

BC's Mathematics Curriculum: Thinking about Planning and Assessment

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FIRST PEOPLES PRINCIPLES OF LEARNING

Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.

Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).

Learning involves recognizing the consequences of one's actions.

Learning involves generational roles and responsibilities.

Learning recognizes the role of indigenous knowledge.

Learning is embedded in memory, history, and story.

Learning involves patience and time.

Learning requires exploration of one's identity.

Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.

For First Peoples classroom resources visit: www.fncsc.ca



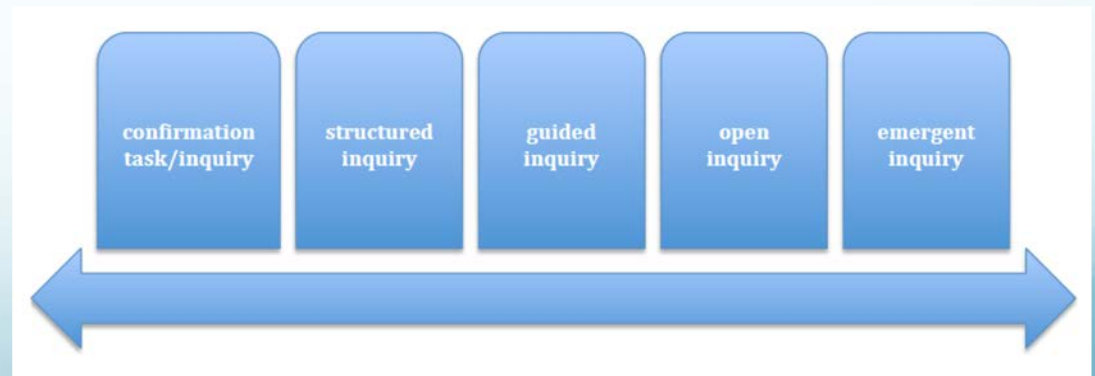
Core Competencies

• Flexible Learning Environments

BC's redesigned curriculum provides teachers with great flexibility in creating learning environments that are relevant, engaging, and novel. Flexible learning environments give consideration to local contexts and place-based learning.



eportfolio



- What is numeracy?
- Numeracy is the ability, willingness, and perseverance to interpret and apply mathematical understanding to solve problems in contextualized situations, and to analyze and communicate these solutions in ways relevant to the given context.

Big Ideas - Elaborations

The image is a screenshot of a Mathematics curriculum page for grade 4. At the top, the word "Mathematics" is written in a large, white, sans-serif font. To its right, the grade levels "K 1 2 3 4 5 6 7 8 9" are listed, with the number "4" being significantly larger and bolder than the others. Below the title, there is a navigation bar with links for "Introduction", "Goals and Rationale", "What's New", and "Curriculum Overview".

Underneath the navigation bar, the section "Core Competencies" is highlighted. It features three white triangles, each containing a letter: "C" for Communication, "T" for Thinking, and "PS" for Personal & Social. Below each triangle is its corresponding label.

The "Big Ideas" section is located below the core competencies. It consists of three white circles, each containing a paragraph of text. The first circle on the left discusses fractions and decimals as types of numbers. The second circle at the bottom discusses analyzing and interpreting experiments in data probability. The third circle on the right discusses polygons as closed shapes with similar attributes. A central grey box contains a list of sample questions to support inquiry with students, which are related to the first circle's content.

Mathematics K 1 2 3 **4** 5 6 7 8 9

Introduction | Goals and Rationale | What's New | Curriculum Overview

Core Competencies

- C** Communication
- T** Thinking
- PS** Personal & Social

Big Ideas

- Fractions and decimals are types of **numbers** that can represent quantities.
- Analyzing and interpreting experiments in **data** probability develops an understanding of chance.
- Polygons are closed shapes with similar **attributes** that can be described, measured, and compared.

- Number: Number represents and describes quantity.
- Sample questions to support inquiry with students:
 - What is the relationship between fractions and decimals?
 - How are these fractions (e.g., $1/2$ and $7/8$) alike and different?
 - How do we use fractions and decimals in our daily life?
 - What stories live in numbers?
 - How do numbers help us communicate and think about place?
 - How do numbers help us communicate and think about ourselves?

