



Correlation of the Manitoba Mathematics Curriculum Framework of Outcomes with Mathology Grade 8 (Number)

Curriculum Outcomes	Grade 8 Mathology.ca	Mathology Practice Workbook 8	Pearson Canada Grades 4–9 Mathematics Learning Progression
General Learning Outcome Develop number sense.			
Specific Learning Outcomes 8.N.1 Demonstrate an understanding of perfect squares and square roots, concretely, pictorially and symbolically (limited to whole numbers).	Number Unit 1: Fluency with Whole Numbers and Integers 1: Investigating Perfect Squares and Square Roots	Unit 2 Questions 1, 2, 3, 5, 8 (pp. 10-12)	Big Idea: Numbers are related in many ways. Decomposing and composing numbers to investigate equivalencies - Models and expresses the inverse relationship between perfect squares and 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.
8.N.2 Determine the approximate square root of numbers that are not perfect squares (limited to whole numbers).	Number Unit 1: Fluency with Whole Numbers and Integers 1: Investigating Perfect Squares and Square Roots	Unit 2 Questions 4-7 (pp. 11-12)	Big Idea: Numbers are related in many ways. Decomposing and composing numbers to investigate equivalencies - Models and expresses the inverse relationship between perfect squares and 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.

<p>8.N.3 Demonstrate an understanding of percents greater than or equal to 0%.</p>	<p>Number Unit 2: Proportions, Ratios, Rates, and Percent 11: Working with Whole Number Percents 12: Working with Fractional Percents 13: Solving Percent Problems</p> <p>Number Unit 4: Financial Literacy 20: Solving Problems Involving Coupons and Discounts</p>	<p>Unit 6 Questions 27-33 (pp. 62-64)</p> <p>Unit 10 Questions 3-7, 12 (pp. 98-100, 102)</p> <p>Unit 11 Question 21 (p. 114)</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"> - Understands and applies the concept of percentage as a rate per 100 (e.g., calculating sales tax, tips, or discount) - Understands the meaning of percents greater than 100% and less than 1%
<p>8.N.4 Demonstrate an understanding of ratio and rate.</p>	<p>Number Unit 2: Proportions, Ratios, Rates, and Percent 7: Exploring Ratios 8: Relating Ratio and Proportion 9: Exploring Rates</p>	<p>Unit 6 Questions 1, 2 (p. 52-53)</p> <p>Unit 10 Questions 11, 14 (pp. 101, 104)</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"> - 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?). <p>Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically. Generalizing and analyzing patterns, relations, and functions</p> <ul style="list-style-type: none"> - 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).

<p>8.N.5 Solve problems that involve rates, ratios and proportional reasoning.</p>	<p>Number Unit 2: Proportions, Ratios, Rates, and Percent 7: Exploring Ratios 8: Relating Ratio and Proportion 9: Exploring Rates 10: Solving Problems Involving Proportions, Ratios, and Rate</p> <p>Number Unit 4: Financial Literacy 21: Calculating the Best Buy</p>	<p>Unit 6 Question 3-8, 10-14, 16-26, 34 (pp. 53-62, 65)</p> <p>Unit 10 Questions 11, 14 (pp. 101, 104)</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"> - 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?). <p>Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically. Generalizing and analyzing patterns, relations, and functions</p> <ul style="list-style-type: none"> - 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).
<p>8.N.6 Demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially and symbolically.</p>	<p>Number Unit 3: Operations with Fractions and Mixed Numbers 16: Multiplying Fractions and Mixed Numbers 17: Dividing Fractions and Mixed Numbers</p>	<p>Unit 7 Questions 6-15, 18, 19 (pp. 68-73)</p>	<p>Big Idea: Quantities and numbers can be operated on to determine how many and how much. Developing Conceptual Meaning of Operations</p> <ul style="list-style-type: none"> - Models and demonstrates an understanding of multiplication and division of fractions.
<p>8.N.7 Demonstrate an understanding of multiplication and division of integers, concretely, pictorially and symbolically.</p>	<p>Number Unit 1: Fluency with Whole Numbers and Integers 4: Multiplying Integers 5: Dividing Integers 6: Order of Operations with Integers</p>	<p>Unit 11 Questions 10-19, 22, 25 (pp. 111-113, 115-116)</p>	<p>Big Idea: Quantities and numbers can be operated on to determine how many and how much. Developing conceptual meaning of operations</p> <ul style="list-style-type: none"> - Models and demonstrates an understanding of integer addition and subtraction. - Models and demonstrates an understanding of integer multiplication and division. <p>Developing fluency of operations</p> <ul style="list-style-type: none"> - Estimates and solves integer addition and subtraction using efficient strategies. - Solves integer multiplication and division using efficient strategies.

