance-the chance of an event occuring can be describe numerically. (probability)		3. Describe the likelihood of a single outcome occurring, using words such as: impossible, possible, certain.	4. Demonstrate an understanding of probability by: • identifying all possible outcomes of a probability experiment • differentiating between experimental and theoretical probability • determining the theoretical probability of outcomes in
Chance-the chance of an event occuring can be describe numerically. (probability)		4. Compare the likelihood of two possible outcomes occurring, using words such as: less likely, equally likely, more likely.	

GR 7 - 9 English Language Arts

Grade 7	Grade 8	Grade 9
General Outcome 1	**General Outcome 1:**	**General Outcome 1:**
Students will listen, speak, read, write, view and represent to explore thoughts, ideas, feelings and experiences.	**Students will listen, speak, read, write, view and represent to explore thoughts, ideas, feelings and experiences.**	**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	**Express ideas and develop understanding**	**Express ideas and develop understanding**
extend understanding of ideas and information by finding and exploring oral, print and other media texts on related topics and themes.	revise understanding and expression of ideas by connecting new and prior knowledge and experiences	talk with others and experience a variety of oral, print and other media texts to explore, develop and justify own opinions and points of view
express personal understandings of ideas an information based on prior knowledge, experiences with others and a variety of oral, print and other media texts.	review, reread, discuss and reflect on oral, print and other media texts to explore, confirm or revise understanding	explore and explain how interactions with others and with oral, print and other media texts affect personal understandings
reflect on own observations and experiences to understand and develop oral, print and other media texts	seek out and consider diverse ideas, opinions and experiences to develop and extend own ideas, opinions and experiences	extend understanding by taking different points of view when rereading and reflecting on oral, print and other media texts
Experiment with language and forms	**Experiment with language and forms**	**Experiment with language and forms**
discuss and respond to ways that content and forms of oral, print and other media texts interact to influence understanding	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	develop and extend understanding by expressing and responding to ideas on the same topic, in a variety of forms of oral, print and other media texts
Express preferences	**Express preferences**	**Express preferences**
explore and assess oral, print and other media texts recommended by others	pursue personal interest in specific genres by particular writers, artists, storytellers and filmmakers	explain preferences for texts and genres by particular writers, artists, storytellers and filmmakers
Set goals	**Set goals**	**Set goals**
use appropriate terminology to discuss developing abilities in personal language learning and use	examine and reflect on own growth in effective use of language to revise and extend personal goals	reflect on own growth in language learning and use, by considering progress over time and the attainment of personal goals
1.2 Clarify and Extend		
Consider others' ideas	**Consider others' ideas**	**Consider others' ideas**
listen and respond constructively to alternative ideas or opinions	acknowledge the value of the ideas and opinions of others in exploring and extending personal interpretations and perspectives	integrate own perspectives and interpretations with new understandings developed through discussing and through experiencing a variety of oral, print and other media texts
Combine ideas	**Combine ideas**	**Combine ideas**
use talk, writing and representing to examine, clarify and assess understanding of ideas, information and experiences	exchange ideas and opinions to clarify understanding and to broaden personal perspectives	examine and re-examine ideas, information and experiences from different points of view to find patterns and see relationships
Extend understanding	**Extend understanding**	**Extend understanding**
talk with others to elaborate ideas, and ask specific questions to seek helpful feedback	reconsider and revise initial understandings and responses in light of new ideas, information and feedback from others	assess whether new information extends understanding by considering diverse opinions and exploring ambiguities

Legend

Essential Outcome
Supporting Outcome
Connecting to Social Studies

Grade 7	Grade 8	Grade 9
General Outcome 2	**General Outcome 2**	**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.	**Students will listen, speak, read, write, view and represent to comprehend and respond personally and critically to oral, print and other media texts.**	**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 prior knowledge**	**Use prior knowledge**
select and focus relevant ideas from personal experiences and prior knowledge to understand new ideas and information	use strategies to supplement and extend prior knowledge and experiences when interpreting new ideas and information	discuss how interpretations of the same text might vary, according to the prior knowledge and experiences of various readers
use expectations and preferences developed during previous reading experiences to select and read new texts with purpose	use knowledge of authors, forms and genres, developed during previous reading, to direct and extend reading experiences	use previous reading experiences, personal experiences and prior knowledge as a basis for reflecting on and interpreting ideas encountered
Use comprehension strategies	**Use comprehension strategies**	**Use comprehension strategies**
identify, connect, and summarize in own words, the main ideas from two or more sources on the same topic	enhance understanding by paraphrasing main ideas and supporting details, and by rereading and discussing relevant passages	identify explicit and implicit ideas and information in texts; listen and respond to various interpretations of the same text
use concept mapping and mental rehearsal to remember main ideas and relevant details	monitor understanding; skim, scan or read slowly and carefully, as appropriate, to enhance comprehension	select appropriate reading rate and strategies for comprehending texts less closely connected to prior knowledge and personal experiences
adjust reading rate and strategies to account for changes in structural features of texts and complexity of content	take notes, make outlines and use such strategies as read, recite, review to comprehend and remember ideas and information	preview complex texts as to their intent, content and structure, and use this information to set a purpose and select strategies for reading
Use textual cues	**Use textual cues**	**Use textual cues**
identify and use visual and textual cues, such as numbers, bullets and words; for example, first/then/next, before/after, on the one hand/on the other hand and if/then, that signal organizational patterns in print and other media texts, to enhance understanding of ideas and information	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	use knowledge of visual and textual cues and structural features when skimming and scanning various print and other media texts to locate relevant information effectively and efficiently
identify and use, effectively and efficiently, structural features of textbooks, such as tables of contents and indices, to access ideas and information and to read with purpose	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	analyze and discuss how the structural features of informational materials, such as textbooks, bibliographies, databases, catalogues, web sites, commercials and newscasts, enhance the effectiveness and efficiency of communication
Use phonics and structural analysis	**Use phonics and structural analysis**	**Use phonics and structural analysis**
apply, flexibly, knowledge of phonics, sight vocabulary, structural analysis, language and context clues, depending on the purpose and rate of reading	choose and use strategies for word identification, vocabulary development and spelling that either build on specific strengths or address areas for improvement	apply and explain effective procedures for identifying and comprehending words in context; adjust procedures according to the purpose for reading and the complexity of the texts
Use references	**Use references**	**Use references**
skim and scan reference materials to confirm the spellings or locate the meanings of unfamiliar words	use a thesaurus to extend vocabulary and locate appropriate words that express particular aspects of meaning	use reference materials, including a writer's handbook, to verify correct usage, address uncertainties and solve problems that arise

Legend

Essential Outcome
Supporting Outcome
Connecting to Social Studies

Grade 7	Grade 8	Grade 9
2.2 Respond to Texts		
Experience various text	**Experience various text**	**Experience various text**
experience oral, print and other media texts from a variety of cultural traditions and genres, such as journals, nature programs, short stories, poetry, letters, CDROM programs, mysteries, historical fiction, drawings and prints	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	experience oral, print and other media texts from a variety of cultural traditions and genres, such as essays, broadcast advertisements, novels, poetry, documentaries, films, electronic magazines and realistic fiction
justify own point of view about oral, print and other media texts, using evidence from texts	write and represent narratives from other points of view	identify and discuss how timeless themes are developed in a variety of oral, print and other media texts
organize interpretations of oral, print and other media texts around two or three key ideas	expect that there is more than one interpretation for oral, print and other media texts, and discuss other points of view	consider historical context when developing own points of view or interpretations of oral, print and other media texts
express interpretations of oral, print and other media texts in another form or genre	explain connections between own interpretation and information in texts, and infer how texts will influence others	compare and contrast own life situation with themes of oral, print and other media texts
predict and discuss the consequences of events or characters' actions, based on information in oral, print and other media texts	make connections between biographical information about authors, illustrators, storytellers and filmmakers and their texts	express the themes of oral, print or other media texts in different forms or genres
		consider peers' interpretations of oral, print and other media texts, referring to the texts for supporting or contradicting evidence
Construct meaning from texts	**Construct meaning from texts**	**Construct meaning from texts**
compare the choices and behaviours of characters portrayed in oral, print and other media texts with those of self and others	interpret the choices and motives of characters portrayed in oral, print and other media texts, and examine how they relate to self and others	analyze how the choices and motives of characters portrayed in oral, print and other media texts provide insight into those of self and others
analyze plot, characters, conflict, theme and setting	identify and describe characters' attributes and motivations, using evidence from the text and personal experiences	identify and discuss theme and point of view in oral, print and other media texts
identify and explain conflict, and discuss how it develops and may be resolved	discuss various ways characters are developed and the reasons for and plausibility of character change	discuss and explain various interpretations of the same oral, print or other media tex
develop, clarify and defend own interpretation, based on evidence from the text with support from own experiences	compare two similar oral, print or other media texts by considering the characters, plot, conflicts and main ideas	relate the themes, emotions and experiences portrayed in oral, print and other media texts to issues of personal interest or significance
Appreciate the artistry of texts	**Appreciate the artistry of texts**	**Appreciate the artistry of texts**
discuss how techniques, such as colour, shape, composition, suspense, foreshadowing and flashback, are used to communicate meaning and enhance effects in oral, print and other media 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	discuss how techniques, such as irony, symbolism, perspective and proportion, communicate meaning and enhance effect in oral, print and other media texts
identify and explain the usefulness, effectiveness and limitations of various forms of 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	discuss character development in terms of consistency of behaviour and plausibility of change
reflect on, revise and elaborate on initial impressions of oral, print and other media texts, through subsequent reading, listening and viewing activities	identify and discuss how word choice and order, figurative language, plot, setting and character work together to create mood and tone	describe how theme, dominant impression and mood are developed and sustained through choices in language use and the interrelationship of plot, setting and character

Grade 7	Grade 8	Grade 9
		identify features that define particular oral, print and other media texts; discuss differences in style and their effects on content and audience impression
2.3 Understand Forms, Elements and Techniques		
Understand forms and genres	**Understand forms and genres**	**Understand forms and genres**
identify key characteristics of a variety of forms or genres of oral, print and other media texts.	discuss how the choice of form or genre of oral, print and other media texts is appropriate to purpose and audience	explain the relationships between purposes and characteristics of various forms and genres of oral, print and other media texts
identify the characteristics of different types of media texts	compare the usefulness of different types of media texts	evaluate the effectiveness of different types of media texts for presenting ideas and information
Understand techniques and elements	**Understand techniques and elements**	**Understand techniques and elements**
discuss connections among plot and subplot, main and supporting characters, main idea and theme in a variety of oral, print and other media texts	distinguish theme from topic or main idea in oral, print and other media texts	compare the development of character, plot and theme in two oral, print or other media texts
identify the narrator's perspective, and explain how it affects the overall meaning of a text	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	evaluate the effectiveness of oral, print and other media texts, considering the believability of plot and setting, the credibility of characters, and the development and resolution of conflict
identify and explain how narrative hooks, foreshadowing, flashback, suspense and surprise endings contribute to the effectiveness of plot development	compare and contrast the different perspectives provided by first and third person narration	compare a main character in one text to the main character in another text from a different era, genre or medium
explain how sound and image work together to create effects in media texts	summarize the content of media texts, and discuss the choices made in planning and producing them	identify ways that a change in narrator might affect the overall meaning of oral, print and other media texts
		summarize the content of media texts, and suggest alternative treatments
Experiment with language	**Experiment with language**	**Experiment with language**
explore surprising and playful uses of language and visuals in popular culture, such as cartoons, animated films and limericks; explain ways in which imagery and figurative language, such as simile, convey meaning	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	analyze creative uses of language and visuals in popular culture, such as advertisements, electronic magazines and the Internet; recognize how imagery and figurative language, such as metaphor, create a dominant impression, mood and tone
2.4 Create Original Text		
Generate ideas	**Generate ideas**	**Generate ideas**
choose appropriate strategies for generating ideas and focusing topics for oral, print and other media texts	create oral, print and other media texts related to issues encountered in texts and in own life	generalize from own experience to create oral, print and other media texts on a theme
Elaborate on the expression of ideas	**Elaborate on the expression of ideas**	**Elaborate on the expression of ideas**
use suspense, exaggeration, foreshadowing, dialogue and description to show rising action and develop conflict	retell oral, print and other media texts from different points of view	create oral, print and other media texts on common literary themes
Structure texts	**Structure texts**	**Structure texts**
create oral, print and other media texts that are unified by point of view, carefully developed plot and endings consistent with previous events.	create oral, print and other media texts with both main and minor characters	create oral, print and other media texts that interrelate plot, setting and character, and reveal the significance of the action
create a variety of oral, print and other media texts to explore ideas related to particular topics or themes	choose forms or genres of oral, print or other media texts for the particular affects they will have on audiences and purposes	create oral, print and other media texts that include main and minor characters, and show how the main character develops and changes as a result of the action and events

Legend

- Essential Outcome
- Supporting Outcome
- Connecting to Social Studies

Grade 7	Grade 8	Grade 9
General Outcome 3	**General Outcome 3**	**General Outcome 3**
Students will listen, speak, read, write, view and represent to manage ideas and information.	**Students will listen, speak, read, write, view and represent to manage ideas and information.**	**Students will listen, speak, read, write, view and represent to manage ideas and information.**
3.1 Plan and Focus		
Focus attention	**Focus attention**	**Focus attention**
consider audience, purpose, point of view and form when focusing topics for investigation	experiment with several ways to focus a topic, and select a form appropriate to audience and purpose	synthesize ideas and information from a variety of sources to develop own opinions, points of view and general impressions
use note-taking, outlining or representing to summarize important ideas and information in oral, print and other media texts P	identify and trace the development of arguments, opinions or points of view in oral, print and other media texts	assess adequacy, accuracy, detail and appropriateness of oral, print and other media texts to support or further develop arguments, opinions or points of view
Determine information needs	**Determine information needs**	**Determine information needs**
discuss the types and sources of information appropriate for topic, audience, form, purpose and point of view	select the most appropriate information sources for topic, audience, purpose and form	select types and sources of information to achieve an effective balance between researched information and own ideas
Plan to gather information	**Plan to gather information**	**Plan to gather information**
plan and organize data collection based on instructions, explanations and pre-established parameters	choose a plan to access, gather and record information, according to self-selected parameters	select information sources that will provide effective support, convincing argument or unique perspectives
3.2 Select and Process		
Use a variety of sources	**Use a variety of sources**	**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	obtain information from a variety of sources, such as artifacts, debates, forums, biographies, autobiographies, surveys, documentaries, films, CDROMs, charts and tables, when conducting research	obtain information reflecting multiple perspectives from a variety of sources, such as expository essays, graphs, diagrams, online catalogues, periodical indices, film libraries, electronic databases and the Internet, when conducting research
Access information	**Access information**	**Access information**
use a variety of tools and text features, such as headings, subheadings, topic sentences, summaries, staging and pacing, and highlighting, to 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	expand and use a variety of tools and text features, such as organizational patterns of texts, page layouts, font styles and sizes, colour and voiceovers, to access information
Access information	**Access information**	**Access information**
distinguish between fact and opinion, and follow the development of argument and opinion	record key ideas and information from oral, print and other media texts, avoiding overuse of direct quotations	distinguish between primary and secondary sources, and determine the usefulness of each for research purposes
scan to locate specific information quickly; summarize and record information useful for research purposes	adjust rate of reading or viewing to suit purpose and density of information in print or other media texts	follow up on cited references to locate additional information
Evaluate sources	**Evaluate sources**	**Evaluate sources**
use pre-established criteria to evaluate the usefulness of a variety of information sources in terms of their structure and purpose	develop and use criteria for evaluating the usefulness, currency and reliability of information for a particular research project	evaluate sources for currency, reliability and possible bias of information for a particular research project
3.3 Organize, Record and Evaluate		
Organize information	**Organize information**	**Organize information**
organize ideas and information by selecting or developing categories appropriate to a particular topic and purpose	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 by developing and selecting appropriate categories and organizational structures

Legend

Essential Outcome
Supporting Outcome
Connecting to Social Studies

Grade 7	Grade 8	Grade 9
produce oral, print and other media texts with well-developed and well-linked ideas and sections	organize ideas and information to establish an overall impression or point of view in oral, print and other media texts	balance all sections of oral, print and other media texts and ensure sentences, paragraphs and key ideas are linked throughout
		develop coherence by relating all key ideas to the overall purpose of the oral, print or other media text
Record information	**Record information**	**Record information**
make notes, using headings and subheadings or graphic organizers appropriate to a topic; reference sources	make notes in point form, summarizing major ideas and supporting details; reference sources	use own words to summarize and record information in a variety of forms; paraphrase and/or quote relevant facts and opinions; reference sources
reflect on ideas and information to form own opinions with evidence to support them	discard information that is irrelevant for audience, purpose, form or point of view	select and record ideas and information that will support an opinion or point of view, appeal to the audience, and suit the tone and length of the chosen form of oral, print or other media text
compare, contrast and combine ideas and information from several sources	use a consistent and approved format to give credit for quoted and paraphrased ideas and information	choose specific vocabulary, and use conventions accurately and effectively to enhance credibility
Evaluate information	**Evaluate information**	**Evaluate information**
assess if the amount and quality of gathered information is appropriate to purpose and audience; address information gaps	evaluate the relevance and importance of gathered information; address information gaps	evaluate usefulness, relevance and completeness of gathered information; address information gaps
connect new information with prior knowledge to build new understanding	incorporate new information with prior knowledge and experiences to develop new understanding	evaluate usefulness, relevance and completeness of gathered information; address information gaps
3.4 Share and Review		
Share ideas and information	**Share ideas and information**	**Share ideas and information**
communicate ideas and information in a variety of oral, print and other media texts, such as reports, autobiographies, brochures and video presentations	communicate ideas and information in a variety of oral, print and other media texts, such as interviews, minilessons and documentaries	communicate ideas and information in a variety of oral, print and other media texts, such as media scripts, multimedia presentations, panel discussions and articles
use appropriate visual, print and/or other media effectively to inform and engage the audience	integrate appropriate visual, print and/or other media to inform and engage the audience	integrate appropriate visual, print and/or other media to reinforce overall impression or point of view and engage the audience
Review research process	**Review research process**	**Review research process**
identify strengths and areas for improvement in personal research skills	assess the research process, and consider alternative ways of achieving research goals	reflect on the research process, identifying areas of strength and ways to improve further research activities

