Mathematics Grades 6-9 Curriculum Continuum

Themes Across the Grades

	Number represents and describes quantity.	Developing computational fluency comes from a strong sense of number.	We use patterns to represent identified regularities and to form generalizations.	We can describe, measure, and compare spatial relationships.	Analyzing data and chance enables one to compare and interpret.

Competencies (all grades)

Reasoning and analyzing

- Use **logic and patterns** to solve puzzles and play games
- Use **reasoning and logic** to explore, analyze and apply mathematical ideas
- **Estimate reasonably**
- Demonstrate and **apply** mental math strategies
- Use tools or technology to explore and create patterns and relationships, and test conjectures
- **Model** mathematics in contextualized experiences

Understanding and solving

- Apply **multiple strategies** to solve problems in both abstract and contextualized situations
- Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
- Visualize to explore mathematical concepts

Understanding and solving

- Engage in problem-solving experiences that are **connected** to place, story, cultural practices and perspectives relevant to local First Peoples communities, the local community, as well as other cultures

Communicating and representing

- Use mathematical vocabulary and language to contribute to mathematical discussions
- **Explain and justify** mathematical ideas and decisions
- **Communicate** mathematical thinking in many ways
- Represent mathematical ideas in concrete, pictorial, and symbolic forms

Connecting and reflecting

- **Reflect** upon mathematical thinking
- Connect mathematical concepts to each other, and to **other areas and personal interests**
- Use mathematical arguments to support **personal choices**
- **Incorporate First Peoples** worldviews and perspectives to **make connections** to mathematical concepts

BIG Ideas

Strand	Grade 6	Grade 7	Grade 8	Grade 9
Number	Mixed **numbers** and decimal numbers represent quantities which can be decomposed into parts and wholes.	Decimals, fractions, and percents are forms used to represent and describe parts and wholes of **numbers.**	Ratios, rates, and percents consist of **numbers** that express a comparison between quantities.	The principles and processes that underlie operations with **numbers** apply equally to algebraic situations and can be described and analyzed.
Fluency	Flexibility with numbers and computational **fluency** extends to operations with whole numbers and decimals.	Flexibility with numbers and computational **fluency** extends to operations with integers and decimals.	Flexibility with numbers and computational **fluency** extends to operations with fractions.	Flexibility with numbers and computational **fluency** extends to operations with rational numbers.
Patterns	**Patterns** in linear relations can be identified and represented using expressions with variables and line graphs.	**Patterns** in linear relations can be identified and represented in many connected ways.	**Patterns** in discrete linear relationships can be identified and represented in many connected ways.	**Continuous linear relationships** can be identified and represented in many connected ways to form generalizations.
Measurement	Properties of objects and shapes can be **described, measured, and compared** using volume, area, perimeter, and angles.	The ratio between the circumference and diameter of circles is constant and can be **described, measured, and compared**.	Surface area and volume of 3D objects are related and can be **described, measured, and compared**.	Similar shapes have proportional **comparisons** between their attributes.
Probability	The results of an experiment can be used to **predict** the theoretical probability of an event.	Circle graphs are a visual representation that illustrates proportion and can be used to **analyze, compare, and interpret** data and chance.	Determining averages is one way of making sense of large data sets through **comparing and interpreting**.	The validity and reliability of data and how it is represented needs to be **analyzed, compared, and interpreted** critically.