<p>8.N.8 Solve problems involving positive rational numbers.</p>	<p>Number Unit 3: Operations with Fractions and Mixed Numbers 19: Solving Problems with Positive Rational Numbers</p>	<p>Unit 10 Questions 10, 13-17 (pp. 70-72)</p>	<p>Big Idea: Quantities and numbers can be operated on to determine how many and how much. Developing fluency of operations</p> <ul style="list-style-type: none"> - Solves fraction addition and subtraction using efficient strategies <p>Developing conceptual meaning of operations</p> <ul style="list-style-type: none"> - Models and demonstrates an understanding of multiplication and division of fractions.
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**Correlation of the Manitoba Mathematics Curriculum Framework of Outcomes
with Mathology Grade 8 (Patterns and Relations: Patterns)**

Curriculum Outcomes	Grade 8 Mathology.ca	Mathology Practice Workbook 8	Pearson Canada Grades 4–9 Mathematics Learning Progression
General Learning Outcome Use patterns to describe the world and solve problems.			
Specific Learning Outcomes 8.PR.1 Graph and analyze two-variable linear relations.	Patterning Unit 1: Linear Relations and Equations 2: Representing Linear Relations 3: Determining if a Relationship is Linear	Unit 1 Questions 1-8, 10, 11, 12, 17 (pp. 2-9) Unit 6 Question 14, 15, 17 (pp. 57-59)	Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically. Representing patterns, relations, and functions <ul style="list-style-type: none"> - 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.



Correlation of the Manitoba Mathematics Curriculum Framework of Outcomes with Mathology Grade 8 (Patterns and Relations: Variables and Equations)

Curriculum Outcomes	Grade 8 Mathology.ca	Mathology Practice Workbook 8	Pearson Canada Grades 4–9 Mathematics Learning Progression
General Learning Outcome Represent algebraic expressions in multiple ways.			
<p>Specific Learning Outcomes 8.PR.2 Model and solve problems using linear equations of the form:</p> <ul style="list-style-type: none"> • $ax = b$ • $\frac{x}{a} = b$, $a \neq 0$ • $ax + b = c$ • $\frac{x}{a} + b = c$, $a \neq 0$ • $a(x + b) = c$ <p>concretely, pictorially, and symbolically, where a, b and c are integers.</p>	<p>Patterning Unit 1: Linear Relations and Equations 4: Solving Linear Equations Using Models 5: Solving Linear Equations Algebraically 6: Solving Equations Involving the Distributive Property 7: Solving Problems Using Linear Equations</p>	<p>Unit 11 Question 20 (p. 113) Unit 12 Questions 8-15 (pp. 119-123)</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"> - 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., $4a + 12 = 4(a + 3)$). <p>Using variables, algebraic expressions, and equations to represent mathematical relations.</p> <ul style="list-style-type: none"> - 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). - Writes expressions to describe patterns and contexts representing linear relations (e.g., 5, 8, 11, 14 can be represented as $3n + 2$).



Correlation of the Manitoba Mathematics Curriculum Framework of Outcomes with Mathology Grade 8 (Shape and Space: Measurement)