Legend

- Essential Outcome
- Supporting Outcome
- Connecting to Social Studies

Grade 7	Grade 8	Grade 9
General Outcome 4	**General Outcome 4**	**General Outcome 4**
Students will listen, speak, read, write, view and represent to enhance the clarity and artistry of communication.	**Students will listen, speak, read, write, view and represent to enhance the clarity and artistry of communication.**	**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	**Appraise own and others' work**	**Appraise own and others' work**
identify particular content features that enhance the effectiveness of published oral, print and other media texts	share draft oral, print and other media texts in a way that will elicit useful feedback	share sample treatments of a topic with peers, and ask for feedback on the relative effectiveness of each
incorporate particular content features of effective texts into own oral, print and other media texts	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	work collaboratively to make appropriate revisions based on feedback provided by peers
Revise and edit	**Revise and edit**	**Revise and edit**
revise introductions, conclusions and the order of ideas and information to add coherence and clarify meaning	revise by adding words and phrases that emphasize important ideas or create dominant impressions	revise to ensure effective introductions, consistent points of view, effective transitions between ideas and appropriate conclusions

Grade 7	Grade 8	Grade 9
revise to eliminate unnecessary repetition of words and ideas	revise to enhance sentence variety, word choice and appropriate tone	revise to enhance effective transitions between ideas and maintain a consistent organizational pattern
use paragraphs, appropriately, to organize narrative and expository texts	enhance the coherence and impact of documents, using electronic editing functions	revise to combine narration, description and exposition effectively
	use paragraph structures to demonstrate unity and coherence	
Enhance legibility	**Enhance legibility**	**Enhance legibility**
choose and use printing, cursive writing or word processing, depending on the task, audience and purpose	vary handwriting style and pace, depending on the context, audience and purpose	develop personal handwriting styles appropriate for a variety of purposes
identify how the format of documents enhances the presentation of content	choose an effective format for documents, depending on the content, audience and purpose	identify and experiment with some principles of design that enhance the presentation of texts
Expand knowledge of language	**Expand knowledge of language**	**Expand knowledge of language**
identify differences between standard English and slang, colloquialism or jargon, and explain how these differences affect meaning	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	distinguish between the denotative and connotative meaning of words, and discuss effectiveness for achieving purpose and affecting audience
identify and explain figurative and metaphorical use of language in context	infer the literal and figurative meaning of words in context, using idioms, analogies, metaphors and similes	explore the derivation and use of words, phrases and jargon, including variations in language, accent and dialect in Canadian communities and regions
		experiment with the language and components of particular forms to communicate themes or represent the perspectives of a variety of people or characters
Enhance artistry	**Enhance artistry**	**Enhance artistry**
experiment with figurative language, illustrations and video effects to create visual images, provide emphasis or express emotion	experiment with figurative language, voice, sentence patterns, camera angle and music to create an impression or mood	choose words, language patterns, illustrations or sounds to create a variety of effects in oral, print and other media texts
4.2 Attend to Conventions		
Attend to grammar and usage	**Attend to grammar and usage**	**Attend to grammar and usage**
use a variety of subordinate clauses correctly and appropriately in own writing	use words and phrases to modify, clarify and enhance ideas and descriptions in own writing	identify and use parallel structure in own writing
use correct subject–verb agreement in sentences with compound subjects	use a variety of simple, compound and complex sentence structures to communicate effectively, and to make writing interesting	identify and use coordination, subordination and apposition to enhance communication
distinguish between formal and informal conventions of oral and written language, and use each appropriately, depending on the context, audience and purpose	use correct pronoun– antecedent agreement in own writing	use a variety of strategies to make effective transitions between sentences and paragraphs in own writing
identify and use common subjective and objective forms of pronouns, appropriately and correctly in own writing	use verb tenses consistently throughout a piece of writing	
Attend to spelling	**Attend to spelling**	**Attend to spelling**
use reference materials to confirm spellings and to solve spelling problems when editing and proofreading	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	demonstrate the deliberate, conscientious and independent application of a variety of editing and proofreading strategies to confirm spellings in own writing
extend spelling vocabulary to include words frequently used in literature, but infrequently used in oral 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 situations in which careful attention to correct spelling is especially important

Legend

- Essential Outcome
- Supporting Outcome
- Connecting to Social Studies

Grade 7	Grade 8	Grade 9
apply specific and effective strategies for learning and remembering the correct spelling of 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	identify and use variant spellings for particular effects, depending on audience, purpose, content and context
Attend to capitalization and punctuation	**Attend to capitalization and punctuation**	**Attend to capitalization and punctuation**
use periods and commas with quotation marks that indicate direct speech in own writing	use hyphens to break words at the end of lines, and to make a new word from two related words in own writing	use quotation marks to distinguish words being discussed in own writing
use commas to separate phrases and clauses in own writing	identify semicolons, dashes and hyphens when reading, and use them to assist comprehension	use dashes to show sentence breaks or interrupted speech, where appropriate in own writing
use quotation marks to identify information taken from secondary sources in own writing	use parentheses appropriately in own writing	know that rules for punctuation can vary, and adjust punctuation use for effect in own writing
	use appropriate capitalization and punctuation for referencing oral, print and other media texts	
4.3 Present and Share		
Present information	**Present information**	**Present information**
present ideas and opinions confidently, but without dominating the discussion, during small group activities and short, whole class sessions	plan and facilitate small group and short, whole class presentations to share information	select, organize and present information to appeal to the interests and background knowledge of various readers or audiences
Enhance presentation	**Enhance presentation**	**Enhance presentation**
clarify and support ideas or opinions with details, visuals or media techniques	present information to achieve a particular purpose and to appeal to interest and background knowledge of reader or audience	choose appropriate types of evidence and strategies to clarify ideas and information, and to convince various readers and audiences
Use effective oral and visual communication	**Use effective oral and visual communication**	**Use effective oral and visual communication**
identify and use explicit techniques to arouse and maintain interest and to convince the audience	plan and shape presentations to achieve particular purposes or effects, and use feedback from rehearsals to make modifications	integrate a variety of media and display techniques, as appropriate, to enhance the appeal, accuracy and persuasiveness of presentations
Demonstrate attentive listening and viewing	**Demonstrate attentive listening and viewing**	**Demonstrate attentive listening and viewing**
listen and view attentively to organize and classify information and to carry out multistep instructions	anticipate the organizational pattern of presentations, and identify important ideas and supporting details	follow the train of thought, and evaluate the credibility of the presenter and the evidence provided
ask questions or make comments that elicit additional information; probe different aspects of ideas, and clarify understanding	use appropriate verbal and nonverbal feedback to respond respectfully	provide feedback that encourages the presenter and audience to consider other ideas and additional information

Legend

- Essential Outcome
- Supporting Outcome
- Connecting to Social Studies

Grade 7	Grade 8	Grade 9
General Outcome 5	**General Outcome 5**	**General Outcome 5**
Students will listen, speak, read, write, view and represent to respect, support and collaborate with others.	**Students will listen, speak, read, write, view and represent to respect, support and collaborate with others.**	**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	**Appreciate diversity**	**Appreciate diversity**
discuss how ideas, people, experiences and cultural traditions are portrayed in various oral, print and other media texts	compare own with others' understanding of people, cultural traditions and values portrayed in oral, print and other media texts	examine how personal experiences, cultural traditions and Canadian perspectives are presented in oral, print and other media texts
explain how differing perspectives and unique reactions expand understanding	clarify and broaden perspectives and opinions, by examining the ideas of others	take responsibility for developing and sharing oral, print and other media texts and for responding respectfully to the texts of others

Grade 7	Grade 8	Grade 9
Relate texts to culture	**Relate texts to culture**	**Relate texts to culture**
identify and discuss recurring themes in oral, print and other media texts from diverse cultures and communities	compare ways in which oral, print and other media texts reflect specific elements of cultures or periods in history	analyze how oral, print and other media texts reflect the traditions, beliefs and technologies of different cultures, communities or periods in history
Celebrate accomplishments and events	**Celebrate accomplishments and events**	**Celebrate accomplishments and events**
select and use appropriate form and tone for specific audiences to celebrate special events and accomplishments	participate in organizing and celebrating special events, recognizing the appropriateness and significance of language arts	explore and experiment with various ways in which language arts are used across cultures, age groups and genders to honour and celebrate people and events
Use language to show respect	**Use language to show respect**	**Use language to show respect**
demonstrate respect for diverse ideas, cultures and traditions portrayed in oral, print and other media texts	use inclusive language and actions that demonstrate respect for people of different races, cultures, genders, ages and abilities	create or use oral, print and other media texts in ways that are respectful of people, opinions, communities and cultures
5.2 Work Within a Group		
Cooperate with others	**Cooperate with others**	**Cooperate with others**
contribute collaboratively in group situations, by asking questions and building on the ideas of others	propose ideas or advocate points of view that recognize the ideas of others and advance the thinking of the group	contribute to group efforts to reach consensus or conclusions, by engaging in dialogue to understand the ideas and viewpoints of others
take responsibility for assuming a variety of roles in a group, depending on changing contexts and needs	use opportunities as a group member to contribute to group goals and extend own learning	discuss and choose ways to coordinate the abilities and interests of individual group members to achieve group goals
Work in groups	**Work in groups**	**Work in groups**
contribute ideas, knowledge and questions to establish an information base for research or investigations	contribute ideas, knowledge and strategies to identify group information needs and sources	generate and access ideas in a group, and use a variety of methods to focus and clarify topics for research or investigations
assist in setting and achieving group goals by inviting others to speak, suggesting alternatives, assigning tasks, sharing resources, following up on others' ideas and listening to a variety of points of view	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	share responsibility for the completion of team projects by establishing clear purpose and procedures for solving problems, monitoring progress and making modifications to meet stated objectives
Evaluate group process	**Evaluate group process**	**Evaluate group process**
evaluate group process and personal contributions according to pre-established criteria to determine strengths and areas for improvement	evaluate the quality of own contributions to group process, and offer constructive feedback to others; propose suggestions for improvement	establish and use criteria to evaluate group process and personal contributions; set goals and make plans for improvement

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Essential Outcome
Supporting Outcome
Connecting to Social Studies

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GR 7 - 8 Social Studies Connections

Grade 7				Grade 8			
Reading				**Reading**			
Essential Skills	**Related EO**	**Examples**	**Social Studies Connections**	**Essential Skills**	**Related EO**	**Examples and Clarification**	**Social Studies Connections**
Extend Knowledge	identify particular content features that enhance the effectiveness of published oral, print and other media texts	text features examine variety of texts political cartoons	textbook primary and secondary sources **Values and Attitudes**-compare ways in which texts reflect specific elements of cultures or periods in history Historical Thinking analyze selected issues and problems from the past, placing people and events in a context of time and place	Extend Knowledge	distinguish theme from topic or main idea in texts	direct instruction using a familiar story (live videoconference)	**Values and Attitudes** compare ways in which texts reflect specific elements of cultures or periods in history **Historical Thinking** analyze selected issues and problems from the past, placing people and events in a context of time and place
Accessing views, ideas, and experiences	identify and use, effectively and efficiently, structural features of textbooks, such as tables of contents and indices, to access ideas and information and to read with purpose	cloze reading activities	textbook, cloze reading activities	Increase understanding of self and others	explain connections between own interpretation and information in texts, and infer how texts will influence others	text to text; text to self; text to world	**Cooperation, Conflict Resolution and Consensus Building** demonstrate leadership in groups, where appropriate, to achieve consensus and resolve conflicts peacefully and equitably
					clarify and broaden perspectives and opinions, by examining the ideas of others	TED Talks; public speeches, editorials	
Construct meaning	compare the choices and behaviours of characters portrayed in oral, print and other media texts with those of self and others	What would you do? - bell ringer prompt	French, English, Indigenous societal perspectives critical thinking Ask students what would you do in the situation - perspective taking fact versus opinion historical fiction historical diary entries confederation	Construct meaning	enhance understanding by paraphrasing main ideas and supporting details, and by rereading and discussing relevant passages	concisely summarize in your own words and reread to confirm the summary	**Media Literacy** examine techniques used to enhance the authority and authenticity of media messages
	analyze plot, characters, conflict, theme and setting	short stories read alouds			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	

Grade 7				Grade 8			
Construct meaning	distinguish between fact and opinion, and follow the development of argument and opinion	current events anayze websites	Media Literacy-examine techniques used to enhance the authority and authenticity of media messages	Construct meaning	identify ways that characters can be developed, and discuss how character, plot and setting are interconnected and mutually supportive	plot outline; character development; indirect characterization; Speak, Thoughts, Effects on others, Actions, Looks (STEAL)	
Comprehend and Respond	connect new information with prior knowledge to build new understanding	reading comprehension reading response reading strategies	How did we get here? How did what happened in the past shape today? Weekly blog - Social content **Values and Attitudes**-value the diversity, respect the dignity and support the equality of all human beings	Comprehend and Respond	interpret the choices and motives of characters portrayed in texts, and examine how they relate to self and others	character to self; character to others	**Values and Attitudes** value the diversity, respect the dignity and support the equality of all human beings
	listen and respond constructively to alternative ideas or opinions	discussions					
	develop, clarify and defend own interpretation, based on evidence from the text with support from own experiences	blog - paragraph writing					
	identify and explain figurative and metaphorical use of language in context	read alouds think alouds					
Essential Reading Strategies	select and focus relevant ideas from personal experiences and prior knowledge to understand new ideas and information	modelling how to read text - think alouds building background knowledge provide multiple sources on a topic	modelling how to read text - think alouds graphic organizers If a different choice had been made in history, what would be different today? What motivated the choices of people in history? research skill **Critical Thinking and Creative Thinking**-determine the validity of information based on context, bias, source, objectivity, evidence and/or reliability to broaden understanding of a topic or an issue	Essential Reading Strategies	revise understanding and expression of ideas by connecting new and prior knowledge and experiences	text to self	**Critical Thinking and Creative Thinking** determine the validity of information based on context, bias, source, objectivity, evidence and/or reliability to broaden understanding of a topic or an issue
	use concept mapping and mental rehearsal to remember main ideas and relevant details	graphic organizers			choose and use strategies for word identification, vocabulary development and spelling that either build on specific strengths or address areas for improvement	Making Words, Word Work	
	adjust reading rate and strategies to account for changes in structural features of texts and complexity of content	practice reading stratgies provide shared reading opportunities buddy reading			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	text features	

Grade 7				Grade 8			
Essential Reading Strategies	predict and discuss the consequences of events or characters' actions, based on information in oral, print and other media texts	discussion response journals/activities		Essential Reading Strategies	infer the literal and figurative meaning of words in context,	using idioms, analogies, metaphors and similes	
	scan to locate specific information quickly; summarize and record information useful for research purposes	reading stratgy research skill graphic organizers					
*text refers to oral, print, and other media texts				*text refers to oral, print, and other media texts			

Grade 7				Grade 8			
Writing				**Writing**			
Essential Skills	**Related EO**	**Examples**	**Social Studies Connections**	**Essential Skills**	**Related EO**	**Examples and Clarification**	**Social Studies Connections**
Plan & Research	choose appropriate strategies for generating ideas and focusing topics for oral, print and other media texts	graphic organizer discussions outlines	**Research for Deliberative Inquiry** Reflect on changes of perspective or opinion based on information gathered and research conducted.	Plan & Research	select the most appropriate information sources for topic, audience, purpose and form	choosing who, what, and why before researching information (using criteria)	**Research for Deliberative Inquiry** Reflect on changes of perspective or opinion based on information gathered and research conducted.
	create a variety of oral, print and other media texts to explore ideas related to particular topics or themes	one pager student choice of how to present knowledge choice boards			organize ideas and information to establish an overall impression or point of view in texts	create a plan to write comparison, chronology, or cause–effect	
	consider audience, purpose, point of view and form when focusing topics for investigation	paraagraph writing essays persuasive piece narratives			make notes in point form, summarizing major ideas and supporting details; reference sources	outline, web, point-form, list, flow chart	
	plan and organize data collection based on instructions, explanations and pre-established parameters	graphic organizers following written directions asking questions			discard information that is irrelevant for audience, purpose, form or point of view	Picking appropriate or the best information from gathered research based on criteria	
	make notes, using headings and subheadings or graphic organizers appropriate to a topic; reference sources	exemplars easybib.com					

Grade 7				Grade 8			
Draft & Craft	express personal understandings of ideas an information based on prior knowledge, experiences with others and a variety of texts.	written responses paragraph writing providing evidence using and referencing quotes	hold trials of historical figures role play - secure funding for next voyage **Decision Making and Problem Solving**-take appropriate action and initiative, when required, in decision-making and problem-solving scenarios	Draft & Craft	create texts related to issues encountered in texts and in own life	journaling, diary, narrative, personal response	**Decision Making and Problem Solving** take appropriate action and initiative, when required, in decision-making and problem-solving scenarios
	organize interpretations of oral, print and other media texts around two or three key ideas	research short stories			experiment with figurative language, voice, sentence patterns, camera angle and music to create an impression or mood	varied sentences for interest, imagery for poetry and narrative, picutures or illustrations	
	produce oral, print and other media texts with well-developed and well-linked ideas and sections	presentations transitions			use words and phrases to modify, clarify and enhance ideas and descriptions in own writing	thesaurus, ask for help from a parent or teacher, collaboration, peer review if possible	
	experiment with figurative language, illustrations and video effects to create visual images, provide emphasis or express emotion	provide multiple opportunities and methods to present understanding choice board					
	identify and use explicit techniques to arouse and maintain interest and to convince the audience	exemplars presentations competitions debates/discussions					
Edit & Revise	Revise introductions, conclusions and the order of ideas and information to add coherence and clarify meaning	mini-lessons & exemplars peer revision - you must ask your peer 3 questions	Applies to any piece of writing	Edit & Revise	4.2 Attend to Conventions	Attend to Spelling: use knowledge of spelling generalizations and how words are formed to spell technical terms and unfamiliar words in own writing	
	4.2 Attend to Conventions	extend spelling vocabulary to include words frequently used in literature, but infrequently used in oral and other media texts				Add, delete or combine ideas to communicate more effectively	
		use commas to separate phrases and clauses in own writing				use appropriate capitalization and punctuation	
		use quotation marks to identify information taken from secondary sources in own writing					

Grade 7				Grade 8			
Edit & Revise		**Attend to grammar and usage**: use a variety of subordinate clauses correctly and appropriately in own writing					
Publish	create oral, print and other media texts that are unified by point of view, carefully developed plot and endings consistent with previous events.	narrative writing historical writing	timeline historical journals historical scene historical graphic **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"	Publish	Revise by adding words and phrases that emphasize important ideas or **create dominant impressions**	making sure word choices in completed work meets the intentional idea	**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
					organize ideas and information to establish an **overall impression** or point of view in texts	make sure the structure of completed work meets the intentional idea	
Structured Writing	Incorporate particular content features of effective texts into other text; Identify particular content features that enhance the effectiveness of published text	think aloud exemplars - fiction & non-fiction	use Social texts as models	Structured Writing	use paragraph structures to demonstrate unity and coherence	hamburger style, Point Explanation Evidence Link (PEEL)	
	use paragraphs, appropriately, to organize narrative and expository texts	exemplars graphic organizers anchor chart					
Using Evidence	develop, clarify and defend own interpretation, based on evidence from the text with support from own experiences	personal responses paragraph writing	Social blog LA EO that aligns to SS: Develop and use criteria for evaluating the usefulness, currency and reliability of information for a particular research project	Using Evidence	Select the most appropriate information sources for topic, audience, purpose and form	choosing who, what, and why before researching information (using criteria)	*LA EO that aligns to SS* : Develop and use criteria for evaluating the usefulness, currency and reliability of information for a particular research project
Using Feedback	ask questions or make comments that elicit additional information; probe different aspects of ideas, and clarify understanding	class discussions group discussions jigsaw written feedback	Teach & practice during projects				
	listen and view attentively to organize and classify information and to carry out multistep instructions	Kahoot Google Forms					

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Grade 9 Social Studies

Grade 9

Issues for Canadians: Governance and Rights

Students will demonstrate an understanding and appreciation of how Canada's political processes impact citizenship and identity in an attempt to meet the needs of all Canadians.

