Correlation of the Yukon Mathematics Curriculum with Mathology Grade 8

Learning Standards	Grade 8 Mathology.ca	Pearson Canada Grades 4-9 Mathematics Learning Progression
Perfect squares and cubes: • using colour tiles, pictures, or multi-link cubes • building the number or using prime factorization	**Number Unit 1: Fluency with Whole Numbers and Integers** 1: Investigating Perfect Squares and Square Roots 2: Investigating Perfect Cubes and Cube Roots	**Big Idea: The set of real numbers is infinite.** **Extending whole number understanding to the set of real numbers** - Distinguishes between numbers that do and do not have whole number square roots. **Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Developing Conceptual Meaning of Operations** - Models and demonstrates an understanding of squares and square roots.
Square and cube roots • finding the cube root of 125 • finding the square root of 16/169 • estimating the square root of 30	**Number Unit 1: Fluency with Whole Numbers and Integers** 1: Investigating Perfect Squares and Square Roots 2: Investigating Perfect Cubes and Cube Roots	**Big Idea: The set of real numbers is infinite.** **Extending whole number understanding to the set of real numbers** - Distinguishes between numbers that do and do not have whole number square roots. **Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Developing Conceptual Meaning of Operations** - Models and demonstrates an understanding of squares and square roots.

Percents less than 1 and greater than 100 (decimal and fractional percents) • A worker's salary increased 122% in three years. If her salary is now $93,940, what was it originally? • What is ½% of 1 billion? • The population of Vancouver increased by 3.25%. What is the population if it was approximately 603,500 people last year? • beading	**Number Unit 2: Proportions, Ratios, Rates, and Percents** 11: Working with Whole Number Percents 12: Working with Fractional Percents 13: Solving Percent Problems	**Big Idea: Numbers are related in many ways.** **Using ratios, rates, proportions, and percents creates a relationship between quantities** - Understands the meaning of percents greater than 100% and less than 1%.
Numerical proportional reasoning (rates, ratio, proportions, and percent): • two-term and three-term ratios, real-life examples and problems • A string is cut into three pieces whose lengths form a ratio of 3:5:7. If the string was 105 cm long, how long are the pieces? • creating a cedar drum box of proportions that use ratios to create differences in pitch and tone • paddle making	**Number Unit 2: Proportions, Ratios, Rates, and Percents** 7: Exploring Ratios 8: Relating Ratio and Proportion 9: Exploring Rates 10: Solving Problems Involving Ratios, Rate, and Proportions	**Big Idea: Numbers are related in many ways.** **Using ratios, rates, proportions, and percents creates a relationship between quantities** - Solves for missing values and determines equivalent ratios and rates using flexible strategies (e.g., tables, graphing, unit rates, $\frac{a}{b} = \frac{c}{d}$ relationship). - Demonstrates multiplicative reasoning by applying unit rates in whole number contexts (e.g., If she earns $12 per hour, how much will she earn for 5 h of work?) - Understands and applies the concept of unit rates (e.g., If 3 kg is $5, how much is 1 kg or how many kg for $1?). **BIG IDEA:** Regularity and repetition form patterns that can be generalized and predicted mathematically. **Generalizing and analyzing patterns, relations, and functions** - Analyzes the relationship between values of two linear number patterns (e.g., P1 is 2, 4, 6, 8, …; and P2 is 3, 6, 9, 12, …; as P1 goes up by 1, P2 goes up by 3).