Learning Standards: Curricular Competencies & Content

Learning Standards

Curricular Competencies

Students are expected to be able to do the following:

Reasoning and analyzing

- ▶ Estimate reasonably
- ▶ Develop mental math strategies and abilities to make sense of quantities
- ▶ Use reasoning and logic to explore and make connections

Understanding and solving

- ▶ Using **multiple strategies** to engage in problem solving
- ▶ Develop, construct, and apply mathematical understanding through role-play, inquiry, and problem solving
- ▶ Engage in problem-solving experiences that are connected to place, story, and cultural practices relevant to the local community

Communicating and representing

- ▶ **Communicate** in many ways
- ▶ Describe, create, and interpret relationships through concrete, pictorial, and symbolic representations
- ▶ Use **technology** appropriately to explore mathematics, solve problems, record, communicate, and represent thinking

Connecting and reflecting

- ▶ Visualize and describe mathematical concepts
- ▶ Connect mathematical concepts to each other and make **mathematical connections** to the real world
- ▶ Share and reflect upon mathematical thinking
- ▶ Draw upon local First Peoples knowledge and/or expertise of local Elders to make connections to mathematical topics and concepts

Content

Students are expected to know the following:

- ◆ number concepts to 10 000
- ◆ decimals to hundredths
- ◆ ordering and comparing fractions
- ◆ addition and subtraction to 10 000
- ◆ multiplication and division of two- or three-digit numbers by one-digit numbers
- ◆ addition and subtraction of decimals to hundredths
- ◆ addition and subtraction facts to 20 (developing computational fluency)
- ◆ multiplication and division facts to 100 (introductory computational strategies)
- ◆ increasing and decreasing patterns, using tables and charts
- ◆ algebraic relationships among quantities
- ◆ one-step equations with an unknown number using all operations
- ◆ how to tell time with analog and digital clocks, using 12- and 24-hour clocks
- ◆ regular and irregular polygons

Planning

- Planning through Big Ideas or Curricular Competencies
 - focus on what students are learning
- Mathematics – one hour a day
- Numeracy experiences throughout day, connected to other curricular areas



● bcnumeracynetwork.ca

Planning a Balanced Numeracy Program

- Connecting the dots through big ideas...
 - individual, small group, whole class
 - weaving together competencies and content
 - instructional routines
 - practice
 - provocations and projects
- *What might a learning map of a week look like?*

Concept: Decomposing

Grades 1&2

Monday	Tuesday	Wednesday	Thursday	Friday
<p>Read 12 Ways to Make 11 by Eve Merriam, stop and predict</p> <p>Marian Small question: Choose a number between 10-100. Decompose it as many ways as you can. Share how each way helps you think about the number.</p>	<p>Math Routine: Splat!</p> <p>Math Workshop: Splat! Make 10 or 20 game with ten frames Adding with decomposing strategies Small group: choose a quantity, decompose into 2, 3, 4, 5+ parts; visualize</p>	<p>Investigating with materials</p> <p><i>What is decomposing? What materials help you think about decomposing? What are different ways to decompose? How will you show what you know? What questions do you still have?</i></p>	<p>Math Routine: Quick Images with ten frames</p> <p>Math Workshop: Same as Tuesday, add Find Sums App with 10, 20 or 100 frame Small group: mini number talks focus on addition strategies with decomposing</p>	<p>Math Routine: Number Talk – addition strategies with decomposing</p> <p>CGI problem or Marian Small question, ten frame games, performance task for assessment</p>

Concept: Fractions

Grades 4&5

Monday	Tuesday	Wednesday	Thursday	Friday
<p>Read The Lion's Share, stop and predict, give each child a piece of origami paper to use while reading</p> <p>Marian Small question: When is $\frac{1}{2}$ a lot of something? When is it not? Use concrete, pictorial and symbolic forms.</p>	<p>Math Routine: Fraction Talk</p> <p>Math Workshop: Fraction talk image</p> <p>Fraction circles and bars and symbolic notation</p> <p>Fraction puzzles</p> <p>Small group: represent $\frac{1}{4}$ in different ways</p>	<p>Investigating with materials</p> <p><i>How are fractions and decimals related?</i></p> <p><i>What materials help you think about fractions? How will you show what you know? What questions do you still have?</i></p>	<p>Math Routine: Clothesline - fractions</p> <p>Math Workshop: Same as Tuesday, add Equivalent Fractions App</p> <p>Small group: comparing and ordering fractions, intro to equivalent fractions for some</p>	<p>Math Routine: Clothesline - fractions and decimals (add some equivalents)</p> <p>Investigating with materials, Marian Small question, fraction puzzles and games, performance task for assessment</p>