Values and Attitudes

9.1.1
Appreciate the impact of the Canadian Charter of Rights and Freedoms on rights and governance in Canada (C, I, PADM)

9.1.2
Appreciate the various effects of government policies on citizenship and on Canadian society (C, I, PADM)

9.1.3
Appreciate how emerging issues impact quality of life, citizenship and identity in Canada (C, I, PADM)

Knowledge and Understanding

9.1.4
Examine the structure of Canada's federal political system by exploring and reflecting upon the following questions and issues:

- How are laws passed in the federal political system? (PADM)
- What is the relationship between the executive, legislative and judicial branches of Canada's federal political system? (PADM)
- What processes are used to determine Members of Parliament (MPs) and Senators? (PADM)
- To whom are Members of Parliament and Senators accountable? (PADM, C)
- What is the role of political parties within Canada's federal political system? (PADM, C)
- What is the role of the media in relation to political issues? (PADM, C)
- How do lobby groups impact government decision making? (PADM, C)
- To what extent do political and legislative processes meet the needs of all Canadians? (PADM, C)

9.1.5
Analyze the role that citizens and organizations play in Canada's justice system by exploring and reflecting upon the following questions and issues:

- How do citizens and organizations participate in Canada's justice system (i.e., jury duty, knowing the law, advocacy, John Howard Society, Elizabeth Fry Society)? (C, PADM)
- What are citizens' legal roles and their responsibilities? (C, PADM)
- What is the intention of the Youth Criminal Justice Act? (C, PADM)

Knowledge and Understanding

9.1.6
Assess, critically, the impact of the Canadian Charter of Rights and Freedoms on the legislative process in Canada by exploring and reflecting upon the following questions and issues:

- In what ways has the Canadian Charter of Rights and Freedoms fostered recognition of individual rights in Canada? (PADM, I)
- How does the Canadian Charter of Rights and Freedoms support individuals in exercising their rights? (PADM, C, I)
- In what ways has the Canadian Charter of Rights and Freedoms affected conditions in the workplace (i.e., issues of gender, age, race, religion)? (PADM, I, C)
- What is the relationship between the rights guaranteed in the Canadian Charter of Rights and Freedoms and the responsibilities of Canadian citizens? (PADM, C)

Grade 9
9.1.7 Assess, critically, how the increased demand for recognition of collective rights has impacted the legislative process in Canada by exploring and reflecting upon the following questions and issues: • In what ways has the Canadian Charter of Rights and Freedoms fostered recognition of collective rights in Canada? (PADM, I) • In what ways does the Canadian Charter of Rights and Freedoms meet the needs of Francophones in minority settings? (I, PADM) • To what extent does the Canadian Charter of Rights and Freedoms meet the needs of Francophones in Québec? (PADM, I, C) • To what extent should federal and provincial governments support and promote the rights of official language minorities in Canada? (PADM, I, C) • How does the Indian Act recognize the status and identity of Aboriginal peoples? (PADM, I, C) • How does legislation such as Treaty 6, Treaty 7 and Treaty 8 recognize the status and identity of Aboriginal peoples? (I, PADM, LPP) • How do governments recognize Métis cultures and rights through legislation (i.e., treaties, governance, land claims, Métis Settlements in Alberta)? (PADM, I, CC, LPP)
9.1.8 Assess, critically, how legislative processes attempt to address emerging issues of immigration by exploring and reflecting upon the following questions and issues: • What factors influence immigration policies in Canada (i.e., economic, political, health, security)? (C, ER, PADM) • How are changes to Canadian policies on immigration and refugees a reflection of world issues? (PADM, GC, C, I) • What impact does increasing immigration have on Aboriginal peoples and communities? (C, I, GC, PADM) • How are provincial governments able to influence and implement immigration policies? (PADM, GC) • How is the implementation of immigration policies in Québec an attempt to strengthen the French language in North America? (PADM, GC, C, I)
Knowledge and Understanding
• What is the relationship between immigration policies in Canada and the rights guaranteed in the Canadian Charter of Rights and Freedoms? (I, PADM) • To what extent does Canada benefit from immigration? (GC, PADM)
Skills and Processes For Social Studies
Dimensions of Thinking
9.S.1 Develop skills of critical thinking and creative thinking: • determine the validity of information based on context, bias, source, objectivity, evidence or reliability to broaden understanding of a topic or an issue • evaluate, critically, ideas, information and positions from multiple perspectives • demonstrate the ability to analyze current affairs from multiple perspectives • 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 - assemble and organize different viewpoints in order to assess their validity
9.S.2 Develop skills of historical thinking: • analyze selected issues and problems from the past, placing people and events in a context of time and place • distinguish cause, effect, sequence and correlation in historical events and issues, 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
9.S.3 Develop skills of geographic thinking: • interpret thematic maps to analyze economic and political issues • use geographic tools, such as Geographic Information Systems (GIS) software, to assist in preparing graphs and maps • construct diagrams, charts, graphs and tables to analyze geographic information • define geographic problems and issues and pose geographic questions - access and operate multimedia applications and technologies from stand-alone and online sources (e.g., GIS)

Grade 9
Skills and Processes For Social Studies
Dimensions of Thinking
9.S.4 Demonstrate skills of decision making and problem solving: • take appropriate action and initiative when required in decision-making and problem-solving scenarios • participate in and predict outcomes of problem-solving and decision-making scenarios • propose and apply strategies or options to solve problems and deal with issues • propose and apply new ideas and strategies, supported with facts and reasons, to contribute to problem solving and decision making - 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
Social Participation as a Democratic Practice
9.S.5 Demonstrate skills of cooperation, conflict resolution and consensus building: • demonstrate leadership in groups, where appropriate, to achieve consensus and resolve conflicts peacefully and equitably • demonstrate a positive attitude regarding the needs and perspectives of others - access, retrieve and share information from electronic sources, such as common files - use networks to brainstorm, plan and share ideas with group members
9.S.6 Develop age-appropriate behaviour for social involvement as responsible citizens contributing to their community, such as: • develop leadership skills by assuming specific roles and responsibilities in organizations, projects and events within their community
Research for Deliberative Inquiry
9.S.7 Apply the research process: • reflect on changes of perspective or opinion based on information gathered and research conducted • integrate and synthesize concepts to provide an informed point of view on a research question or an issue • develop a position supported by information gathered during research • draw conclusions based upon research and evidence • determine how information serves a variety of purposes and that the accuracy or relevance may need verification • organize and synthesize researched information • formulate new questions as research progresses • practise responsible and ethical use of information and technology
Research for Deliberative Inquiry
• include and organize references as part of research - create a plan for an inquiry that includes consideration of time management - 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

Communication
9.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 diverse points of view presented in discussions • make reasoned comments relating to the topic of discussion • listen to others to understand their perspectives
9.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, Internet, radio and print media on a particular current affairs issue
Grade 9
Issues for Canadians: Economic Systems in Canada and the United States
Students will demonstrate an understanding and appreciation of how economic decision making in Canada and the United States impacts quality of life, citizenship and identity.
Values and Attitudes
9.2.1 Appreciate the values underlying economic decision making in Canada and the United States (C, ER)
9.2.2 Appreciate the relationship between consumerism and quality of life (C, CC)
9.2.3 Appreciate the impact of government decision making on quality of life (C, CC, PADM)
Knowledge and Understanding
9.2.4 Compare and contrast the principles and practices of market and mixed economies by exploring and reflecting upon the following questions and issues: • What are the principles of a market economy? (ER) • Why do governments intervene in a market economy? (ER, PADM) • Why is Canada viewed as having a mixed economy? (ER, PADM) • What is the role of the consumer in market and mixed economies? (ER) • To what extent do consumer actions reflect individual and collective identity? (ER, I) • How has the emergence of labour unions impacted market and mixed economies? (ER) • What are some similarities and differences in the way governments in Canada and the United States intervene in the market economies? (ER, PADM, GC) • How do the economic systems of Canada and the United States differ in answering the basic economic question of scarcity? (ER, PADM, GC)
9.2.5 Assess, critically, the relationship between consumerism and quality of life in Canada and the United States by exploring and reflecting upon the following questions and issues: • What are the indicators of quality of life? (PADM, ER) • How does individual consumer behaviour impact quality of life (e.g., environmental issues)? (PADM, ER) • How does marketing impact consumerism? (ER) • How does consumerism provide opportunities for and limitations on impacting quality of life? (PADM, ER) • How is consumerism used as a power of a collective (e.g., boycotts)? (ER, PADM, C) • To what extent do perspectives regarding consumerism, economic growth and quality of life differ regionally in North America? (PADM, ER, GC, I)

Grade 9
Knowledge and Understanding
• What societal values underlie social programs in Canada and the United States? (PADM, ER, GC, I)
9.2.6 Assess, critically, the interrelationship between political decisions and economic systems by exploring and reflecting upon the following questions and issues: • How do the economic platforms of political parties differ from one another (i.e., Democrat versus Republican; Liberal versus Conservative)? (ER, PADM) • How is a political party's philosophy reflected in its platform (i.e., social programs, specific taxes, taxation model)? (ER, PADM) • How does the underground economy impact the federal and provincial tax base and social programs (i.e., tax evasion, black market)? (ER, PADM, C) • How do government decisions on environmental issues impact quality of life (i.e., preservation, exploitation and trade of natural resources)? (PADM, ER)
Skills and Processes For Social Studies
Dimensions of Thinking
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Grade 9
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GR 7 - 9 Mathematics

Grade 7				Grade 8				Grade 9
Big Ideas	**Number (combined 75%)**	**Essential Skills**	**Essential Vocabulary**	**Big Ideas**	**Number (combined 75%)**	**Essential Skills**	**Essential Vocabulary**	**Number**
	General Outcome: Develop Number Sense				**General Outcome: Develop Number Sense**			**General Outcome: Develop Number Sense**
	Specific Outcomes				Specific Outcomes			Specific Outcomes
Properties-for a given set of numbers there are relationships that are always true, and these are the rules that govern arithmetic and algebra.	1. Determine and explain why a number is divisible by 2, 3, 4, 5, 6, 8, 9 or 10, and why a number cannot be divided by 0. [C, R]	1. Decimal operations 2. Estimate sums, differences, quotients and products 3.Addition and subtraction of fractions including mixed and improper 4. Factors for simplifying fractions (multiplication skills) 5. Addition and subtraction of integers 6. Relating fractions, decimals and percents to on another to develop number sense	Decimals Denominator Difference Divisible Equivalent Estimate Factor (GCF) Groups of Multiples (LCM) Negative Numerator Parts and Wholes Percent Positive Product Quotient Rational Numbers Sum	Properties-for a given set of numbers there are relationships that are always true, and these are the rules that govern arithmetic and algebra. Relations-mathematical rules (relations) can be used to assign members of one set to members of another set.	1. Demonstrate an understanding of perfect squares and square roots, concretely, pictorially and symbolically (limited to whole numbers). [C, CN, R, V]	1. Visual of a square and square roots without a calculator 2. Understanding area as an array 3 All operations of fractions including mixed and improper 4. Factors for simplifying fractions (multiplication skills) 5. All operations of integers	Approximate Area Denominator Difference Equivalent Estimate Integer Numerator Part Perfect Square Product Proportion Quotient Rate Ratio Rational Side Length Square Square Root Sum Whole	1. Demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by [C, CN, PS, R] • representing repeated multiplication, using powers • using patterns to show that a power with an exponent of zero is equal to one • solving problems involving powers.
Basic Facts and Algorithms-basic facts and algorithms for operations with rational numbers use notions of equivalence to transform claculations into simplier ones.	2. Demonstrate an understanding of the addition, subtraction, multiplication and division of decimals to solve problems (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected). [ME, PS, T] [ICT: P2–3.4]			Estimation-numerical calculations can be approximated by replacing numbers with other numbers that are closer and easy to compute with mentally. Basic facts and Algorithms-basic facts and algorithms for operations with rational numbers use notions of equivalence to transform calculations into simplier ones.	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]			2. Demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole number exponents: C, CN, PS, R, T] [ICT: P2–3.4] • $(a^s)(a^n) = a^{s+n}$ • $a^s / a^n = a^{s-n}$, s > n • $(a^s)^n = a^{sn}$ • $(ab)^n = a^n + b^n$ • $(a/b)^n = a^n/b^n$, b ≠ 0
Properties-for a given set of numbers there are relationships that are always true, and these are the	3. Solve problems involving percents from 1% to 100%. [C, CN, PS, R, T] [ICT: P2–3.4]			Proportionality-proportional thinking that involves the use of multiplicative relationships to solve	3. Demonstrate an understanding of percents greater than or equal to 0%, including greater than 100%. [CN, PS, R, V]			3. Demonstrate an understanding of rational numbers by: [C, CN, PS, R, T, V] [ICT: P2–3.4] • comparing and ordering rational numbers • solving problems that involve arithmetic operations on rational numbers.
Properties-for a given set of numbers there are relationships that are always true, and these are the rules that govern arithmetic and algebra.	4. Demonstrate an understanding of the relationship between positive terminating decimals and positive fractions and between positive repeating decimals and positive fractions. [C, CN, R, T] [ICT: P2–3.4]			Proportionality-proportional thinking that involves the use of multiplicative relationships to solve problems.	4. Demonstrate an understanding of ratio and rate. [C, CN, V]			
Basic Facts and Algorithms-basic facts and algorithms for operations with rational numbers use notions of equivalence to transform claculations into simplier ones.	5. Demonstrate an understanding of adding and subtracting positive fractions and mixed numbers, with like and unlike denominators, concretely, pictorially and symbolically (limited to positive sums and differences). [C, CN, ME, PS, R, V]			Basic Facts and Algorithms-basic facts and algorithms for operations with rational numbers use notions of equivalence to transform claculations into simplier ones.	5. Solve problems that involve rates, ratios and proportional reasoning. [C, CN, PS, R]			4. Explain and apply the order of operations, including exponents, with and without technology. [PS, T] [ICT: P2–3.4]
Basic Facts and Algorithms-basic facts and algorithms for operations with rational numbers use notions of equivalence to transform claculations into simplier ones.	6. Demonstrate an understanding of addition and subtraction of integers, concretely, pictorially and symbolically. [C, CN, PS, R, V]			Basic Facts and Algorithms-basic facts and algorithms for operations with rational numbers use notions of equivalence to transform claculations into simplier ones.	6. Demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially and symbolically. [C, CN, ME, PS]			5. Determine the square root of positive rational numbers that are perfect squares. [C, CN, PS, R, T] [ICT: P2–3.4]
The Base Ten Numeration System-the base ten numeration system is a scheme for recording numbers using digits 0-9, place value	7. Compare and order positive fractions, positive decimals (to thousandths) and whole numbers by using: [CN, R, V] • benchmarks • place value				7. Demonstrate an understanding of multiplication and division of integers, concretely, pictorially and symbolically. [C, CN, PS, R, V]			6. Determine an approximate square root of positive rational numbers that are non-perfect squares. [C, CN, PS, R, T] [ICT: P2–3.4]
Comparision-numbers, expressions and measures can be compared by their relative values.								
Equilavence-any number, measure, numerical expression, algebraic expression or equation can be represents in an infinite number of ways that have the same value.								