Operations with fractions (addition, subtraction, multiplication, division, and order operations): • includes the use of brackets, but excludes exponents • using pattern blocks or Cuisenaire Rods • simplifying ½ ÷ 9/6 x (7 – 4/5) • drumming and song: 1/2, 1/4, 1/8, whole notes, dot bars, rests = one beat • changing tempos of traditional songs dependent on context of use • proportional sharing of harvests based on family size	**Number Unit 3: Operations with Fractions and Mixed Numbers** 14. Adding Fractions and Mixed Numbers 15. Subtracting Fractions and Mixed Numbers 16. Multiplying Fractions and Mixed Numbers 17. Dividing Fractions and Mixed Numbers 18. Applying the Order of Operations with Fractions and Mixed Numbers	**Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Developing Conceptual Meaning of Operations** - Models and demonstrates an understanding of fraction addition and subtraction. - Models and demonstrates an understanding of multiplication and division of fractions. **Developing Fluency of Operations** - Solves fraction addition and subtraction using efficient strategies.
Discrete linear relations (extended to larger numbers, limited to integers): • two-variable discrete linear relations • expressions, table of values, and graphs • scale values (e.g., tick marks on axis represent 5 units instead of 1) • four quadrants, integral coordinates	**Patterning Unit 1: Linear Relations and Equations** 2: Representing Linear Relations 3: Determining if a Relationship is Linear	**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. - Generates ordered pairs for a linear relation and plots the coordinates on a graph. (Limited to integer values on four quadrants.) - Matches different representations of the same linear relation (e.g., graph, equation, table of values). - Differentiates between linear and non-linear relations by their graphical representation.

Expressions – writing and evaluating using substitution: • using an expression to describe a relationship • evaluating 0.5n – 3n + 25, if n = 14	**Patterning Unit 1: Linear Relations and Equations** 1: Writing and Evaluating Algebraic 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** - Evaluates algebraic expressions, including formulas, given specific values for the variables (e.g., evaluate $3r – 12$, when $r = 3$; $\frac{1}{2}(bh)$, when base is 12 cm and height is 5 cm). - Write expressions to describe patterns and contexts representing linear relations (e.g., 5, 8, 11, 14 can be represented as $3n + 2$).
Two-step equations with integer coefficients, constants, and solutions: • solving and verifying 3x – 4 = –12 • modelling the preservation of equality (e.g., using a balance, manipulatives, algebra tiles, diagrams) • spirit canoe journey calculations	**Patterning Unit 1: Linear Relations and Equations** 4: Solving Linear Equations Using Models 5: Solving Linear Equations Algebraically 6: Solving Linear Equations Using the Distributive Property 7: Solving Problems Using Linear Equations	**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.** - Investigates and models the meaning of preservation of equality of single variable equations (e.g., $3x = 12$). - Models the preservation of equality to solve equations involving integer coefficients (e.g., $–4m + 16 = –12$). - Applies arithmetic properties to transform, simplify, and identify equivalent linear expressions (e.g., $x(4 + 5) = 4x + 5x = 9x$). - Applies the distributive property to expressions and identifies common factors to create equivalent expressions (e.g., $4a + 12 = 4(a + 3)$). **Using variables, algebraic expressions, and equations to represent mathematical relations** - Evaluates algebraic expressions, including formulas, given specific values for the variables (e.g., evaluate $3r – 12$, when $r = 3$; $\frac{1}{2}(bh)$, when base is 12 cm and height is 5 cm).

		- Write expressions to describe patterns and contexts representing linear relations (e.g., 5, 8, 11, 14 can be represented as 3*n* + 2).
Surface area and volume of regular solids, including triangular and other right prisms and cylinders: • exploring strategies to determine the surface area and volume of a regular solid using objects, a net, 3-D design software • volume = area of the base x height • surface area = sum of the areas of each side	**Measurement Unit 1: 2-D Shapes and 3-D Solids** 3: Exploring Nets of Prisms and Cylinders 4: Determining the Surface Area of Prisms and Cylinders 5: Determining the Volume of Prisms and Cylinders	**Big Idea: 2-D Shapes and 3-D solids can be analyzed and classified in different ways by their attributes.** **Investigating 2-D shapes, 3-D solids, and their attributes through composition and decomposition** - Identifies and constructs nets for 3-D objects made from polygons (e.g. cylinder, hexagonal prism) **Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons.** **Understanding relationships among measured units** - Develops and generalizes strategies and formulas to compute volume and surface area of regular solids (e.g., cones, cylinders, and spheres).
Pythagorean theorem: • modelling the Pythagorean theorem • finding a missing side of a right triangle • deriving the Pythagorean theorem constructing canoe paths and landings given current on a river • First Peoples constellations	**Measurement Unit 1: 2-D Shapes and 3-D Solids** 1: Exploring the Pythagorean Theorem 2: Applying the Pythagorean Theorem to Solve Problems	**Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons.** **Selecting and using units to estimate, measure, construct, and make comparisons** - Applies Pythagorean Theorem to find unknown side lengths and distance between points on a Cartesian plane. **Understanding relationships among measured units** - Develops and generalizes strategies to construct, compute, and apply the Pythagorean Theorem.

