Correlation of the British Columbia Mathematics Curriculum with Mathology Grade 9

Learning Standards	Grade 9 Mathology.ca	Pearson Canada Grades 4–9 Mathematics Learning Progression
Content - Elaborations		
operations with rational numbers (addition, subtraction, multiplication, division, and order of operations) • includes brackets and exponents • simplifying $(-3/4) \div 1/5 + ((-1/3) \times (-5/2))$ • simplifying $1 - 2 \times (4/5)^2$ • paddle making	**Number Unit 4: Fluency with Rational Numbers** 12: Operations with Positive and Negative Fractions and Decimals 13: Order of Operations with Rational Numbers	**Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Developing Fluency of Operations** - Uses reasoning, estimation, efficient strategies, and algorithms to operate on positive and negative rational numbers. **Investigating Number and Arithmetic Properties** - Applies order of operations to equations involving exponents to evaluate expressions.
exponents and exponent laws with whole-number exponents • includes variable bases • $2^7 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 128$; $n^4 = n \times n \times n \times n$ • exponent laws (e.g., $6^0 = 1$; $m^1 = m$; $n^5 \times n^3 = n^8$; $y^7/y^3 = y^4$; $(5n)^3 = 5^3 \times n^3 = 125n^3$; $(m/n)^5 = m^5/n^5$; and $(3^2)^4 = 3^8$) • limited to whole-number exponents and whole-number exponent outcomes when simplified • $(-3)^2$ does not equal -3^2 • $3x(x - 4) = 3x^2 - 12x$	**Number Unit 3: Powers and Exponents** 6: Exploring Whole-Number Exponents 10: Exploring Exponent Laws	**Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Investigating Number and Arithmetic Properties** - Distinguishes between and investigates properties of prime and composite numbers (e.g., prime factorization). - Extends exponent notation to any repeated multiplication (e.g., $2 \times 2 \times 2 \times 2 = 2^4$) and evaluates expressions using exponents (e.g., $3^4 = 3 \times 3 \times 3 \times 3 = 81$).

operations with polynomials, of degree less than or equal to 2 • variables, degree, number of terms, and coefficients, including the constant term • $(x^2 + 2x – 4) + (2x^2 – 3x – 4)$ • $(5x – 7) – (2x + 3)$ • $2n(n + 7)$ • $(15k^2 –10k) ÷ (5k)$ • using algebra tiles	**Algebra Unit 1: Algebraic Expressions** 1: Representing and Evaluating Polynomials 3: Adding and Subtracting Polynomial Expressions 4: Multiplying and Dividing Polynomial Expressions	**Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.** **Representing Patterns, Relations, and Functions** - Represents a mathematical context or problem with expressions and equations using variables to represent unknowns. **Big Idea: Patterns and relations can be represented with symbols, equations, and expressions.** **Using Variables, Algebraic Expressions, and Equations to Represent Mathematical Relations** - Extends understanding of algebraic expressions to include writing and evaluating expressions with polynomials of degree two (e.g., $3x^2 – 7$). **Understanding Equality and Inequality, Building on Generalized Properties of Numbers and Operations** - Applies arithmetic properties to operate on polynomial expressions and solve problems (e.g., find area of rectangle with sides of $3x$ and $4 + x$). (Limited to degrees of 2.)
two-variable linear relations, using graphing, interpolation, and extrapolation • two-variable continuous linear relations; includes rational coordinates • horizontal and vertical lines • graphing relation and analyzing • interpolating and extrapolating approximate values • spirit canoe journey predictions and daily checks	**Algebra Unit 2: Linear Relations** 6: Investigating Linear Relations 7: Graphing and Analyzing Linear Relations	**Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.** **Representing Patterns, Relations, and Functions** - Represents a mathematical context or problem with expressions and equations using variables to represent unknowns. - Models problems and solves linear relations with rational coefficients, variables, and constants in different forms. **Generalizing and Analyzing Patterns, Relations, and Functions** - Predicts the value of a given element in a numeric or shape pattern using pattern rules. - Approximates linear relation values between and beyond data through interpolation and extrapolation.
multi-step one-variable linear equations • includes distribution, variables on both sides of the equation, and collecting like terms • includes rational coefficients, constants, and solutions • solving and verifying $1 + 2x = 3 – 2/3(x + 6)$ • solving symbolically and pictorially	**Algebra Unit 5: Modelling and Solving Equations** 14: Modelling and Solving Linear Equations 15: Solving More Complex Linear Equations 16: Solving Linear Equations in Different Forms	**Big Idea: Patterns and relations can be represented with symbols, equations, and expressions.** **Understanding Equality and Inequality, Building on Generalized Properties of Numbers and Operations** - Solves linear relations with rational coefficients, constants, and solutions (e.g., $2/3m − 2 = −7/6$).