Grade 7				Grade 8				Grade 9
Big Ideas	**Pattern and Relations (combined 75%)**	**Essential Skills**	**Essential Vocabulary**	**Big Ideas**	**Patterns and Relations (combined 75%)**	**Essential Skills**	**Essential Vocabulary**	**Patterns and Relations**
	General Outcome (Patterns): Use patterns to describe the world and to solve problems.				**General Outcome (Patterns): Use patterns to describe the world and to solve problems.**			**General Outcome (Patterns): Use patterns to describe the world and to solve problems.**
Specific Outcomes	Specific Outcomes				Specific Outcomes			Specific Outcomes
Patterns-relationships can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways.	1. Demonstrate an understanding of oral and written patterns and their equivalent linear relations. [C, CN, R]	1. Creating a table of values 2. Moving between tables of values and graphs and linear relations 3. Solving one and two step equations 4. Simplifying expressions 5. Plotting ordered pairs correctly on a cartesian plane	Balance Coefficient Constant Equation Expression Graph Horizontal Input Output Inverse Linear Relation Opposite Operation Ordered Pairs Output Preservation of Equality Simplify Substitute Table of Values Variable Vertical X-axis Y-axis Zero Pair	Patterns-relationships can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways.	1. Graph and analyze two-variable linear relations. [C, ME, PS, R, T,, V] [ICT: P2–3.3]	1. Creating a table of values 2. Moving between tables of values and graphs and linear relations 3. Solving one and two step equations 4. Simplifying expressions 5. Plotting ordered pairs correctly on a Cartesian Plane 6. Using the distributive property and combining like terms to simplify an expression 7. Solving word problems (single and multi-step equations)	Balance Coefficient Combining Constant Distributive Property Equation Expression Graph Horizontal Input Inverse Isolate Like Terms Linear Relation Opposite Operation Ordered Pairs Output Preservation of Equality Simplify Substitute Table of Values Variable Vertical X-axis Y-axis Zero Pair	1. Generalize a pattern arising from a problem-solving context, using a linear equation, and verify by substitution. [C, CN, PS, R, V]
Patterns-relationships can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways.	2. Create a table of values from a linear relation, graph the table of values, and analyze the graph to draw conclusions and solve problems. [C, CN, PS, R, V] [ICT: C7–3.1]							2. Graph a linear relation, analyze the graph, and interpolate or extrapolate to solve problems. [C, CN, PS, R, T, V] [ICT: C7–3.1, P2–3.3]
	General Outcome (Variables and Equations): Represent algebraic expressions in multiple ways.				**General Outcome (Variables and Equations): Represent algebraic expressions in multiple ways.**			**General Outcome (Variables and Equations): Represent algebraic expressions in multiple ways.**
	Specific Outcomes				Specific Outcomes			Specific Outcomes
Equations and Inequalities-rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalitites so solutions can be found.	3. Demonstrate an understanding of preservation of equality by: [C, CN, PS, R, V] • modelling preservation of equality, concretely, pictorially and symbolically • applying preservation of equality to solve equations.			Variable-mathematical situations and structures can be translated and represented abstractly using variables, expressions and equations.	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 •x/a +b = c, a ≠ 0 • a(x + b) = c where a, b and c are integers. [C, CN, PS, V]			3. Model and solve problems, using linear equations of the form: where a, b, c, d, e and f are rational numbers. [C, CN, PS, V] • ax = b • x/a = b , a ≠ 0 • ax + b = c • x/a +b = c , a ≠ 0 • ax = b + cx • a(x + b) = c • ax + b = cx + d • a(bx + c) = d(ex + f) • a/x =b , x ≠ 0
Variable-mathematical situations and structures can be translated and represented abstractly using variables, expressions and	4. Explain the difference between an expression and an equation. [C, CN]							
Variable-mathematical situations and structures can be translated and represented abstractly using variables, expressions and	5. Evaluate an expression, given the value of the variable(s). [CN, R]							4. Explain and illustrate strategies to solve single variable linear inequalities with rational coefficients within a problem-solving context. [C, CN, PS, R, V]
Variable-mathematical situations and structures can be translated and represented abstractly using variables, expressions and	6. Model and solve, concretely, pictorially and symbolically, problems that can be represented by one-step linear equations of the form x + a = b, where a and b are integers. [CN, PS, R, V]							5. Demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to 2). [C, CN, PS, R, V]
	7. Model and solve, concretely, pictorially and symbolically, problems that can be represented by linear equations of the form: • *ax + b = c*							6. Model, record and explain the operations of addition and subtraction of polynomial expressions, concretely, pictorially and symbolically (limited to polynomials of degree less than or equal to 2). [C, CN, PS, R, V]
								7. Model, record and explain the operations of multiplication and division of polynomial expressions (limited to polynomials of degree less than or equal to 2) by monomials, concretely, pictorially and symbolically. [C, CN, R, V]

Grade 7				Grade 8				Grade 9
Big Ideas	**Shape and Space (20%)**	**Essential Skills**	**Essential Vocabulary**	**Big Ideas**	**Shape and Space (approx. 20%)**	**Essential Skills**	**Essential Vocabulary**	**Shape and Space**
	General Outcome (Measurement): Use direct and indirect measurement to solve problems.				**General Outcome (Measurement): Use direct and indirect measurement to solve problems.**			**General Outcome (Measurement): Use direct and indirect measurement to solve problems.**
	Specific Outcomes				Specific Outcomes			Specific Outcomes
Shapes and Solids-two and three dimentional shapes/objects with and without curved surfaces can be described, classified, and analyzed by their attributes.	1. Demonstrate an understanding of circles by: [C, CN, PS, R, V]	1. Area of triangles, parallelograms, circles 2. Circumference of circles 3. Solving problems involving area and circumference 4. Applying formulas for solving area and circumference 5. Determine radius when given diameter or vice versa	Area Base Circumference Diameter Height Parallel Parallelogram Perimeter Pi Radius Right Angle Squared Width	Proof-mathematical statements can be proved or disproved using previously established statements. This may be through the use of physical objects, diagrams, maniplatives, or algebra. Geometry-fundamental to geometry, the theorum can be used to prove a number of other theorums/derive equations.	1. Develop and apply the Pythagorean theorem to solve problems. [CN, PS, R, T, V] [ICT: P2–3.4]	1. Using Pythagorean Theorem to solve problems 2. Constructing nets 3. Solve problems involving the Surface Area of prisms and cylinders 4. Manipulate a formula for any given variable and apply it solve problems 5. Solve problems involving volume of prisms and cylinders 6. Difference between surface area and Volume	2 Dimensional (2D) 3 Dimensional (3D) Circumference Cubed Units Cylinder Hypotenuse Isolate the Variable Leg Net Pi Pyramid Pythagorean Theorem Rectangular Prism Right ANgle Square Square Root Squared Units Substitution Surface Area Triangular Prism Volume	1. Solve problems and justify the solution strategy, using the following circle properties: [C, CN, PS, R, T, V] [ICT: C6–3.1, C6–3.4] • the perpendicular from the centre of a circle to a chord bisects the chord • the measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc • the inscribed angles subtended by the same arc are congruent • a tangent to a circle is perpendicular to the radius at the point of tangency.
Measurement-attributes of shapes/objects are measureable and can be quantified using unit amounts.	• describing the relationships among radius, diameter and circumference • relating circumference to pi • determining the sum of the central angles • constructing circles with a given radius or diameter • solving problems involving the radii, diameters and circumferences of circles.			Construction-pure form of geometric construction: no numbers	2. Draw and construct nets for 3D objects. [C, CN, PS, V]			
Measurement-attributes of shapes/objects are measureable and can be quantified using unit amounts.	2. Develop and apply a formula for determining the area of: [CN, PS, R, V] • triangles • parallelograms • circles			Measurement-attributes of shapes/objects are measureable and can be quantified using unit amounts.	3. Determine the surface area of: [C, CN, PS, R, V] • right rectangular prisms • right triangular prisms • right cylinders to solve problems			
				Measurement-attributes of shapes/objects are measureable and can be quantified using unit amounts.	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 (3D Objects and 2D Shapes): Describe the characteristics of 3-D objects and 2D shapes, and analyze the relationships among them.				**General Outcome (3D Objects and 2D Shapes): Describe the characteristics of 3-D objects and 2D shapes, and analyze the relationships among them.**			**General Outcome (3D Objects and 2D Shapes): Describe the characteristics of 3-D objects and 2D shapes, and analyze the relationships among them.**
	Specific Outcomes				Specific Outcomes			Specific Outcomes
Construction-pure form of geometric construction: no numbers	3. Perform geometric constructions, including: [CN, R, V] • perpendicular line segments • parallel line segments • perpendicular bisectors • angle bisectors			Shapes and Solids-two and three dimentional shapes/objects with or without curved surfaces can be described, classified, and analyzed by their attributes.	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]			2. Determine the surface area of composite 3-D objects to solve problems. [C, CN, PS, R, V]
								3. Demonstrate an understanding of similarity of polygons. [C, CN, PS, R, V]
	General Outcome (Transformations): Describe and analyze position and motion of objects and shapes.				**General Outcome (Transformations): Describe and analyze position and motion of objects and shapes.**			**General Outcome (Transformations): Describe and analyze position and motion of objects and shapes.**
	Specific Outcomes				Specific Outcomes			Specific Outcomes
Every line in the x-y plane has its own unique equation-every point on that line satisfies the equation of the line.	4. Identify and plot points in the four quadrants of a Cartesian plane, using integral ordered pairs. [C, CN, V]			Measurement-attributes of shapes/objects are measureable and can be quantified using unit amounts.	6. Demonstrate an understanding of the congruence of polygons. [CN, R, V]			4. Draw and interpret scale diagrams of 2-D shapes. [CN, R, T, V] [ICT: C6–3.4]
	5. Perform and describe transformations (translations, rotations or reflections) of a 2-D shape in all four quadrants of a Cartesian plane (limited to integral number vertices).							5. Demonstrate an understanding of line and rotation symmetry. [C, CN, PS, V]

Grade 7				Grade 8				Grade 9
Big Ideas	**Statistics and Probability (5%)**	**Essential Skills**	**Essential Vocabulary**	**Big Ideas**	**Statistics and Probability (5%)**	**Essential Skills**	**Essential Vocabulary**	**Statistics and Probability**
	General Outcome (Data Analysis): Collect, display and analyze data to solve problems.				**General Outcome (Data Analysis): Collect, display and analyze data to solve problems.**			**General Outcome (Data Analysis): Collect, display and analyze data to solve problems.**
	Specific Outcomes				Specific Outcomes			Specific Outcomes
Data Distribution-there are special numerical measures that describe the centre and spread of numerical data sets. Data Distribution-there are special numerical measures that describe the centre and spread of numerical data sets.	1. Demonstrate an understanding of central tendency and range by: [C, PS, R, T] [ICT: P2–3.4] • determining the measures of central tendency (mean, median, mode) and range • determining the most appropriate measures of central tendency to report findings	1. Graphically organize probability data 2. Knowing the difference between mean, median, mode 3. Select the most appropriate measure of central tendency 4. Understanding how outliers impact data	Experimental Probability Independent Event Mean Median Mode Outlier Possible Outcome Range Sample Space Theoretical Probability	Data Representation-data can be represented visually using tables, charts and graphs. The type of data determines the best choice of visual	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]	1. Critique different types of graphs for bias	Bar Graph Bias Circle Graph Line Graph Pictograph Proportionally Scale	1. Describe the effect of: • bias • use of language • ethics • cost • time and timing • privacy • cultural sensitivity on the collection of data. [C, CN, R, T] [ICT: F4–3.2, F4–3.3]
Data Representation-data can be represented visually using tables, charts and graphs. The type of data determines the best choice of visual representation.	2. Determine the effect on the mean, median and mode when an outlier is included in a data set. [C, CN, PS, R]				**General Outcome (Chance and Uncertainty): Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.**			
	3. Construct, label and interpret circle graphs to solve problems. [C, CN, PS, R, T, V] [ICT: P2–3.3]				Specific Outcomes			2. Select and defend the choice of using either a population or a sample of a population to answer a question. [C, CN, PS, R]
	General Outcome (Chance and Uncertainty): Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.			Chance-the chance of an event occuring can be described numerically by a number between 0 and 1 inclusive and used to make predictions about other events.	2. Solve problems involving the probability of independent events. [C, CN, PS, T] [ICT: P2–3.4]			3. Develop and implement a project plan for the collection, display and analysis of data by: • formulating a question for investigation • choosing a data collection method that includes social considerations • selecting a population or a sample • collecting the data • displaying the collected data in an appropriate manner • drawing conclusions to answer the question. [C, PS, R, T, V] [ICT: C1–3.5, C4–3.1, C6–3.1, C6–3.2, C7–3.1, C7–3.2, P1–3.4, P2–3.1]
	Specific Outcomes							**General Outcome (Chance and Uncertainty): Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.**
Comparision-numbers, expressions and measures can be compared by their relative values.	4. Express probabilities as ratios, fractions and percents. [C, CN, R, T, V] [ICT: P2–3.4]							Specific Outcomes
Comparision-numbers, expressions and measures can be compared by their relative values. Chance-the chance of an event occuring can be described numerically by a number between 0 and 1 inclusive and used to make predictions about other events.	5. Identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving two independent events. [C, ME, PS]							
	6. Conduct a probability experiment to compare the theoretical probability (determined using a tree diagram, table or other graphic organizer) and experimental probability of two independent events. [C, PS, R, T] [ICT: C7–3.2, P2–3.4]							4. Demonstrate an understanding of the role of probability in society. [C, CN, R, T] [ICT: F4–3.3]

GR 7 - 9 Science

Grade 7			Grade 8			Grade 9
Unit A: Interactions and Ecosystems			**Unit A: Mix and Flow of Matter**			**Unit A: Biological Diversity**
Outcomes for Science, Technology and Society	**Essential Vocabulary**	**Math Connection**	**Outcomes for Science, Technology and Society**	**Essential Vocabulary**	**Math Connection**	**Outcomes for Science, Technology and Society**
1. Investigate and describe relationships between humans and their environments, and identify related issues and scientific questions	**Student** Abiotic Bioaccumulation Biotic Carbon Cycle Consumer Decomposer Dependencies Ecosystems Energy Flow Intended Interactions Interdependencies Nutrient Cycle Producer Sustainability Unintended Water Cycle **Teacher** Analyze Interpret Investigate		1. Investigate and describe fluids used in technological devices and everyday materials	Concentration Controlled Variable Density Flow Rate Fluid Manipulated Variable Mass Matter Mixtures Particle Theory of Matter Pressure Pure Substances Responding Variable Solubility Solute Solution Solvent Viscosity Volume WHMIS	• Formula Manipulation • Intro to Surface Area and Volume Graphing • Rates • Ratios	1. Investigate and interpret diversity among species and within species, and describe how diversity contributes to species survival
• illustrate how life-supporting environments meet the needs of living things for nutrients, energy sources, moisture, suitable habitat, and exchange of gases			• investigate and identify examples of fluids in household materials, technological devices, living things and natural environments			• observe variation in living things, and describe examples of variation among species and within species (e.g., observe and describe characteristics that distinguish two closely related species)
• describe examples of interaction and interdependency within an ecosystem (e.g., identify examples of dependency between species, and describe adaptations involved; identify changing relationships between humans and their environments, over time and in different cultures—as, for example, in aboriginal cultures)			• 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			• identify examples of niches, and describe the role of variation in enabling closely related living things to survive in the same ecosystem (e.g., investigate different bird species found in a local park ecosystem, and infer how each is adapted to life within that ecosystem)
• identify examples of human impacts on ecosystems, and investigate and analyze the link between these impacts and the human wants and needs that give rise to them (e.g., identify impacts of the use of plants and animals as sources of food, fibre and other materials; identify potential impacts of waste products on environments)			• 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)			• investigate and interpret dependencies among species that link the survival of one species to the survival of others – identify examples of symbiotic relationships (e.g., organisms that benefit other organisms by providing habitat, food, means of fertilization, or a source of oxygen) – classify symbiotic relationships as mutualism, commensalism, parasitism
• analyze personal and public decisions that involve consideration of environmental impacts, and identify needs for scientific knowledge that can inform those decisions			• identify properties of fluids that are important in their selection and use (e.g., lubricant properties of oils, compressibility of gases used in tires)			• identify the role of variation in species survival under changing environmental conditions (e.g., resistance to disease, ability to survive in severe environments)
2. Trace and interpret the flow of energy and materials within an ecosystem			2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution			2. Investigate the nature of reproductive processes and their role in transmitting species characteristics
• analyze an ecosystem to identify biotic and abiotic components, and describe interactions among these components • analyze ecosystems to identify producers, consumers and decomposers; and describe how energy is supplied to and flows through a food web, by: – describing and giving examples of energy and nutrient storage in plants and animals – describing how matter is recycled in an ecosystem through interactions among plants, animals, fungi, bacteria and other microorganisms – interpreting food webs, and predicting the effects of changes to any part of a web • describe the process of cycling carbon and water through an ecosystem • identify mechanisms by which pollutants enter and move through the environment, and can become concentrated in some organisms (e.g., acid rain, mercury, PCBs, DDT			• distinguish among pure substances, mixtures and solutions, using common examples (e.g., identify examples found in households) • investigate the solubility of different materials, and describe their concentration (e.g., describe concentration in grams of solute per 100 mL of solution) • 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)			• distinguish between sexual and asexual reproduction, and identify and interpret examples of asexual and sexual reproduction in different species, by: – describing mechanisms of asexual reproduction including binary fission, budding and the production of spores – describing mechanisms of sexual reproduction (e.g., cross-fertilization in seed plants, sexual reproduction in mammals) – describing examples of organisms that show both sexual and asexual reproduction (e.g., yeasts that reproduce both by budding and sexual reproduction; plants that reproduce through suckering, runners or bulbs, as well as by seed production) – describing the formation of zygote and embryo in plant and animal reproduction
						• describe examples of variation of characteristics within a species, and identify examples of both discrete and continuous variation (e.g., hand clasping preference is an example of a discrete variation, the length of human hands varies on a continuum) • investigate the transmission of characteristics from parents to offspring, and identify examples of characteristics in offspring that are: – the same as the characteristics of both parents – the same as the characteristics of one parent – intermediate between parent characteristics – different from both parents
						• distinguish those characteristics that are heritable from those that are not heritable, and identify characteristics for which heredity and environment may both play a role (e.g., recognize that eye colour is heritable but that scars are not; recognize that a person's height and weight may be largely determined by heredity but that diet may also play a role)
						• identify examples of dominant and recessive characteristics and recognize that dominance and recessiveness provide only a partial explanation for the variation of characteristics in offspring