Construction, views, and nets of 3-D objects: • top, front, and side views of 3D objects • matching a given net to the 3D object it represents • drawing and interpreting top, front, and side views of 3D objects • constructing 3D objects with nets • using design software to create 3D objects from nets • bentwood boxes, lidded baskets, packs	**Measurement Unit 1: 2-D Shapes and 3-D Solids** 3: Exploring Nets of Prisms and Cylinders 6: Sketching Views of 3-D Objects 7: Building 3-D Objects from their Views	**Big Idea: 2-D Shapes and 3-D solids can be analyzed and classified in different ways by their attributes.** **Investigating 2-D shapes, 3-D solids, and their attributes through composition and decomposition** - Identifies and constructs nets for 3-D objects made from polygons (e.g. cylinder, hexagonal prism) **Big Idea: Objects can be located in space and viewed from multiple perspectives.** **Viewing and representing objects from multiple perspectives** - Designs and represents compound 3-D objects using 2-D representations from multiple perspectives (e.g., isometric sketches, orthographic sketches, nets). - Interprets and creates coded plans, and constructs objects from plans (e.g., uses linking cubes to build 3-D object from plan).
Central tendency: • mean, median, and mode	**Data Management Unit 1: Data Management** 1: Determining Mean and Mode 2: Determining Median and Range 3: Comparing Measures of Central Tendency	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphic displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness.** **Reading and Interpreting Data Displays and Analyzing Variability.** - Determines range values (e.g., maximum, minimum, difference) and relates values to the variability of data collected. - Visualizes and determines the median value as a middle measure representing a whole data set. - Visualizes and determines the mean of a data set. - Understands and describes the differences between the central tendency values (i.e., mode, median, mean) and explores which measure is most appropriate for the data collected. **Using the language and tools of chance to describe and predict events.** - Describes data using frequency counts (e.g., 5 people chose peppermint) and modal value (e.g., dogs are the most common pet).

Theoretical probability: **with two independent events** • with two independent events: sample space (e.g., using tree diagram, table, graphic organizer) • rolling a 5 on a fair die and flipping a head on a fair coin is 1/6 x ½ = 1/12 • deciding whether a spinner in a game is fair	**Data Management Unit 2: Probability** 6: Determining the Probability of Events 7: Comparing Theoretical and Experimental Probability of Two Independent Events	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphic displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness.** **Using the language and tools of chance to describe and predict events.** - Generalizes the multiplication rule of probability for independent events (e.g., probability of tossing two heads is $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$).
Financial literacy – best buys • coupons, proportions, unit price, products and services • proportional reasoning strategies (e.g., unit rate, equivalent fractions given prices and quantities)	**Number Unit 4: Financial Literacy** 20: Solving Problems Involving Coupons and Discounts 21: Calculating The Best Buy	**Big Idea: Numbers are related in many ways.** **Using ratios, rates, proportions, and percents creates a relationship between quantities** - Understands and applies the concept of percentage as a rate per 100 (e.g., calculating sales tax, tips, or discount) - Understands and applies the concept of unit rates (e.g., If 3 kg is $5, how much is 1 kg or how many kg for $1?).