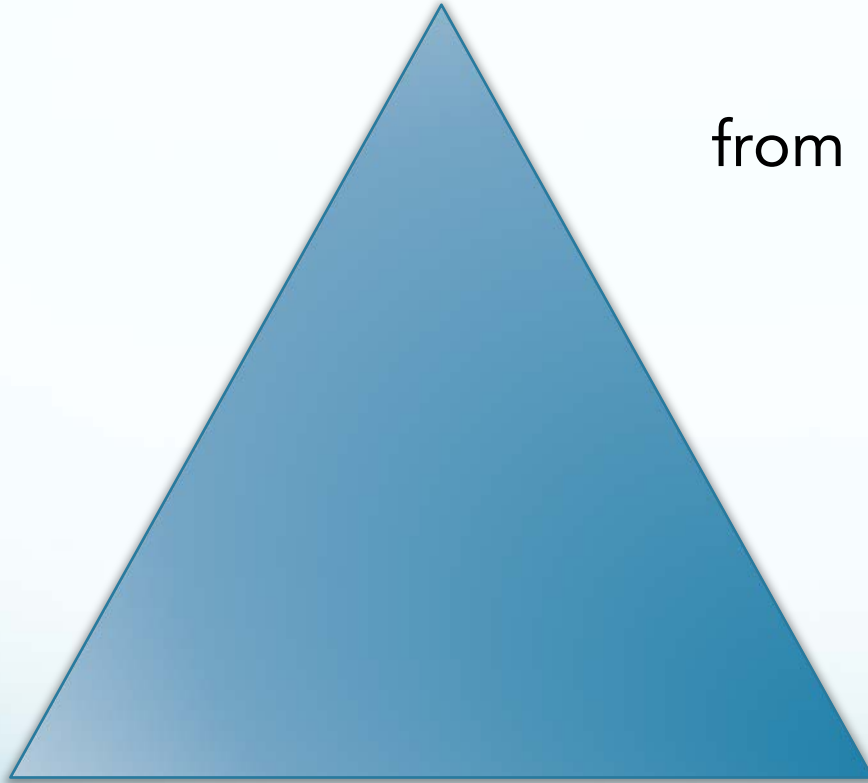
A Year Plan

- Begin year with “what is math?” and developing mathematical community & discourse
- Consider: core foundational content, new concepts for the grade, balancing number and spatial concepts, connections, looping/interleaving
- Number concepts and operations need the most dedicated time over the year
- Consider which curricular competencies complement curricular content

Term One	Term Two	Term Three

Assessment

observations




from Rethinking Letter Grades
by Caren Cameron &
Kathleen Gregory

product

talk

(discussions, conversations, interviews)

Proficiency Scale



Emerging	Developing	Proficient	Extending
The student demonstrates an initial understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a partial understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a complete understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a sophisticated understanding of the concepts and competencies relevant to the expected learning.

Term 1

Big Idea: Number represents and describes quantity.

Grade 2 Big Idea: Numbers to 100 represent quantities that can be decomposed into tens and ones.

Grade 3 Big Idea: Numbers to 1000 represent quantities that can be decomposed into hundreds, tens and ones.

What is decomposing? How does decomposing help us think about numbers?

How can shapes be decomposed? How can fractions be decomposed?

How does understanding 5 or 10 help us think about other numbers?

Grade 2	Decompose single digit numbers into parts in multiple ways	Decompose two-digit numbers into parts (tens and ones)	Represent decomposing of two-digit numbers in multiple forms (concrete, pictorial, symbolic) - using tens or other benchmark numbers	Develop mental math strategies by applying concept of decomposing to + & - facts to 20	Develop and use multiple strategies to apply concept of decomposing to addition and subtraction to 100, including problem solving
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Grade 3	Decompose two-digit and three-digit numbers in	Represent decomposing of three-digit numbers into parts by place value in multiple forms (concrete, pictorial, symbolic) - hundreds, tens & ones and other benchmark numbers	Develop mental math strategies by applying concept of decomposing to + & - facts to 20 - increasing	Develop and use multiple strategies to apply concept of decomposing to addition and subtraction to 1000 - including problem	Apply concept of decomposing to understanding of multiplication - grouping, arrays

- What connections are you making?
- What questions do you have?