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3. Monitor a local environment, and assess the impacts of environmental factors on the growth, health and reproduction of organisms in that environment	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	3. Describe, in general terms, the role of genetic materials in the continuity and variation of species characteristics; and investigate and interpret related technologies
• investigate a variety of habitats, and describe and interpret distribution patterns of living things found in those habitats (e.g., describe and compare two areas within the school grounds—a relatively undisturbed site and a site that has been affected by heavy use; describe and compare a wetland and a dryland area in a local parkland)	• 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.]	• describe, in general terms, the role and relationship of chromosomes, genes and DNA
• investigate and interpret evidence of interaction and change (e.g., population fluctuations, changes in weather, availability of food or introduction of new species into an ecosystem)	• compare densities of materials; and explain differences in the density of solids, liquids and gases, using the particle model of matter	• distinguish between cell division that leads to identical daughter cells, as in binary fission and mitosis, and cell division that leads to formation of sex cells, as in meiosis; and describe, in general terms, the synthesis of genetic materials that takes place during fertilization [Note: At this level, students should understand that the formation of sex cells involves the halving of the parent cell's genetic materials and that this process leads to zygote formation. Opportunity for further study of the specific stages of cell division will be provided in senior high school courses (e.g., prophase, metaphase, anaphase, telophase).]
• identify signs of ecological succession in local ecosystems (e.g., emergence of fireweed in recently cut forest areas, replacement of poplar by spruce in maturing forests, reestablishment of native plants on unused farmland)	• 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)	• compare sexual and asexual reproduction, in terms of the advantages and disadvantages (e.g., recognize that asexual reproduction provides an efficient means of transmitting characteristics and that sexual reproduction provides an opportunity for recombination of characteristics)
	• 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)	• distinguish between, and identify examples of, natural and artificial selection (e.g., evolution of beak shapes in birds, development of high milk production in dairy cows)
	• investigate and compare the compressibility of liquids and gases	• describe, in simple terms, some genetic technologies (e.g., cloning and genetic engineering); and identify questions and issues related to their application
4. Describe the relationships among knowledge, decisions and actions in maintaining life-supporting environments	4. Identify, interpret and apply technologies based on properties of fluids	4. Identify impacts of human action on species survival and variation within species, and analyze related issues for personal and public decision making
• identify intended and unintended consequences of human activities within local and global environments (e.g., changes resulting from habitat loss, pest control or from introduction of new species; changes leading to species extinction)	• describe technologies based on the solubility of materials (e.g., mining salt or potash by dissolving)	• describe the relative abundance of species on Earth and in different environments (e.g., note the overall abundance of insect species; note that in harsh environments there are relatively fewer species found than in temperate and tropical environments)
• describe and interpret examples of scientific investigations that serve to inform environmental decision making	• 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 ongoing changes in biological diversity through extinction and extirpation of native species, and investigate the role of environmental factors in causing these changes (e.g., investigate the effect of changing river characteristics on the variety of species living in the river; investigate the effect of changing land use on the survival of wolf or grizzly bear populations)
• illustrate, through examples, the limits of scientific and technological knowledge in making decisions about life-supporting environments (e.g., identify limits in scientific knowledge of the impact of changing land use on individual species; describe examples in which aboriginal knowledge—based on long-term observation—provides an alternative source of understanding)	• describe and interpret technologies for moving fluids from one place to another (e.g., intravenous lines, pumps and valves, oil and gas pipelines)	• evaluate the success and limitations of various local and global strategies for minimizing loss of species diversity (e.g., breeding of endangered populations in zoos, development of seed banks, designating protected areas, development of international treaties regulating trade of protected species and animal parts)
• analyze a local environmental issue or problem based on evidence from a variety of sources, and identify possible actions and consequences (e.g., analyze a local issue on the control of the beaver population in a nearby wetland, and identify possible consequences)	• 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)	• investigate and describe the use of biotechnology in environmental, agricultural or forest management; and identify potential impacts and issues (e.g., investigate issues related to the development of patented crop varieties and varieties that require extensive chemical treatments; identify issues related to selective breeding in game farming and in the rearing of fish stocks)
Specific Outcomes for Skills	**Specific Outcomes for Skills**	**Specific Outcomes for Skills**
Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions
• identify science-related issues (e.g., identify a specific issue regarding human impacts on environments)	• define practical problems (e.g., How can we remove a salt coating from a bicycle or vehicle?)	• identify science-related issues (e.g., identify issues related to loss of species diversity)
• identify questions to investigate arising from practical problems and issues (e.g., identify questions, such as: "What effects would an urban or industrial development have on a nearby forest or farming community?")	• 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?")	• identify questions to investigate arising from science-related issues (e.g., "What factors affect the ability of organisms to survive and reproduce in this ecosystem?")
• state a prediction and a hypothesis based on background information or an observed pattern of events (e.g., predict changes in the population of an organism if factor X were increased, or if a species were introduced or removed from the ecosystem; propose factors that will affect the population of a given animal species)	• 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 23ºC?")	• state a prediction and a hypothesis based on background information or an observed pattern of events (e.g., predict changes to an area of local parkland that is subject to intense use; hypothesize means of impact, such as soil compaction and disturbance of nest sites)

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• select appropriate methods and tools for collecting data and information (e.g., select or develop a method for estimating a plant population within a given study plot; design a survey as a first step in investigating an environmental issue)	• design an experiment, and identify the major variables (e.g., design or apply a procedure for measuring the solubility of different materials)	• define and delimit questions and problems to facilitate investigation (e.g., delimit an electronic search for information on species survival by framing a question about a specific group of organisms or a specific ecosystem)
Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and	Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and	Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather
• research information relevant to a given problem or issue	• carry out procedures, controlling the major variables (e.g., carry out a test of the viscosity of different fluids)	• observe and record data, and prepare simple line drawings (e.g., compare two related plants by measuring, describing and drawing them)
• select and integrate information from various print and electronic sources or from several parts of the same source (e.g., compile information on a global environmental issue from books, magazines, pamphlets and Internet sites, as well as from conversations with experts)	• use instruments effectively and accurately for collecting data (e.g., measure the mass and volume of a given sample of liquid)	• estimate measurements (e.g., estimate the population of a given plant species within a study plot)
• use tools and apparatus effectively and accurately for collecting data (e.g., measure factors, such as temperature, moisture, light, shelter and potential sources of food, that might affect the survival and distribution of different organisms within a local environment)	• construct and test prototype designs and systems (e.g., construct a model submarine that is controlled by an air hose connected to a syringe) • use tools and apparatus safely (e.g., wear safety goggles during investigations of solution properties)	• research information related to a given issue (e.g., conduct an electronic search for information on factors that affect the reproduction and survival of wood frogs)
• estimate measurements (e.g., estimate the population of a given plant in a one square metre quadrat, and use this figure to estimate the population within an area of 100 square metres)	• 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 Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations	Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations	Analyzing and Interpreting Students will: 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 two different approaches to measuring the amount of moisture in an environment; analyze information presented by proponents on two sides of an environmental issue)	• 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)	• identify strengths and weaknesses of different ways of displaying data (e.g., compare different ways of recording and displaying data on plant variation in a study plot)
• 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., illustrate a food web, based on observations made within a given environment)	• 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)	• interpret patterns and trends in data, and infer and explain relationships among the variables (e.g., interpret data on changing animal populations, and infer possible causes)
• classify organisms found in a study plot	• 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?”)	• apply given criteria for evaluating evidence and sources of information (e.g., evaluate sources based on their currency, credibility and the extent to which claims are supported by data)
	• identify and evaluate potential applications of findings	• identify new questions and problems that arise from what was learned
Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results
• 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., present findings from an analysis of a local issue, such as the control of the beaver population in a nearby wetland)	• 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)	• 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., illustrate and compare methods of reproduction in sample organisms studied)
• evaluate individual and group processes used in planning, problem solving, decision making and completing a task	• work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise	• evaluate individual and group processes used in investigating an issue and evaluating alternative decisions (e.g., evaluate strategies for locating information, such as the use of particular key words or search tools; evaluate approaches for sharing work on a given research task and for synthesizing the information found)
• defend a given position on an issue, based on their findings (e.g., make a case for or against on an issue, such as: “Should a natural gas plant be located near a farming community?”)	• 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)	• defend a given position on an issue, based on their findings (e.g., defend a position on a proposed measure to protect a particular plant or animal population)
Specific Outcomes for Attitudes	**Specific Outcomes for Attitudes**	**Specific Outcomes for Attitudes**
Interest in Science Students will be encouraged to: Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., take an interest in media reports on environmental issues, and seek out further information; express an interest in conducting scientific investigations of their own design; develop an interest in careers related to environmental sciences)	Interest in Science Students will be encouraged to: 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)	Interest in Science Students will be encouraged to: Show interest in science-related questions and issues, and confidently pursue personal interests and career possibilities within science-related fields (e.g., select and explore media on topics related to species diversity; express interest in hobbies and careers that involve the care, culture and study of living things)

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Mutual Respect Students will be encouraged to: 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)	Mutual Respect Students will be encouraged to: 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)	Mutual Respect Students will be encouraged to: Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., show awareness that the scientific study of changing animal and plant populations can arise from a variety of global needs, involving many individuals and organizations)
Scientific Inquiry Students will be encouraged to: Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., take the time to accurately gather evidence and use instruments carefully; consider observations, ideas and perspectives from a number of sources during investigations and before drawing conclusions and making decisions)	Scientific Inquiry Students will be encouraged to: 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)	Scientific Inquiry Students will be encouraged to: Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., strive to assess a problem accurately by careful analysis of evidence gathered; critically consider ideas and perceptions, recognizing that the obvious is not always right)
Collaboration Students will be encouraged to: Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., consider alternative ideas, perspectives and approaches suggested by members of the group; share the responsibility for carrying out decisions)	Collaboration Students will be encouraged to: 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)	Collaboration Students will be encouraged to: 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; accept various roles within a group, including that of leader)
Stewardship Students will be encouraged to: Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., assume personal responsibility for their impact on the environment; predict consequences of proposed personal actions on the environment; consider both immediate and long-term consequences of group actions; identify, objectively, potential conflicts between responding to human wants and needs and protecting the environment)	Stewardship Students will be encouraged to: 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)	Stewardship Students will be encouraged to: Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., consider implications of changing land use on the welfare and survival of living things; identify potential conflicts between attempting to meet the wants and needs of humans and, at the same time, providing life-supporting environments for all living things; minimize environmental impact during studies by avoiding sampling that will affect an animal or plant population)
Safety Students will be encouraged to: Show concern for safety in planning, carrying out and reviewing activities (e.g., select safe methods and tools for collecting evidence and solving problems; assume personal responsibility for their involvement in a breach of safety or in waste disposal procedures)	Safety Students will be encouraged to: 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)	Safety Students will be encouraged to: Show concern for safety in planning, carrying out and reviewing activities (e.g., follow safety procedures in outdoor investigations)

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Unit B: Plants for Food and Fibre			Unit B: Cells and Systems			Unit B: Matter and Chemical Change
Specific Outcomes for Science, Technology and Society	**Essential Vocabulary**	**Math Connection**	**Specific Outcomes for Science, Technology and Society**	**Essential Vocabulary**	**Math Connection**	**Outcomes for Science, Technology and Society**
1. Investigate plant uses; and identify links among needs, technologies, products and impacts	Diffusion Flowers Leaves Osmosis Photsynthesis Stems Sustainable Transpiration		1. Investigate living things; and identify and apply scientific ideas used to interpret their general structure, function and organization	Animal Cell Cell Circulatory System Digestive System Diffusion Excretory System Nervous System Organ Organelles Organism Osmosis Parts of the Microscope Plant Cell Respiratory System System Tissue		1. Investigate materials, and describe them in terms of their physical and chemical properties
• illustrate and explain the essential role of plants within the environment			• 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)			• investigate and describe properties of materials (e.g., investigate and describe the melting point, solubility and conductivity of materials observed)
• describe human uses of plants as sources of food and raw materials, and give examples of other uses (e.g., identify uses of plants as herbs or medicines; describe plant products, and identify plant sources on which they depend)			• apply the concept of system in describing familiar organisms and analyzing their general structure and function			• describe and apply different ways of classifying materials based on their composition and properties, including: – distinguishing between pure substances, solutions and mechanical mixtures – distinguishing between metals and nonmetals [Note: Metalloids may also be introduced at this level but are not required.] – identifying and applying other methods of classification
• investigate trends in land use from natural environments (e.g., forests, grasslands) to managed environments (e.g., farms, gardens, greenhouses) and describe changes			• 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)			• identify conditions under which properties of a material are changed, and critically evaluate if a new substance has been produced
• investigate practical problems and issues in maintaining productive plants within sustainable environments, and identify questions for further study (e.g., investigate the long-term effects of irrigation practices or fertilizer use)						

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2. Investigate life processes and structures of plants, and interpret related characteristics and needs of plants in a local environment	2. Investigate and describe the role of cells within living things	2. Describe and interpret patterns in chemical reactions
• describe the general structure and functions of seed plants (e.g., describe the roots, stem, leaves and flower of a common local plant)	• describe the role of cells as a basic unit of life	• identify and evaluate dangers of caustic materials and potentially explosive reactions
• investigate and interpret variations in plant structure, and relate these to different ways that plants are adapted to their environment (e.g., distinguish between plants with shallow spreading roots and those with deep taproots; describe and interpret differences in flower form and in the timing of flower production)	• 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)	• observe and describe evidence of chemical change in reactions between familiar materials, by: – describing combustion, corrosion and other reactions involving oxygen – observing and inferring evidence of chemical reactions between familiar household materials
• investigate and interpret variations in needs of different plants and their tolerance for different growing conditions (e.g., tolerance for drought, soil salinization or short growing seasons)	• distinguish between plant and animal cells (e.g., distinguish between cell walls and cell membranes)	• distinguish between materials that react readily and those that do not (e.g., compare reactions of different metals to a dilute corrosive solution)
• describe the processes of diffusion, osmosis, conduction of fluids, transpiration, photosynthesis and gas exchange in plants [Note: This item requires a general understanding of the processes; it does not require knowledge of the specific biochemistry of these processes.]	• 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.]	• observe and describe patterns of chemical change, by: – observing heat generated or absorbed in chemical reactions, and identifying examples of exothermic and endothermic reactions – identifying conditions that affect rates of reactions (e.g., investigate and describe how factors such as heat, concentration, surface area and electrical energy can affect a chemical reaction) – identifying evidence for conservation of mass in chemical reactions, and demonstrating and describing techniques by which that evidence is gathered.
• describe life cycles of seed plants, and identify example methods used to ensure their germination, growth and reproduction (e.g., describe propagation of plants from seeds and vegetative techniques, such as cuttings; conduct a germination study; describe the use of beehives to support pollination)	• examine plant and animal structures; and identify contributing roles of cells, tissues and organs	
3. Analyze plant environments, and identify impacts of specific factors and controls	3. Interpret the healthy function of human body systems, and illustrate ways the body reacts to internal and external stimuli	3. Describe ideas used in interpreting the chemical nature of matter, both in the past and present, and identify example evidence that has contributed to the development of these ideas
• describe methods used to increase yields, through modifying the environment and by creating artificial environments (e.g., describe processes used in raising bedding plants or in vegetable production through hydroponics)	• 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)	• demonstrate understanding of the origins of the periodic table, and relate patterns in the physical and chemical properties of elements to their positions in the periodic table—focusing on the first 18 elements
• investigate and describe characteristics of different soils and their major component (e.g., distinguish among clayey soils, sandy soils and soils rich in organic content; investigate and describe particle sizes, compaction and moisture content of soil samples)	• 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)	• distinguish between observation and theory, and provide examples of how models and theoretical ideas are used in explaining observations (e.g., describe how observations of electrical properties of materials led to ideas about electrons and protons; describe how observed differences in the densities of materials are explained, in part, using ideas about the mass of individual atoms)
• identify practices that may enhance or degrade soils in particular applications	• 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)	• use the periodic table to identify the number of protons, electrons and other information about each atom; and describe, in general terms, the relationship between the structure of atoms in each group and the properties of elements in that group (e.g., use the periodic table to determine that sodium has 11 electrons and protons and, on average, about 12 neutrons; infer that different rows (periods) on the table reflect differences in atomic structure; interpret information on ion charges provided in some periodic tables) [Note: Knowledge of specific orbital structures for elements and groups of elements is not required at this grade level.]
• describe and interpret the consequences of using herbicides, pesticides and biological controls in agriculture and forestry	• 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)	• distinguish between ionic and molecular compounds, and describe the properties of some common examples of each
4. Identify and interpret relationships among human needs, technologies, environments, and the culture and use of living things as sources of food and fibre	4. Describe areas of scientific investigation leading to new knowledge about body systems and to new medical applications	4. Apply simplified chemical nomenclature in describing elements, compounds and chemical reactions
• investigate and describe the development of plant varieties through selective breeding, and identify related needs and problems (e.g., identify needs leading to the development of new grain varieties; identify problems arising from the development of new plant varieties that require extensive fertilization)	• 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)	• read and interpret chemical formulas for compounds of two elements, and give the IUPAC (International Union of Pure and Applied Chemistry) name and common name of these compounds (e.g., give, verbally and in writing, the name for NaCl(s) (sodium chloride), CO2(g) (carbon dioxide), MgO(s) (magnesium oxide), NH3(g) (nitrogen trihydride or ammonia), CH4(g) (carbon tetrahydride or methane), FeCl2(s) (iron(II) chloride), FeCl3(s) (iron(III) chloride)