spatial proportional reasoning • scale diagrams, similar triangles and polygons, linear unit conversions • limited to metric units • drawing a diagram to scale that represents an enlargement or reduction of a given 2D shape • solving a scale diagram problem by applying the properties of similar triangles, including measurements • integration of scale for First Peoples mural work, use of traditional design in current First Peoples fashion design, use of similar triangles to create longhouses/models	**Geometry/Measurement** **Unit 2: Measurement of 2-D Shapes and Scale Drawings** 4: Investigating Similar Triangles and Similar Polygons 5: Drawing and Interpreting Scale Drawings	**Big Idea: 2-D shapes and 3-D solids can be analyzed and classified in different ways by their attributes.** **Investigating Geometric Attributes and Properties of 2-D Shapes and 3-D Solids** - Uses interior angle properties of polygons to solve problems and determine similarity. **Big Idea: 2-D shapes and 3-D solids can be transformed in many ways and analyzed for change.** **Exploring 2-D Shapes and 3-D Solids by Applying and Visualizing Transformations** - Investigates dilation as a form of transformation and creates scale drawings using scale factors.
statistics in society • population versus sample, bias, ethics, sampling techniques, misleading stats • analyzing a given set of data (and/or its representation) and identifying potential problems related to bias, use of language, ethics, cost, time and timing, privacy, or cultural sensitivity • using First Peoples data on water quality, Statistics Canada data on income, health, housing, population	**Data Unit 1: Data Analysis** 1: Collecting Data 2: Factors Affecting Data Collection 3: Single-Variable Data Displays	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness.** **Collecting Data and Organizing It into Categories** - Explores methods for collecting data from a population (e.g., census) and a representative sample of a population. - Critiques methods for selecting representative samples from a population (e.g., bias, ethics, cost, privacy). **Creating Graphical Displays of Collected Data** - Visually represents large-scale data (e.g., histograms, box plots).

financial literacy — simple budgets and transactions • banking, simple interest, savings, planned purchases • creating a budget/plan to host a First Peoples event	**Financial Literacy Unit 1: Making Financial Decisions** 3: Exploring Banking and Interest 5: Creating and Modifying a Budget	**Big Idea: Numbers are related in many ways.** **Using Ratios, Rates, Proportions, and Percents Creates a Relationship Between Quantities** - Explores percentage increase and percentage decrease to solve problems (e.g., calculating simple and compound interest). **Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Developing Fluency of Operations** - Solves whole number computation using efficient strategies (e.g., mental computation, algorithms, calculating cost of transactions and change owing, saving money to make a purchase).

The following lessons are not required, but recommended:

- Mathology 9 Algebra Unit 1: Algebraic Expressions, Lesson 2: Coding: Exploring Algebraic Expressions
- Mathology 9 Algebra Unit 1: Algebraic Expressions, Lesson 5: Mathematical Modelling: Top Ten
- Mathology 9 Data Management Unit 1: Data Analysis, Lesson 6: Mathematical Modelling: Oil Reserves