



Correlation of the Yukon Mathematics Curriculum with Mathology Grade 9

Learning Standards	Grade 9 Mathology.ca	Pearson Canada Grades 4–9 Mathematics Learning Progression
Content - Elaborations		
<p>operations with rational numbers (addition, subtraction, multiplication, division, and order of operations)</p> <ul style="list-style-type: none"> includes brackets and exponents simplifying $(-3/4) \div 1/5 + ((-1/3) \times (-5/2))$ simplifying $1 - 2 \times (4/5)^2$ paddle making 	<p>Number Unit 4: Fluency with Rational Numbers</p> <p>12: Operations with Positive and Negative Fractions and Decimals</p> <p>13: Order of Operations with Rational Numbers</p>	<p>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</p> <p>Developing Fluency of Operations</p> <ul style="list-style-type: none"> Uses reasoning, estimation, efficient strategies, and algorithms to operate on positive and negative rational numbers. <p>Investigating Number and Arithmetic Properties</p> <ul style="list-style-type: none"> Applies order of operations to equations involving exponents to evaluate expressions.
<p>exponents and exponent laws with whole-number exponents</p> <ul style="list-style-type: none"> 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 $3x(x - 4) = 3x^2 - 12x$ 	<p>Number Unit 3: Powers and Exponents</p> <p>6: Exploring Whole-Number Exponents</p> <p>10: Exploring Exponent Laws</p>	<p>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</p> <p>Investigating Number and Arithmetic Properties</p> <ul style="list-style-type: none"> 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., $3^4 = 3 \times 3 \times 3 \times 3 = 81$).

<p>operations with polynomials, of degree less than or equal to 2</p> <ul style="list-style-type: none"> variables, degree, number of terms, and coefficients, including the constant term $(x^2 + 2x - 4) + (2x^2 - 3x - 4)$ $(5x - 7) - (2x + 3)$ $2n(n + 7)$ $(15k^2 - 10k) \div (5k)$ using algebra tiles 	<p>Algebra Unit 1: Algebraic Expressions 1: Representing and Evaluating Polynomials 3: Adding and Subtracting Polynomial Expressions 4: Multiplying and Dividing Polynomial Expressions</p>	<p>Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically. Representing Patterns, Relations, and Functions</p> <ul style="list-style-type: none"> Represents a mathematical context or problem with expressions and equations using variables to represent unknowns. <p>Big Idea: Patterns and relations can be represented with symbols, equations, and expressions. Using Variables, Algebraic Expressions, and Equations to Represent Mathematical Relations</p> <ul style="list-style-type: none"> Extends understanding of algebraic expressions to include writing and evaluating expressions with polynomials of degree two (e.g., $3x^2 - 7$). <p>Understanding Equality and Inequality, Building on Generalized Properties of Numbers and Operations</p> <ul style="list-style-type: none"> 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.)
<p>two-variable linear relations, using graphing, interpolation, and extrapolation</p> <ul style="list-style-type: none"> 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 	<p>Algebra Unit 2: Linear Relations 6: Investigating Linear Relations 7: Graphing and Analyzing Linear Relations</p>	<p>Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically. Representing Patterns, Relations, and Functions</p> <ul style="list-style-type: none"> 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. <p>Generalizing and Analyzing Patterns, Relations, and Functions</p> <ul style="list-style-type: none"> 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.
<p>multi-step one-variable linear equations</p> <ul style="list-style-type: none"> 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 	<p>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</p>	<p>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</p> <ul style="list-style-type: none"> Solves linear relations with rational coefficients, constants, and solutions (e.g., $2/3m - 2 = -7/6$).

<p>spatial proportional reasoning</p> <ul style="list-style-type: none"> • 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 	<p>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</p>	<p>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</p> <ul style="list-style-type: none"> - Uses interior angle properties of polygons to solve problems and determine similarity. <p>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</p> <ul style="list-style-type: none"> - Investigates dilation as a form of transformation and creates scale drawings using scale factors.
<p>statistics in society</p> <ul style="list-style-type: none"> • 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 	<p>Data Unit 1: Data Analysis 1: Collecting Data 2: Factors Affecting Data Collection 3: Single-Variable Data Displays</p>	<p>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</p> <ul style="list-style-type: none"> - 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). <p>Creating Graphical Displays of Collected Data</p> <ul style="list-style-type: none"> - Visually represents large-scale data (e.g., histograms, box plots).

<p>financial literacy — simple budgets and transactions</p> <ul style="list-style-type: none"> • banking, simple interest, savings, planned purchases • creating a budget/plan to host a First Peoples event 	<p>Financial Literacy Unit 1: Making Financial Decisions 3: Exploring Banking and Interest 5: Creating and Modifying a Budget</p>	<p>Big Idea: Numbers are related in many ways. Using Ratios, Rates, Proportions, and Percents Creates a Relationship Between Quantities</p> <ul style="list-style-type: none"> - Explores percentage increase and percentage decrease to solve problems (e.g., calculating simple and compound interest). <p>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</p> <p>Developing Fluency of Operations</p> <ul style="list-style-type: none"> - 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).
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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