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• investigate and identify intended and unintended consequences of environmental management practices (e.g., identify problems arising from monocultural land use in agricultural and forestry practices, such as susceptibility to insect infestation or loss of diversity)	• 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)	• identify/describe chemicals commonly found in the home, and write the chemical symbols (e.g., table salt [NaCl(s)], water [H2O(l)], sodium hydroxide [NaOH(aq)] used in household cleaning supplies)
• identify the effects of different practices on the sustainability of agriculture and environmental resources (e.g., identify positive and negative effects of using chemical fertilizers and pesticides and of using organic farming practices)		• identify examples of combining ratios/number of atoms per molecule found in some common materials, and use information on ion charges to predict combining ratios in ionic compounds of two elements (e.g., identify the number of atoms per molecule signified by the chemical formulas for CO(g) and CO2(g); predict combining ratios of iron and oxygen based on information on ion charges of iron and oxygen)
		• assemble or draw simple models of molecular and ionic compounds (e.g., construct models of some carbon compounds using toothpicks, peas and cubes of potato) [Note: Diagrams and models should show the relative positions of atoms. Diagrams of orbital structures are not required at this grade level.]
		• describe familiar chemical reactions, and represent these reactions by using word equations and chemical formulas and by constructing models of reactants and products (e.g., describe combustion reactions, such as: carbon + oxygen → carbon dioxide [C(s) + O2(g) → CO2(g)]; describe corrosion reactions, such as: iron + oxygen → iron(II) oxide [Fe(s) + O2(g) → FeO(s)]; describe replacement reactions, such as the following: zinc + copper(II) sulfate → zinc sulfate + copper [Zn(s) + CuSO4(aq) → ZnSO4(aq) + Cu(s)]) [Note 1: This outcome does not require students to explain the formation of polyatomic ions. Some chemicals with polyatomic ions may nevertheless be introduced; e.g., a brief introduction to CuSO4(s), ZnSO4(s) and H2SO4(aq) can help prepare students for further study of these materials in units C and D.] [Note 2: At this grade level, students are not required to balance reactants and products in chemical equations. Teachers may want to inform students about opportunities for further study of chemistry in Science 10 and in Science 14–24.]
Specific Outcomes for Skills	**Specific Outcomes for Skills**	**Specific Outcomes for Skills**
Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions
• define practical problems (e.g., identify problems in growing plants under dry conditions)	• identify questions to investigate (e.g., identify questions that arise from their own observations of plant and animal diversity)	• identify questions to investigate (e.g., ask questions about the reactivity of particular materials or about conditions that affect the rate of reaction, after observing that materials react at different rates)
• identify questions to investigate arising from practical problems and issues (e.g., What methods will help limit moisture loss from plants and soil? What reduction in the loss of soil moisture can be achieved through the use of a plastic ground sheet or through the use of a plastic canopy?)	• 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?”)	• define and delimit questions and problems to facilitate investigation (e.g., reframe a general question, such as: “What affects the speed of reactions?” to become one or more specific questions, such as: “How will temperature affect the rate of reaction between materials x and y?” or “How will moisture affect the rate of reaction between x and y?”)
• rephrase questions in a testable form, and clearly define practical problems (e.g., rephrase a broad question, such as: “What amount of fertilizer is best?” to become “What effect will the application of different quantities of fertilizer X have on the growth of plant Y and its environment?”)	• formulate operational definitions of major variables and other aspects of their investigations (e.g., define body systems in terms of the functions they perform)	• state a prediction and a hypothesis based on background information or an observed pattern of events
• state a prediction and a hypothesis based on background information or an observed pattern of events (e.g., predict the effect of a particular plant treatment)		• select appropriate methods and tools for collecting data and information and for solving problems (e.g., plan and conduct a search for information about chemical elements, using appropriate print and electronic sources)
• formulate operational definitions (e.g., define the health of a plant in terms of its colour and growth pattern)		
Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data
• research information relevant to a given problem • construct and test a prototype design to achieve a specific purpose (e.g., develop and test a device for watering house plants over a two-week absence)	• use instruments—including microscopes—effectively and accurately for collecting data (e.g., use a microscope to produce a clear image of cells)	• carry out procedures, controlling the major variables (e.g., investigate the effect of particle size on a chemical reaction, taking care to identify and control other potentially relevant variables)
• observe and record data, and create simple line drawings (e.g., describe plant growth, using qualitative and quantitative observations; draw and describe plant changes resulting from an experimental procedure)	• estimate measurements (e.g., estimate the size of an object viewed under a microscope)	• observe and record data, and prepare simple drawings (e.g., represent a molecule studied through a drawing) • demonstrate knowledge of WHMIS standards, by using proper techniques for handling and disposing of laboratory materials

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• estimate measurements (e.g., estimate plant populations; estimate the surface area of a leaf)	• 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)	• research information relevant to a given question (e.g., research properties of materials)
Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations	Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations	Analyzing and Interpreting Students will: 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 two different ways to measure the amount of moisture in soil; evaluate different ways of presenting data on the health and growth of plants)	• identify strengths and weaknesses of different methods of collecting and displaying data (e.g., compare methods of measuring heart rate)	• compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs, line graphs and scatterplots (e.g., present data on different chemical substances in a form that facilitates interpretation)
• use and/or construct a classification key (e.g., distinguish among several grain varieties, using a classification guide or key)	• 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)	• calculate theoretical values of a variable (e.g., predict the total mass of the products of a chemical reaction, based on the mass of the reactants used) [Note: In this example, students can apply the law of conservation of mass.]
• 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 a record of a plant's growth that charts its development in terms of height, leaf development, flowering and seed production)	• 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 and suggest explanations for discrepancies in data • state a conclusion, based on experimental data, and explain how evidence gathered supports or refutes an initial idea
• identify new questions and problems that arise from what was learned	• identify new questions and problems that arise from what was learned	• identify new questions and problems that arise from what was learned (e.g., identify new questions, such as: "Why do different compounds containing the same elements behave differently?" or "How do atoms stick together in a molecule?")
Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	Communication and Teamwork Students will: 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 counting or estimating the population of a group of plants)	• receive, understand and act on the ideas of others (e.g., adopt and use an agreed procedure for preparing diagrams and charts)	• receive, understand and act on the ideas of others (e.g., follow given safety procedures)
• 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 growth of a group of plants over time through a data table and diagrams)	• communicate questions, ideas, intentions, plans and results, using lists, notes in point form, sentences, data tables, graphs, drawings, oral language and other means	• evaluate individual and group processes used in planning and carrying out investigative tasks (e.g., evaluate the relative success and scientific merits of different approaches to drawing and making models of molecules)
• evaluate individual and group processes used in planning, problem solving, decision making and completing a task	• 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)	
Specific Outcomes for Attitudes	**Specific Outcomes for Attitudes**	**Specific Outcomes for Attitudes**
Interest in Science Students will be encouraged to: Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., observe plants in the local community, and ask questions about plants with unusual characteristics; pursue a hobby related to the study of living things; express an interest in science-related/technology-related careers)	Interest in Science Students will be encouraged to: 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)	Interest in Science Students will be encouraged to: Show interest in science-related questions and issues, and confidently pursue personal interests and career possibilities within science-related fields (e.g., express a degree of satisfaction at understanding science concepts that are challenging)
Mutual Respect Students will be encouraged to: Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., show awareness of the diversity of agricultural practices used by societies around the world at different times through history; appreciate the role of Aboriginal knowledge in identifying useful herbs and medicines)	Mutual Respect Students will be encouraged to: 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)	Mutual Respect Students will be encouraged to: Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., show an interest in the contributions that women and men— from many cultural backgrounds and different times—have made to the development of modern science; recognize that work done to investigate chemical properties and to develop models are both important steps toward scientific understanding
Scientific Inquiry Students will be encouraged to: Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., consider the nutrient content of food they eat and the potential presence of residues; consider observations and ideas from a number of sources, during investigations and before drawing conclusions)	Scientific Inquiry Students will be encouraged to: 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)	Scientific Inquiry Students will be encouraged to: 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 during investigations and before drawing conclusions; honestly report and record all observations, even when the evidence is unexpected)

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Collaboration Students will be encouraged to: 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)	Collaboration Students will be encouraged to: 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)	Collaboration Students will be encouraged to: Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., demonstrate interest and become involved in decision making that requires full-group participation; assume responsibility for their share of the work to be done; work with other individuals)
Stewardship Students will be encouraged to: Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., voluntarily care for plants in a school or home environment; assume personal responsibility for their impact on the environment; recognize that their consumption habits have environmental consequences)	Stewardship Students will be encouraged to: 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)	Stewardship Students will be encouraged to: Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., recognize that the materials people develop may have environmental consequences when people dispose of them; participate in school projects that address a chemical pollution issue)
Safety Students will be encouraged to: Show concern for safety in planning, carrying out and reviewing activities (e.g., 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)	Safety Students will be encouraged to: 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)	Safety Students will be encouraged to: Show concern for safety in planning, carrying out and reviewing activities (e.g., read the labels of materials before using them, and ask for help if safety symbols are not clear or understood; carefully manipulate materials, using skills learned in class; wear proper safety attire without having to be reminded; ensure the proper disposal of materials; readily alter a procedure to ensure the safety of members of the group; immediately advise the teacher of spills, and use appropriate techniques and materials to clean up)

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Unit C: Heat and Temperature (*Plan for teaching in person)			**Unit C: Light and Optical Systems**			**Unit C: Environmental Chemistry**
Specific Outcomes for Science, Technology and Society	**Essential Vocabulary**	**Math Connection**	**Specific Outcomes for Science, Technology and Society**	**Essential Vocabulary**	**Math Connection**	**Outcomes for Science, Technology and Society**
1. Illustrate and explain how human needs have led to technologies for obtaining and controlling thermal energy and to increased use of energy resources	Change of State Conduction Contraction Convection Energy Conservation Energy Transfer Expansion Gas Heat Insulation Kinetic Energy Liquid Manipulating Variable Non-Renewable Resource Particle Theory Qualitative Quantitative Radiation Renewable Resource Responding Variable Solid Temperature Thermal Energy		1. Investigate the nature of light and vision; and describe the role of invention, explanation and inquiry in developing our current knowledge	Absorb Concave Mirror Converge Convex Mirror Diverge Double Concave Lens Double Convex Lens Law of Reflection Law of Refraction Microscope Opaque Parts of the Eye Ray Telescope Translucent Transmit Transparent	•Measuring Angles (gr. 6/7)	1. Investigate and describe, in general terms, the role of different substances in the environment in supporting or harming humans and other living things
• investigate and interpret examples of heat-related technologies and energy use in the past (e.g., investigate uses of heat for domestic purposes, such as cooking or home heating, and for industrial processes, such as ceramics, metallurgy or use of engines)			• 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)			• identify common organic and inorganic substances that are essential to the health and growth of humans and other living things, and illustrate the roles served by these substances (e.g., identify calcium as an essential material for bones; identify minerals that are known to enhance plant growth but that limit growth if too little or too much is available)
• trace linkages between human purposes and the development of heat-related materials and technologies (e.g., development of hair dryers and clothes dryers; development of protective clothing, such as oven mitts, ski suits and survival clothing)			• 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			• describe, in general terms, the forms of organic matter synthesized by plants and animals, including carbohydrates, proteins and lipids • describe and illustrate processes by which chemicals are introduced to the environment or their concentrations are changed (e.g., dilution in streams, biomagnification through food chains)
• identify and explain uses of devices and systems to generate, transfer, control or remove thermal energy (e.g., describe how a furnace and wall thermostat keep a house at a constant temperature)			• 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)			• describe the uptake of materials by living things through ingestion or absorption, and investigate and describe evidence that some materials are difficult for organisms to break down or eliminate (e.g., DDT, mercury)
• identify examples of personal and societal choices in using energy resources and technology (e.g., identify choices that affect the amount of hot water used in their daily routines; identify choices in how that water is heated)						• identify questions that may need to be addressed in deciding what substances—in what amounts—can be safely released into the environment (e.g., identify questions and considerations that may be important in determining how much phosphate can be released into river water without significant harm to living things)
2. Describe the nature of thermal energy and its effects on different forms of matter, using informal observations, experimental evidence and models			2. Investigate the transmission of light, and describe its behaviour using a geometric ray model			2. Identify processes for measuring the quantity of different substances in the environment and for monitoring air and water quality
• compare heat transmission in different materials (e.g., compare conduction of heat in different solids;			• 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)			• identify substrates and nutrient sources for living things within a variety of environments • describe and illustrate the use of biological monitoring as one method for determining environmental quality (e.g., assess water quality, by observing the relative abundance of various vertebrate and invertebrate species)

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• compare the absorption of radiant heat by different surfaces) explain how heat is transmitted by conduction, convection and radiation in solids, liquids and gases	• measure and predict angles of reflection	• identify chemical factors in an environment that might affect the health and distribution of living things in that environment (e.g., available oxygen, pH, dissolved nutrients in soil)
• describe the effect of heat on the motion of particles; and explain changes of state, using the particle model of matter	• 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)	• apply and interpret measures of chemical concentration in parts per million, billion or trillion
• distinguish between heat and temperature; and explain temperature, using the concept of kinetic energy and the particle model of matter	• investigate materials used in optical technologies; and predict the effects of changes in their design, alignment or composition	• identify acids, bases and neutral substances, based on measures of their pH (e.g., use indicator solutions or pH meters to measure the pH of water samples)
• investigate and describe the effects of heating and cooling on the volume of different materials, and identify applications of these effects (e.g., use of expansion joints on bridges and railway tracks to accommodate thermal expansion)		• investigate, safely, and describe the effects of acids and bases on each other and on other substances (e.g., investigate and describe the reaction that results when baking powder is dissolved; describe the role of acids and bases in neutralizing each other)
3. Apply an understanding of heat and temperature in interpreting natural phenomena and technological devices		• describe effects of acids and bases on living things (e.g., acid rain in lakes, antacids for upset stomachs, pH in shampoos and conditioners)
• describe ways in which thermal energy is produced naturally (e.g., solar radiation, combustion of fuels, living things, geothermal sources and composting)	3. Investigate and explain the science of image formation and vision, and interpret related technologies	3. Analyze and evaluate mechanisms affecting the distribution of potentially harmful substances within an environment
• describe examples of passive and active solar heating, and explain the principles that underlie them (e.g., design of homes to maximize use of winter sunshine)	• 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)	• describe mechanisms for the transfer of materials through air, water and soil; and identify factors that may accelerate or retard distribution (e.g., wind speed, soil porosity)
• compare and evaluate materials and designs that maximize or minimize heat energy transfer (e.g., design and build a device that minimizes energy transfer, such as an insulated container for hot drinks; evaluate different window coatings for use in a model home) • explain the operation of technological devices and systems that respond to temperature change (e.g., thermometers, bimetallic strips, thermostatically-controlled heating systems)	• demonstrate and explain the use of microscopes; and describe, in general terms, the function of eyeglasses, binoculars and telescopes	• describe mechanisms for biodegradation, and interpret information on the biodegradability of different materials
• describe and interpret the function of household devices and systems for generating, transferring, controlling or removing thermal energy (e.g., describe in general terms the operation of heaters, furnaces, refrigerators and air conditioning devices)	• **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)	• comprehend information on the biological impacts of hazardous chemicals on local and global environments, by: – interpreting evidence for environmental changes in the vicinity of a substance release – interpreting LD50 data and other information on toxicity [Note: LD50 refers to the amount of a substance found to be lethal to 50% of a population, if ingested.] – identifying concerns with the disposal of domestic wastes, such as paints and oils, and industrial wastes
• investigate and describe practical problems in controlling and using thermal energy (e.g., heat losses, excess energy consumption, damage to materials caused by uneven heating, risk of fire)	• investigate and interpret emerging technologies for storing and transmitting images in digital form (e.g., digital cameras, infrared imaging, remote imaging technologies)	• describe and evaluate methods used to transport, store and dispose of hazardous household chemicals
4. Analyze issues related to the selection and use of thermal technologies, and explain decisions in terms of advantages and disadvantages for sustainability		• investigate and evaluate potential risks resulting from consumer practices and industrial processes, and identify processes used in providing information and setting standards to manage these risks (e.g., interpret and explain the significance of manufacturer's information on how wood preservatives can be safely applied; recognize that some individuals may have greater sensitivity to particular chemical substances than do others in the general population)
• identify and evaluate different sources of heat and the environmental impacts of their use (e.g., identify advantages and disadvantages of fossil fuel use; compare the use of renewable and nonrenewable sources in different applications)		• identify and evaluate information and evidence related to an issue in which environmental chemistry plays a major role (e.g., evaluate evidence that the use of insecticides to control mosquitoes has an effect/has no effect on bird populations)
• compare the energy consumption of alternative technologies for heat production and use, and identify related questions and issues (e.g., compare the energy required in alternative cooking technologies, such as electric stoves, gas stoves, microwave ovens and solar cookers; identify issues regarding safety of fuels, hot surfaces and combustion products)		
• identify positive and negative consequences of energy use, and describe examples of energy conservation in their home or community		

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Specific Outcomes for Skills	**Specific Outcomes for Skills**	**Specific Outcomes for Skills**
Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions
• identify science-related issues (e.g., identify an economic issue related to heat loss in a building)	• identify questions to investigate (e.g., ask about the role of eyeglasses in improving vision)	• identify science-related issues (e.g., identify issues regarding the use of soil fertilizers)
• identify questions to investigate arising from a problem or issue (e.g., ask a question about the source of cold air in a building, or about ways to prevent cold areas)	• 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?")	• identify questions arising from practical problems and issues (e.g., ask questions about the needs of different living things for nutrients and about the mechanisms by which these nutrients are obtained)
• phrase questions in a testable form, and clearly define practical problems (e.g., rephrase a general question, such as: "How can we cut heat loss through windows?" to become "What effect would the addition of a plastic layer have on heat loss through window glass?" or "How would the use of double- or triple-paned windows affect heat loss?")	• design an experiment, and identify the major variables	• state a prediction and a hypothesis about the concentration or dispersal of a chemical substance within an environment (e.g., state a hypothesis that relates the amount of oxygen in a local water sample to the presence or absence of dissolved nutrients)
• design an experiment, and control the major variables (e.g., design an experiment to evaluate two alternative designs for solar heating a model house)	• 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)	• select appropriate methods and tools for collecting data and information and for solving problems (e.g., design an investigation to compare the chemical characteristics of two soils)
Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	• formulate operational definitions of major variables and other aspects of their investigations (e.g., operationally define "refraction" and "beam of light")	Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data
• identify data and information that are relevant to a given problem or issue	Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	• identify data and information that are relevant to the issue • select and integrate information that is relevant to the issue (e.g., demonstrate proficiency in uploading and downloading text, image, audio and video files)
• select and integrate information from various print and electronic sources or from several parts of the same source (e.g., describe current solar energy applications in Canada, based on information from a variety of print and electronic sources)	• carry out procedures, controlling the major variables	• use instruments and materials effectively and accurately for collecting data (e.g., measure and compare the pH in household products, foods and environments) • organize data, using a format that is appropriate to the task or experiment
• use instruments effectively and accurately for collecting data and information (e.g., accurately read temperature scales and use a variety of thermometers; demonstrate skill in downloading text, images, and audio and video files on methods of solar heating)	• 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 tools and apparatus safely
• carry out procedures, controlling the major variables (e.g., show appropriate attention to controls in investigations of the insulative properties of different materials)	• 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 Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations	Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanation	Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations
• 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., construct a database to enter, compare and present data on the insulative properties of different materials) • identify, and suggest explanations for, discrepancies in data	• 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)	• identify strengths and weaknesses of different ways of displaying data • identify and suggest explanations for discrepancies in data (e.g., identify possible reasons for variation in the measured concentration of a chemical, where one sample is very different from others or where one group has a very different result from others)
• identify and evaluate potential applications of findings (e.g., the application of heat transfer principles to the design of homes and protective clothing) • test the design of a constructed device or system (e.g., test a personally-constructed heating or cooling device)	• 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 the line of best fit on a scatterplot, and interpolate or extrapolate based on the line of best fit (e.g., interpret class data on the effects of acidity on mould growth, graph the data, prepare a line of best fit, and predict the amount of growth that might be expected at different acidity values)
	• 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)	• apply given criteria for evaluating evidence and sources of information (e.g., use scatterplot data in evaluating how strong a relationship exists between two variables; evaluate claims of environmental impacts, based on the scope and relevance of supporting evidence)
		• identify new questions and problems that arise from what was learned