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Content Continuum				
strand	**Grade 6**	**Grade 7**	**Grade 8**	**Grade 9**
 Number	• **small to large numbers** (thousandths to billions) • multiplication and division **facts to 100** (developing computational fluency) • **order of operations** with whole numbers • **factors and multiples,** greatest common factor and least common multiple • **improper fractions** and mixed numbers • Introduction to **ratios** • whole number **percents** and percentage discounts • multiplication and division of **decimals**	• multiplication and division **facts to 100** (extending computational fluency) • **operations with integers** (addition, subtraction, multiplication, division, and order of operations) • **operations with decimals** (addition, subtraction, multiplication, division, and order of operations) • **relationship** between decimals, fractions, ratios, and percents	• **perfect squares and cubes** • **square and cube roots** • **percents** less than 1 and greater than 100 (decimal and fractional percents) • numerical **proportional reasoning (**rates, ratio, proportions, and percent) • operations with **fractions** (addition, subtraction, multiplication, division, and order of operations)	• **operations** with rational numbers (addition, subtraction, multiplication, division, and order of operations) • **exponents** and exponent laws with whole number exponents
Expressions and Equations	• increasing and decreasing **patterns** using expressions as functional relationships • **one-step equations** with whole-number coefficients and solutions	• **two-step equations** with whole number coefficients, constants, and solutions	• **expressions**, writing and evaluating using substitution • **two-step equations** with integer coefficients, constants, and solutions	• operations with **polynomials**, of degree less than or equal to two • **multi-step** one-variable linear equations
Linear Relations	• increasing and decreasing **patterns,** using expressions, tables, and graphs as functional relationships • combinations of **transformations** • **line graphs**	• **discrete linear relations**, using expressions, tables, and graphs • **Cartesian coordinates** and graphing • combinations of **transformations**	• **discrete linear relations** (extended to larger numbers, limited to integers)	• **two-variable linear relations,** using graphing, interpolation, and extrapolation
Shape and Space	• **perimeter** of complex shapes • **area** of triangles, parallelograms, and trapezoids • **angle measurement** and classification • **volume and capacity** • **triangles**	• **circumference** and area of circles • **volume** of rectangular prisms and cylinders • **circle graphs**	• **surface area and volume** of regular solids, including triangular and other right prisms and cylinders • **Pythagorean theorem** • construction, views, and nets of **3D objects**	• spatial **proportional reasoning** (e.g., scale diagrams, similar triangles, linear unit conversions)
Probability	• **single-outcome probability**, both theoretical and experimental	• **experimental probability** with two independent events	• **central tendency** • **theoretical probability** with two independent events	• **statistics** in society
Financial Literacy	• **financial literacy** – simple budgeting and consumer math	• **financial literacy** – financial percentage	• **financial literacy** – best buys	• **financial literacy** – simple budgets and transactions

Curricular Competencies Gr 6-9	
Reasoning and analyzing • Use **logic and patterns** to solve puzzles and play games • Use **reasoning and logic** to explore, analyze and apply mathematical ideas • **Estimate reasonably** • Demonstrate and **apply** mental math strategies • Use tools or technology to explore and create patterns and relationships, and test conjectures • **Model** mathematics in contextualized experiences **Understanding and solving** • Apply **multiple strategies** to solve problems in both abstract and contextualized situations • Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving • Visualize to explore mathematical concepts • Engage in problem-solving experiences that are **connected** to place, story, cultural practices and perspectives relevant to local First Peoples communities, the local community, as well as other cultures **Communicating and representing** • Use mathematical vocabulary and language to contribute to mathematical discussions • **Explain and justify** mathematical ideas and decisions • **Communicate** mathematical thinking in many ways • Represent mathematical ideas in concrete, pictorial, and symbolic forms **Connecting and reflecting** • **Reflect** upon mathematical thinking • Connect mathematical concepts to each other, and to **other areas and personal interests** • Use mathematical arguments to support **personal choices** • **Incorporate First Peoples** worldviews and perspectives to **make connections** to mathematical concepts	**logic and patterns:** Includes coding **reasoning and logic:** Making connections, inductive and deductive reasoning, predicting, generalizing, drawing conclusions through experiences **Estimate reasonably:** Estimate using referents, approximation, and rounding **apply:** Extend whole number strategies to Gr 6: decimals, Gr 7: integers, Gr 8: decimals/fractions, Gr 9: rational numbers and algebraic expressions Working towards developing fluent and flexible thinking of number **Model**: act it out, use concrete materials (e.g., manipulatives), draw pictures or diagrams, build, program **http://www.nctm.org/Publications/teaching-children-mathematics/2005/Vol12/Issue3/Problem-Posing-and-Solving-with-Mathematical-Modeling/** **multiple strategies:** includes familiar, personal, and from other cultures **connected:** in daily activities, local and traditional practices, the environment, popular media and news events, cross-curricular integration patterns are important in Aboriginal technology, architecture, and artwork have students pose and solve problems or questions connected to place, stories, and cultural practices **Explain and justify:** Use mathematical arguments **Communicate:** concretely, pictorially, symbolically, and by using spoken or written language to express, describe, explain, justify and apply mathematical ideas; may use technology such as screen casting apps, digital photos **Reflect:** Share the mathematical thinking of self and others, including evaluating strategies and solutions, extending, posing new problems and questions **other areas and personal interests:** to develop a sense of how mathematics helps us understand ourselves and the world around us. e.g.,cross-discipline, daily activities, local and traditional practices, the environment, popular media and news events, and social justice **personal choices:** Includes anticipating consequences **Incorporate First Peoples:** e.g.,Draw upon the expertise of local Elders or knowledge keepers **make connections:** for example, Bishop's cultural practices: counting, measuring, locating, designing, playing, explaining FNESC Place-Based Themes and Topics: family & ancestry; travel & navigation; games; land, environment & resource management; community profiles; artwork; nutrition; dwellings (http://www.fnesc.ca/resources/math-first-peoples/)