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Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results
• 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., use electronic hardware to generate data summaries and graphs of group data, and present these findings)	• receive, understand and act on the ideas of others (e.g., act on the suggestions of others in testing and manipulating various lens combinations)	• work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise
• defend a given position on an issue, based on their findings (e.g., defend the use of a particular renewable or nonrenewable source of heat energy in a particular application)	• recommend an appropriate way of summarizing and interpreting	• receive, understand and act on the ideas of others (e.g., seek and achieve group consensus on procedures to be used in an investigative activity, and act on that consensus)
		• defend a given position on an issue or problem, based on their findings (e.g., provide a clear rationale for a choice between alternative chemical products in a consumer application)
Attitude Outcomes	**Attitude Outcomes**	**Attitude Outcomes**
Interest in Science Students will be encouraged to: Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., apply ideas learned in asking and answering questions about everyday phenomena related to heat; show interest in a broad scope of science-related fields in which heat plays a significant role)	Interest in Science Students will be encouraged to: 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)	Interest in Science Students will be encouraged to: Show interest in science-related questions and issues, and confidently pursue personal interests and career possibilities within science-related fields (e.g., actively participate in extracurricular activities, such as science fairs, science clubs, or science and technology challenges)
Mutual Respect Students will be encouraged to: Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., appreciate Aboriginal home designs of the past and present that use locally-available materials; recognize that science and technology develop in response to global concerns, as well as to local needs; consider more than one factor or perspective when making decisions on STS	Mutual Respect Students will be encouraged to: 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)	Mutual Respect Students will be encouraged to: Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., consider more than one perspective when formulating conclusions, solving problems or making decisions on environmental quality issues)
Scientific Inquiry Students will be encouraged to: Seek and apply evidence when evaluating alternative approaches to investigations, problems andissues (e.g., view a situation from different perspectives; propose options and compare them when making decisions or taking action)	Scientific Inquiry Students will be encouraged to: 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)	Scientific Inquiry Students will be encouraged to: Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., consider observations and ideas from a number of sources during investigations and before drawing conclusions; strive to assess a problem or situation accurately, by careful analysis of evidence gathered)
Collaboration Students will be encouraged to: 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; seek consensus before making decisions)	Collaboration Students will be encouraged to: 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)	Collaboration Students will be encouraged to: 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)
Stewardship Students will be encouraged to: Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., recognize the distinction between renewable and nonrenewable resources and the implications this has for responsible action; objectively identify potential conflicts between responding to human wants and needs and protecting the environment)	Stewardship Students will be encouraged to: 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)	Stewardship Students will be encouraged to: Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., show respect for all forms of life; modify their behaviour in light of an issue related to conservation and protection of the environment; recognize that the materials people use may have environmental consequences when people dispose of them)
Safety Students will be encouraged to: Show concern for safety in planning, carrying out and reviewing activities (e.g., demonstrate concern for self and others in planning and carrying out experimental activities involving the heating of materials; select safe methods for collecting evidence and solving problems)	Safety Students will be encouraged to: 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)	Safety Students will be encouraged to: 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; use safety precautions without being reminded)

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Unit D: Structures and Forces			**Unit D: Structures and Forces**			**Unit D: Electrical Principles and Technologies**
Specific Outcomes for Science, Technology and Society	**Essential Vocabulary**	**Math Connection**	**Specific Outcomes for Science, Technology and Society**	**Essential Vocabulary**	**Math Connection**	**Outcomes for Science, Technology and Society**
1. Describe and interpret different types of structures encountered in everyday objects, buildings, plants and animals; and identify materials from which they are made	Compression Controlled Variable Force Friction Gravity Load Manipulated Variable Mass Newtons Responding Variable Sheer Spring Scale Structures Tension Torsion	• Mulitplying and Dividing by Powers of 10 when converting between kg and Newtons	1. Illustrate the development of science and technology by describing, comparing and interpreting mechanical devices that have been improved over time	Efficiency Energy Fluid Compression Force Force Ratio Friction Function Hydraulic Imput Mechanical Advantage Output Pneumatic Pressure Simple Machines Speed Ratio Subsystem System Work	• Fractions • Formulas • Percent • Rates • Ratios • Units • Unit Conversion	1. Investigate and interpret the use of devices to convert various forms of energy to electrical energy, and electrical energy to other forms of energy • identify, describe and interpret examples of mechanical, chemical, thermal, electrical and light energy
• recognize and classify structural forms and materials used in construction (e.g., identify examples of frame structures, such as goal posts and girder bridges, examples of shell structures, such as canoes and car roofs, and examples of frame-and-shell structures, such as houses and apartment buildings)			• 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)			• investigate and describe evidence of energy transfer and transformation (e.g., mechanical energy transformed into electrical energy, electrical energy transferred through power grids, chemical energy converted to electrical energy and then to light energy in a flashlight, thermal energy converted to electrical energy in a thermocouple)
• interpret examples of variation in the design of structures that share a common function, and evaluate the effectiveness of the designs (e.g., compare and evaluate different forms of roofed structures, or different designs for communication towers)			• illustrate how a common need has been met in different ways over time (e.g., development of different kinds of lifting devices)			• investigate and evaluate the use of different electrodes, electrolytes and electrolytic concentrations in designing electrical storage cells
• describe and compare example structures developed by different cultures and at different times; and interpret differences in functions, materials and aesthetics (e.g., describe traditional designs of indigenous people and peoples of other cultures; compare classical and current designs; investigate the role of symmetry in design)			• illustrate how trial and error and scientific knowledge both play a role in technological development (e.g., development of aircraft)			• construct, use and evaluate devices for transforming mechanical energy into electrical energy and for transforming electrical energy into mechanical energy • modify the design of an electrical device, and observe and evaluate resulting changes (e.g., investigate the effect of changes in the orientation and placement of magnets, commutator and armature in a St. Louis motor or in a personally-built model of a motor)
• describe and interpret natural structures, including the structure of living things and structures created by animals (e.g., skeletons, exoskeletons, trees, birds' nests) • identify points of failure and modes of failure in natural and built structures (e.g., potential failure of a tree under snow load, potential failure of an overloaded bridge)						
2. Investigate and analyze forces within structures, and forces applied to them			2. Analyze machines by describing the structures and functions of the overall system, the subsystems and the component parts			2. Describe technologies for transfer and control of electrical energy • assess the potential danger of electrical devices, by referring to the voltage and current rating (amperage) of the devices; and distinguish between safe and unsafe activities
• recognize and use units of force and mass, and identify and measure forces and loads • identify examples of frictional forces and their use in structures (e.g., friction of a nail driven into wood, friction of pilings or footings in soil, friction of stone laid on stone) • identify tension, compression, shearing and bending forces within a structure; and describe how these forces can cause the structure to fail (e.g., identify tensile forces that cause lengthening and possible snapping of a member; identify bending forces that could lead to breakage)			• 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 • identify the source of energy for some familiar mechanical devices			• distinguish between static and current electricity, and identify example evidence of each • identify electrical conductors and insulators, and compare the resistance of different materials to electric flow (e.g., compare the resistance of copper wire and nickel-chromium/Nichrome wire; investigate the conduction of electricity through different solutions; investigate applications of electrical resistance in polygraph or lie detector tests)
• analyze a design, and identify properties of materials that are important to individual parts of the structure (e.g., recognize that cables can be used as a component of structures where only tensile forces are involved; recognize that beams are subject to tension on one side and compression on the other; recognize that flexibility is important in some structures)			• 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)			• use switches and resistors to control electrical flow, and predict the effects of these and other devices in given applications (e.g., investigate and describe the operation of a rheostat)
• infer how the stability of a model structure will be affected by changes in the distribution of mass within the structure and by changes in the design of its foundation (e.g., infer how the stability of a structure will be affected by increasing the width of its foundation)						• describe, using models, the nature of electrical current; and explain the relationship among current, resistance and voltage (e.g., use a hydro-flow model to explain current, resistance and voltage)
						• measure voltages and amperages in circuits (e.g., determine the resistance in a circuit with a dry cell and miniature light; determine the resistances of copper, nickel-chromium/ Nichrome wire, pencil graphite and salt solution) – apply Ohm's law to calculate resistance, voltage and current in simple circuits

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		• develop, test and troubleshoot circuit designs for a variety of specific purposes, based on low voltage circuits (e.g., develop and test a device that is activated by a photoelectric cell; develop a model hoist that will lift a load to a given level, then stop and release its load; test and evaluate the use of series and parallel circuits for wiring a set of lights)
		• investigate toys, models and household appliances; and draw circuit diagrams to show the flow of electricity through them (e.g., safely dismantle discarded devices, such as heating devices or motorized toys, and draw diagrams to show the loads, conductors and switching mechanisms) • identify similarities and differences between microelectronic circuits and circuits in a house (e.g., compare switches in a house with transistors in a microcircuit)
3. Investigate and analyze the properties of materials used in structures	3. Investigate and describe the transmission of force and energy between parts of a mechanical system	3. Identify and estimate energy inputs and outputs for example devices and systems, and evaluate the efficiency of energy conversions
• devise and use methods of testing the strength and flexibility of materials used in a structure (e.g., measure deformation under load) • identify points in a structure where flexible or fixed joints are required, and evaluate the appropriateness of different types of joints for the particular application (e.g., fixed jointing by welding, gluing or nailing; hinged jointing by use of pins or flexible materials) • compare structural properties of different materials, including natural materials and synthetics	• 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 *If we have students in classes in school • 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 the forms of energy inputs and outputs in a device or system • apply appropriate units, measures and devices in determining and describing quantities of energy transformed by an electrical device, by: – measuring amperage and voltage, and calculating the number of watts consumed by an electrical device, using the formula P = IV [power (in watts) = current (in amps) × voltage (in volts)] – calculating the quantity of electric energy, in joules, transformed by an electrical device, using the formula E = P × t [energy (in joules) = power (in watts) × time (in seconds)]
• investigate and describe the role of different materials found in plant and animal structures (e.g., recognize the role of bone, cartilage and ligaments in vertebrate animals, and the role of different layers of materials in plants	• 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	• the concepts of conservation of energy and efficiency to the analysis of energy devices (e.g., identify examples of energy dissipation in the form of heat, and describe the effect of these losses on useful energy output)
	• 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)	• compare energy inputs and outputs of a device, and calculate its efficiency, using the formula, percent efficiency = energy output/energy input × 100 (e.g., compare the number of joules of energy used with the number of joules of work produced, given information on electrical consumption and work output of a motor-driven device)
	• describe and interpret technologies based on hydraulics and pneumatics (e.g., applications in hydraulic lifts and air-driven tools)	• investigate and describe techniques for reducing waste of energy in common household devices (e.g., by eliminating sources of friction in mechanical components, using more efficient forms of lighting, reducing overuse of appliances as in “overdrying” of clothes)
4. Demonstrate and describe processes used in developing, evaluating and improving structures that will meet human needs with a margin of safety	4. Analyze the social and environmental contexts of science and technology, as they apply to the development of mechanical devices	4. Describe and discuss the societal and environmental implications of the use of electrical energy
• demonstrate and describe methods to increase the strength of materials through changes in design (e.g., corrugation of surfaces, lamination of adjacent members, changing the shape of components, changing the method of fastening)	• 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	• identify and evaluate sources of electrical energy, including oil, gas, coal, biomass, wind and solar (e.g., identify and evaluate renewable and nonrenewable sources for generating electricity; evaluate the use of batteries as an alternative to internal combustion engines)
• identify environmental factors that may affect the stability and safety of a structure, and describe how these factors are taken into account (e.g., recognize that snow load, wind load and soil characteristics need to be taken into account in building designs; describe example design adaptations used in earthquake-prone regions)	• 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	• describe the by-products of electrical generation and their impacts on the environment (e.g., identify by-products and potential impacts of coal-fired electricity generation)
• analyze and evaluate a technological design or process on the basis of identified criteria, such as costs, benefits, safety and potential impact on the environment	• illustrate how technological development is influenced by advances in science, and by changes in society and the environment	• identify example uses of electrical technologies, and evaluate technologies in terms of benefits and impacts (e.g., identify benefits and issues related to the use of electrical technologies for storing and transmitting personal information)
		• identify concerns regarding conservation of energy resources, and evaluate means for improving the sustainability of energy use
Specific Outcomes for Skills	**Specific Outcomes for Skills**	**Specific Outcomes for Skills**
Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions
• identify practical problems (e.g., identify a problem related to the stability of a structure)	• identify practical problems (e.g., identify problems related to the effectiveness or efficiency of a mechanical device)	• propose alternative solutions to a given practical problem, select one, and develop a plan

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• propose alternative solutions to a practical problem, select one, and develop a plan (e.g., propose an approach to increasing the stability of a structure)	• identify questions to investigate arising from practical problems (e.g., “What is the efficiency of this device?”)	• identify questions to investigate arising from practical problems and issues (e.g., identify questions, such as: “How can the amount of electric current in a circuit be controlled?”)
• select appropriate methods and tools for collecting data to solve problems (e.g., use or develop an appropriate method for determining if the mass of a structure is well distributed over its foundation)	• propose alternative solutions to a practical problem, select one, and develop a plan	• rephrase questions in a testable form, and clearly define practical problems (e.g., rephrase questions, such as: “Why do we use parallel circuits rather than series circuits in household wiring?” to become “How do series circuits and parallel circuits respond differently under load?”)
• formulate operational definitions of major variables and other aspects of their investigations (e.g., define flexibility of a component as the amount of deformation for a given load)	• 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) **If we have students in classes in school*	• state a prediction and a hypothesis based on background information or an observed pattern of events (e.g., predict the amount of current in a circuit of known resistance and applied voltage)
	• 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)	• formulate operational definitions of major variables in the study of electrical circuits (e.g., provide operational definitions for current, resistance, voltage, polarity)
Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data
• research information relevant to a given problem • organize data, using a format that is appropriate to the task or experiment (e.g., use a database or spreadsheet	• research information relevant to a given problem • select and integrate information from various print and electronic sources or from several parts of the same	• use tools and apparatus safely (e.g., use appropriate sources of electrical energy, and follow procedures to ensure personal and group safety)
• carry out procedures, controlling the major variables (e.g., ensure that tests to determine the effect of any one variable are based on changes to that variable only)	• 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)	• estimate measurements (e.g., estimate the efficiency of a mechanical device) • use instruments effectively and accurately for collecting data (e.g., use ammeters and voltmeters)
• use tools and apparatus safely (e.g., select appropriate tools, and safely apply methods for joining materials; use saws and other cutting tools safely)	• organize data, using a format that is appropriate to the task or experiment • use tools and apparatus safely	
Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations	Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations	Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations
• compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs, line graphs and scatterplots (e.g., plot a graph, showing the deflection of different materials tested under load)	• identify and correct practical problems in the way a prototype or constructed device functions	• test the design of a constructed device or system
• identify and evaluate potential applications of findings (e.g., identify possible applications of materials for which they have studied the properties)	• 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)	• evaluate designs and prototypes in terms of function, reliability, safety, efficiency, use of materials and impact on the environment (e.g., evaluate the safety, durability, efficiency and environmental impact of a personally-constructed wet cell design)
• test the design of a constructed device or system (e.g., test and evaluate a prototype design of a foundation for a model building to be constructed on sand)	• identify and evaluate potential applications of findings (e.g., identify possible applications of a simple machine or mechanical system they have studied)	• 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 • identify and correct practical problems in the way a prototype or constructed device functions		• identify and suggest explanations for discrepancies in data (e.g., measure the current in similar circuits, and provide possible explanations for differences in current flow) • identify potential sources of error, and determine the amount of error in a given measurement (e.g.,
Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results
• 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., produce a work plan, in cooperation with other team members, that identifies criteria for selecting materials and evaluating designs)	• 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)	• work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise
• work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise	• 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)	• 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., use charts to present data on the voltage, current (amperage) and resistance found in series and parallel circuits)
	• work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise	• defend a given position on an issue or problem based on their findings (e.g., develop and defend a proposal on the appropriateness of an alternative energy source in a given application)

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Specific Outcomes for Attitudes	**Specific Outcomes for Attitudes**	**Specific Outcomes for Attitudes**
Interest in Science Students will be encouraged to: Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., apply knowledge of structures in interpreting a variety of structures within their home community; ask questions about techniques and materials used, and show an interest in construction and engineering)	Interest in Science Students will be encouraged to: 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)	Interest in Science Students will be encouraged to: Show interest in science-related questions and issues, and confidently pursue personal interests and career possibilities within science-related fields (e.g., actively participate in extracurricular activities, such as science fairs or science and technology challenges; pursue a science- or technology-related hobby; choose to investigate topics related to electrical technologies)
Mutual Respect Students will be encouraged to: Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., recognize that a variety of structural forms have emerged fromd ifferent cultures at different times in history)	Mutual Respect Students will be encouraged to: 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)	Mutual Respect Students will be encouraged to: 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 scientific thinking, craftsmanship and collaborative effort that goes into the development of electrical devices and systems)
Scientific Inquiry Students will be encouraged to: 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)	Scientific Inquiry Students will be encouraged to: 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)	Scientific Inquiry Students will be encouraged to: Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., strive to assess a problem or situation accurately, by careful analysis of evidence gathered; ask questions to clarify meaning or confirm their understanding; report the limitations of their designs; continue working on a problem or research project until the best possible solutions or answers are found)
Collaboration Students will be encouraged to: Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., accept various roles within a group, including that of leadership; remain interested and involved in decision making that requires full-group participation; understand that they may disagree with others but still work in a collaborative manner)	Collaboration Students will be encouraged to: 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)	Collaboration Students will be encouraged to: Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., demonstrate interest and become involved in decision making that requires full-group participation; consider alternative ideas and interpretations suggested by members of the group; share the responsibility for difficulties encountered in an activity)
Stewardship Students will be encouraged to: Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., consider the cause-and-effect relationships of personal actions and decisions)	Stewardship Students will be encouraged to: 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)	Stewardship Students will be encouraged to: Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., objectively identify potential conflicts between responding to human wants and needs and protecting the environment)
Safety Students will be encouraged to: 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)	Safety Students will be encouraged to: 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)	Safety Students will be encouraged to: Show concern for safety in planning, carrying out and reviewing activities (e.g., select safe methods in using electrical devices; readily alter a procedure to ensure the safety of members of the group; stay at their own work area during an activity, respecting others' space, materials and work)

Grade 7			Grade 8			Grade 9
Unit E: Planet Earth			**Unit E: Freshwater and Saltwater Systems**			**Unit E: Space Exploration**
Specific Outcomes for Science, Technology and Society	**Essential Vocabulary**	**Math Connection**	**Specific Outcomes for Science, Technology and Society**	**Essential Vocabulary**	**Math Connection**	**Outcomes for Science, Technology and Society**
1. Describe and demonstrate methods used in the scientific study of Earth and in observing and interpreting its component materials	Continental Plates Erosion Gradual Change Igneous Metamorphic Mineral Plate Tectonics Rock Rock Cycle Sedimentation Sedimentary Sudden Change Weathering		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	Adaptation Biodiversity Clarity Climate Fresh Water Hardness Potable Quality Quantity Salinity Salt Water		1. Investigate and describe ways that human understanding of Earth and space has depended on technological development
• investigate and interpret evidence that Earth's surface undergoes both gradual and sudden change (e.g., recognize earthquakes, volcanoes and landslides as examples of sudden change; recognize glacial erosion and river erosion as examples of gradual/incremental change)			• 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)			• identify different ideas about the nature of Earth and space, based on culture and science (e.g., compare geocentric and heliocentric models [Note: knowledge of epicycles is not required]; describe Aboriginal views of space and those of other cultures; describe the role of observation in guiding scientific understanding of space)
• interpret models that show a layered structure for Earth's interior; and describe, in general terms, evidence for such models			• recognize that fresh water and salt water contain varying amounts of dissolved materials, particulates and biological components; and interpret information on these component materials			• investigate and illustrate the contributions of technological advances —including optical telescopes, spectral analysis and space travel —to a scientific understanding of space • describe, in general terms, the distribution of matter in star systems, galaxies, nebulae and the universe as a whole

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• identify and explain the purpose of different tools and techniques used in the study of Earth (e.g., describe and explain the use of seismographs and coring drills, as well as tools and techniques for the close examination of rocks; describe methods used in oil and gas exploration)	• 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)	• identify evidence for, and describe characteristics of, bodies that make up the solar system; and compare their composition and characteristics with those of Earth
• explain the need for common terminology and conventions in describing rocks and minerals, and apply suitable terms and conventions in describing sample materials (e.g., use common terms in describing the lustre, transparency, cleavage and fracture of rocks and minerals; apply the Mohs' scale in describing mineral hardness)	• describe, in general terms, methods for generating fresh water from salt water, based on evaporation, distillation and reverse osmosis	• describe and apply techniques for determining the position and motion of objects in space, including: – constructing and interpreting drawings and physical models that illustrate the motion of objects in space (e.g., represent the orbit of comets around the Sun, using a looped-string model) – describing in general terms how parallax and the Doppler effect are used to estimate distances of objects in space and to determine their motion – describing the position of objects in space, using angular coordinates (e.g., describe the location of a spot on a wall, by identifying its angle of elevation and its bearing or azimuth; describe the location of the Sun and other stars using altitude-azimuth coordinates, also referred to as horizon coordinates or local coordinates) [Note: A description of star positions based on right ascension and declination is not required.]
		• investigate predictions about the motion, alignment and collision of bodies in space (e.g., investigate predictions about eclipses; identify uncertainties in predicting and tracking meteor showers)
2. Identify evidence for the rock cycle, and use the rock cycle concept to interpret and explain the characteristics of particular rocks	2. Investigate and interpret linkages among landforms, water and climate	2. Identify problems in developing technologies for space exploration, describe technologies developed for life in space, and explain the scientific principles involved
• distinguish between rocks and minerals	• 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 • investigate and describe stream characteristics (e.g., describe the slope, flow rate and stream profile characteristics of a model stream on a stream table)	• analyze space environments, and identify challenges that must be met in developing life-supporting systems (e.g., analyze implications of variations in gravity, temperature, availability of water, atmospheric pressure and atmospheric composition) • describe technologies for life-support systems, and interpret the scientific principles on which they are based (e.g., investigate systems that involve the recycling of water and air)
• describe characteristics of the three main classes of rocks—igneous, sedimentary and metamorphic—and describe evidence of their formation (e.g., describe evidence of igneous rock formation, based on the study of rocks found in and around volcanoes; describe the role of fossil evidence in interpreting sedimentary rock)	• 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)	• describe technologies for space transport, and interpret the scientific principles involved (e.g., describe the development of multistage rockets, shuttles and space stations; build a model vehicle to explore a planet or moon)
• describe local rocks and sediments, and interpret ways they may have formed • investigate and interpret examples of weathering, erosion and sedimentation	• 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)	• identify materials and processes developed to meet needs in space, and identify related applications (e.g., medicines, remote sensing, microelectronics, polymers, medical imaging, wireless communication technologies, synthesis of fuels)
	• 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)	• describe the development of artificial satellites, and explain the major purposes for which they are used (e.g., communication, GPS—global positioning system, weather observation)
3. Investigate and interpret evidence of major changes in landforms and the rock layers that underlie them	3. Analyze factors affecting productivity and species distribution in marine and freshwater environments	3. Describe and interpret the science of optical and radio telescopes, space probes and remote sensing technologies
• investigate and interpret patterns in the structure and distribution of mountain formations (e.g., describe and interpret mountain formations of the North American cordillera) • interpret the structure and development of fold and fault mountains	• 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)	• explain, in general terms, the operation of optical telescopes, including telescopes that are positioned in space environments
• describe evidence for crustal movement, and identify and interpret patterns in these movements (e.g., identify evidence of earthquakes and volcanic action along the Pacific Rim; identify evidence of the movement of the Pacific plate relative to the North American plate)	• analyze factors that contribute to the development of adaptations in species found in saltwater and freshwater environments • 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)	• explain the role of radio and optical telescopes in determining characteristics of stars and star systems • describe and interpret, in general terms, the technologies used in global positioning systems and in remote sensing (e.g., use triangulation to determine the position of an object, given information on the distance from three different points) [Note: This example involves the use of geometric approaches rather than mathematical calculations.]
• identify and interpret examples of gradual/incremental change, and predict the results of those changes over extended periods of time (e.g., identify evidence of erosion, and predict the effect of erosional change over a year, century and millennium; project the effect of a given rate of continental drift over a period of one million years)	• analyze relationships between water quality and living things, and infer the quality of water based on the diversity of life supported by it	

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4. Describe, interpret and evaluate evidence from the fossil record	4. Analyze human impacts on aquatic systems; and identify the roles of science and technology in addressing related questions, problems and issues	4. Identify issues and opportunities arising from the application of space technology, identify alternatives involved, and analyze implications
• describe the nature of different kinds of fossils, and identify hypotheses about their formation (e.g., identify the kinds of rocks where fossils are likely to be found; identify the portions of living things most likely to be preserved; identify possible means of preservation, including replacement of one material by another and formation of molds and casts)	• 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)	• recognize risks and dangers associated with space exploration (e.g., space junk, fuel expenditure, satellites burning up in the atmosphere, solar radiation)
• explain and apply methods used to interpret fossils (e.g., identify techniques used for fossil reconstruction, based on knowledge of current living things and findings of related fossils; identify examples of petrified wood and bone) • describe patterns in the appearance of different life forms, as indicated by the fossil record (e.g., construct and interpret a geological time scale; and describe, in general terms, the evidence that has led to its development)	• 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)	• describe Canadian contributions to space research and development and to the astronaut program (e.g., Canadarm) • identify and analyze factors that are important to decisions regarding space exploration and development (e.g., identify examples of costs and potential benefits that may be considered; investigate and describe political, environmental and ethical issues related to the ownership and use of resources in space)
• identify uncertainties in interpreting individual items of fossil evidence; and explain the role of accumulated evidence in developing accepted scientific ideas, theories and explanations	• 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)	
Specific Outcomes for Skills	**Specific Outcomes for Skills**	**Specific Outcomes for Skills**
Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions	Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions
• identify questions to investigate (e.g., How are rocks formed?)	• identify science-related issues and problems	• identify practical problems (e.g., identify problems that must be addressed in developing a lifesupporting space environment)
• define and delimit questions to facilitate investigation (e.g., ask a question about a sample group of rocks from a specific region, or about a specific type of rock or rock formation)	• identify questions to investigate, arising from science-related issues	• propose alternative solutions to a given practical problem, select one, and develop a plan (e.g., design and describe a model of a technology to be used in a space station)
• state a prediction and a hypothesis based on background information or an observed pattern of events (e.g., predict where an outcrop of a given rock will appear, based on observations at nearby sites)	• 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)	• state a prediction and a hypothesis based on background information or an observed pattern of events (e.g., predict the next appearance of a comet, based on past observations; develop a hypothesis about the geologic history of a planet or its moon, based on recent data)
• formulate operational definitions of major variables and other aspects of their investigations (e.g., define hardness by reference to a set of mineral samples, or by reference to the Mohs' scale of hardness)	• design an experiment, and identify the major variables (e.g., design an experiment to compare the characteristics of two water samples)	
Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	Performing and Recording Students will:Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data	Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data
• carry out procedures, controlling the major variables	• research information relevant to a given issue	• research information relevant to a given problem
• estimate measurements (e.g., estimate the thickness of sedimentary layers) • research information relevant to a given question (e.g., research information regarding the effect of acid rain on the rate of rock weathering)	• 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)	• select and integrate information from various print and electronic sources or from several parts of the same source (e.g., compile and compare information about two exploratory missions)
• select and integrate information from various print and electronic sources or from several parts of the same source (e.g., demonstrate proficiency in uploading and downloading text, image, audio and video files)	• 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)	• organize data, using a format that is appropriate to the task or experiment (e.g., maintain a log of observed changes in the night sky; prepare a data table to compare various planets)
• organize data, using a format that is appropriate to the task or experiment (e.g., use diagrams to show the shape and thickness of different layers in a rock outcrop)		
Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations	Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations	Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations
• use or construct a classification key (e.g., apply a classification key to identify a group of rocks from a local gravel yard)	• apply given criteria for evaluating evidence and sources of information (e.g., assess the authenticity and reliability of electronic sources)	• test the design of a constructed device or system (e.g., create and test a model device for remote manipulation of materials)

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• interpret patterns and trends in data, and infer and explain relationships among the variables (e.g., interpret example graphs of seismic data, and explain the lag time between data received at different locations)	• 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)	• identify and correct practical problems in the way a prototype or constructed device functions (e.g., identify and correct problems in the functioning of a model "remote transportation device" that they have designed and built)
• predict the value of a variable, by interpolating or extrapolating from data (e.g., determine, in a stream table study, the quantity of sediment carried over a half-hour period, then extrapolate the amount that would be carried if the time were extended to a day, month, year or millennium)	• 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 the strengths and weaknesses of different methods of collecting and displaying data (e.g., compare Earth-based observations with those made from spacecraft)
• identify and suggest explanations for discrepancies in data (e.g., suggest explanations for an igneous rock being found in a sedimentary formation) • identify new questions and problems that arise from what was learned (e.g., identify new questions that arise after learning about plate tectonics)	• 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?")	• identify new questions and problems that arise from what was learned (e.g., identify questions to guide further investigation, such as: "What limits the travelling distance and duration of space exploration?", "How old are the planets, and how did they form?")
Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results	Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results
• work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise (e.g., each group member is assigned a task to investigate a particular mineral, and the results are pooled in a common data table)	• 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)	• receive, understand and act on the ideas of others (e.g., take into account advice provided by other students or individuals in designing a model space suit or space vehicle) • work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise (e.g., write and act out a skit to demonstrate tasks carried out by astronauts on a mission)
• evaluate individual and group processes used in planning, problem solving, decision making and completing a task (e.g., evaluate the relative success and scientific merits of an Earth science field trip organized and guided by themselves)	• 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)	• defend a given position on an issue or problem, based on their findings (e.g., conduct appropriate research to justify their position on the economic costs or benefits of space exploration)
	• 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	**Specific Outcomes for Attitudes**	**Specific Outcomes for Attitudes**
Interest in Science Students will be encouraged to: Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., recognize potential careers related to Earth science fields; pursue interests in rocks, through museum visits, personal collections or recreational reading)	Interest in Science Students will be encouraged to: 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)	Interest in Science Students will be encouraged to: Show interest in science-related questions and issues, and confidently pursue personal interests and career possibilities within science-related fields (e.g., express interest in and describe media programs on space science and technology; take an interest in directly observing and interpreting space environments and in personal and group excursions to a space science centre)
Mutual Respect Students will be encouraged to: Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., appreciate the idea of "Mother Earth," and recognize different forms of this idea developed by different cultures; recognize the role of legend and myth in conveying understandings about Earth; recognize that scientific ideas about Earth have developed over time)	Mutual Respect Students will be encouraged to: 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)	Mutual Respect Students will be encouraged to: Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., show an interest in the contributions that women and men from many cultural backgrounds have made to the development of modern science and technology)
Scientific Inquiry Students will be encouraged to: Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., critically evaluate inferences and conclusions, basing their arguments on facts rather than opinions; identify evidence to support ideas; take the time to accurately gather evidence and use instruments carefully)	Scientific Inquiry Students will be encouraged to: 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)	Scientific Inquiry Students will be encouraged to: Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., seek accurate data that is based on appropriate methods of investigation; consider observations and ideas from a number of sources before drawing conclusions)
Collaboration Students will be encouraged to: Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., listen to the ideas and points of view of others; consider alternative ideas and interpretations suggested by members of the group)	Collaboration Students will be encouraged to: 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)	Collaboration Students will be encouraged to: Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., work with others to identify problems and explore possible solutions; share observations and ideas with other members of the group, and consider alternative ideas suggested by other group members; share the responsibility for carrying out decisions)
Stewardship Students will be encouraged to: Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., recognize that fossils are a part of public heritage and that they should not be defaced or removed from where they are found; consider the needs of other people and the precariousness of the environment when making decisions and taking action)	Stewardship Students will be encouraged to: 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)	Stewardship Students will be encouraged to: 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 Students will be encouraged to: Show concern for safety in planning, carrying out and reviewing activities (e.g., wear safety goggles when testing the cleavage or fracture of rocks; ensure the proper disposal of materials)	Safety Students will be encouraged to: 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)	Safety Students will be encouraged to: 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)

Grade 10 - 12 Essential Assessments and Forms of Differentiation

Grade 10 – 12 Subject Areas

Diagnostic pre assessment is relevant and reliable and can assist teachers to identify skill/knowledge gaps and to respond in a flexible and effective manner.
The Math MIPI and English RCAT diagnostic can be expanded and used.
Math MIPI used for grade 9 & 10 students. The MIPI 10 can be given to grade 11 students as well as in their grade 10 year.

English RCAT has a reliable Alberta curriculum based diagnostic testing protocol to use with students from grades 9 through 12 for English and help inform skill development in Social Studies.

Sciences will have a separate diagnostic test to determine specific skill gaps that may exist for students to achieve success in the biology/chemistry/physics paths in grades 11 & 12.

Diagnostic pre-assessments will be performed in September.

Having this early pre-assessment will assist teacher to plan for provincial assessments and demonstrate the use of a variety of assessment strategies to support learning for all scenarios.

Differentiation:

Pre-assessments are used to address learning gaps in a specific and deliberate manner.

Spiraling curriculum will be a main strategy whereby intentional teaching, reteaching, quizzing and re-quizzing essential outcomes occurs so that students have multiple opportunities to recall and use learning throughout the course. Repeatedly asking students to reproduce skill- based activities is essential for long term memory and retention of skills. This strategy is used over multiple courses and will be effective for students who may have missed content and skills over the last few months of the 2019-2020 school year.

Teachers will look for trends and build in methods for examining skills students use from the pre-assessments. Data walls will be used to track student growth in specific skills and outcomes.
Collaboration among teachers is critical to understanding student learning behaviours in different learning environments.

Specific subject areas:

Subject	Pre Assessment	Differentiation
Math	• Grade 9 essential outcomes • MIPI grade 9 and 10	• Develop student relationships and address social-emotional needs • Cumulative file review
English	• Use existing benchmarks to address essential outcomes • Reading benchmarks • Teacher diagnostic	• Driven by benchmarks • When gaps are encountered students will be directed to resources. • Time will be built into the course to address gaps and tie to metacognitive outcomes.

Subject	Pre Assessment	Differentiation
English	• OCA • Released PATs • Released DIPs • Student self-assessments	• Flexibility with work submission allowing teachers and students time to • Teaching partnerships/coteaching • Data wall to track student progress
Social Studies	*metacognition thread from Grade nine • Reading comprehension and writing benchmarks (source analysis) • Combine benchmarks with ELA to reduce assessment fatigue • Grade 9 and – 2 exams • Prioritize skills over Knowledge outcomes. **Example:** Grade 9 Economics/Scarcity -> grade 10 "2.9 examine multiple perspectives on the political, economic and social impacts of historical globalization and imperialism (I, LPP, PADM)" "2.13 examine legacies of historical globalization and imperialism that continue to influence globalization (TCC, GC)"	• Online Google Meets – collaborative process with grade level partners to ensure everyone is meeting the standards and targets for students, sharing classrooms with teaching partners • Regular check-ins with students • Emphasize formative skills building
Science	Training: practical and purposeful training in the protocol in respect to sanitizing lab equipment, lab protective wear and student use of materials. • Spiral Method • Science 14/24 – full reteach at a pace dictated by students • Review of the standards from grade 9 • Review of math skills • Review of stoichiometry/titrations and associated skills	• Spiral approach – will allow for identification and addressing gaps in learning. This approach will allow for remediation of content by students that did not show a gap in learning. • Remedial online instruction for students who request it. • Cross curricular exposure in mathematics.
CTS	• Fill in gaps as necessary French: • Review materials to get most students at or close to grade level. Foods: • Students are assessed at beginning of course	• Goal is to plan and meet every student where they are and move forward • Adapt lessons as students move at their own pace • If need be, outcomes are retaught to build confidence and comfort
Phys Ed	• Consistent use of the Backwards by Design" model to assess the level that students are at and adjust our activities and pace for the remainder of the units. • Collaboration between colleagues to discuss student needs.	• Modified equipment • Modified rules • Culminating activities of choice • Wave pre-requisites for the next level courses such as Fitness 20, Outdoor Pursuits 20 etc.