Curriculum Outcomes	Grade 8 Mathology.ca	Mathology Practice Workbook 8	Pearson Canada Grades 4–9 Mathematics Learning Progression
General Learning Outcome Use direct or indirect measurement to solve problems.			
Specific Learning Outcomes 8.SS.1 Develop and apply the Pythagorean theorem to solve problems.	Measurement Unit 1: 2-D Shapes and 3-D Solids 1: Exploring the Pythagorean Theorem 2: Applying the Pythagorean Theorem to Solve Problems	Unit 3 Questions 1-12 (pp. 21-25)	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 <ul style="list-style-type: none"> - Applies Pythagorean Theorem to find unknown side lengths and distance between points on a Cartesian plane. Understanding relationships among measured units <ul style="list-style-type: none"> - Develops and generalizes strategies to construct, compute, and apply the Pythagorean Theorem.
8.SS.2 Draw and construct nets for 3-D objects.	Measurement Unit 1: 2-D Shapes and 3-D Solids 3: Exploring Nets of Prisms and Cylinders	Unit 4 Questions 6, 15 (pp. 35, 41)	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 <ul style="list-style-type: none"> - Identifies and constructs nets for 3-D objects made from polygons (e.g. cylinder, hexagonal prism)
8.SS.3 Determine the surface area of: <ul style="list-style-type: none"> • right rectangular prisms • right triangular prisms • right cylinders to solve problems.	Measurement Unit 1: 2-D Shapes and 3-D Solids 4: Determining the Surface Area of Prisms and Cylinders	Unit 4 Questions 7, 8, 10, 12 (pp. 36-38)	Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons. Understanding relationships among measured units <ul style="list-style-type: none"> - Develops and generalizes strategies and formulas to compute volume and surface area of regular solids (e.g., cones, cylinders, and spheres).

<p>8.SS.4 Develop and apply formulas for determining the volume of right rectangular prisms, right triangular prisms and right cylinders.</p>	<p>Measurement Unit 1: 2-D Shapes and 3-D Solids 5: Determining the Volume of Prisms and Cylinders</p>	<p>Unit 4 Questions 9, 10, 11, 15 (pp. 36-41)</p>	<p>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).</p>
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Correlation of the Manitoba Mathematics Curriculum Framework of Outcomes with Mathology Grade 8 (Shape and Space: 3-D Objects and 2-D Shapes)

Curriculum Outcomes	Grade 8 Mathology.ca	Mathology Practice Workbook 8	Pearson Canada Grades 4–9 Mathematics Learning Progression
General Learning Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.			
Specific Learning Outcomes 8.SS.5 Draw and interpret top, front, and side views of 3-D objects composed of right rectangular prisms.	Measurement Unit 1: 2-D Shapes and 3-D Solids 6: Sketching Views of 3-D Objects 7: Building 3-D Objects from their Views 8: Exploring Rotations of 3-D Objects	Unit 4 Questions 1-5 (pp. 32-35)	Big Idea: Objects can be located in space and viewed from multiple perspectives. Viewing and representing objects from multiple perspectives <ul style="list-style-type: none"> - 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).



**Correlation of the Manitoba Mathematics Curriculum Framework of Outcomes
with Mathology Grade 8 (Shape and Space: Transformations)**

Curriculum Outcomes	Grade 8 Mathology.ca	Mathology Practice Workbook 8	Pearson Canada Grades 4–9 Mathematics Learning Progression
General Learning Outcome Describe and analyze position and motion of objects and shapes.			
Specific Learning Outcomes 8.SS.6 Demonstrate an understanding of tessellation by <ul style="list-style-type: none"> explaining the properties of shapes that make tessellating possible creating tessellations identifying tessellations in the environment 	Geometry Unit 1: Tessellations 1: Exploring Tessellations 2: Using Transformations to Describe Tessellations	Unit 5 Questions 9-16 (pp. 46-49)	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 - Uses properties of shapes and transformations to design tessellations.



**Correlation of the Manitoba Mathematics Curriculum Framework of Outcomes
with Mathology Grade 8 (Statistics and Probability: Data Analysis)**

Curriculum Outcomes	Grade 8 Mathology.ca	Mathology Practice Workbook 8	Pearson Canada Grades 4–9 Mathematics Learning Progression
General Learning Outcome Collect, display, and analyze data to solve problems.			
Specific Learning Outcomes 8.SP.1 Critique ways in which data are presented.	Data Management Unit 1: Data Management 4: Presenting Data Graphically 5: Analyzing and Critiquing Given Data	Unit 9 Questions 7, 8, 9, 13, 14, 16, 17 (pp. 89-90, 93-96)	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. Creating graphical displays of collected data <ul style="list-style-type: none"> - Chooses and justifies appropriate visual representations for displaying discrete (e.g., bar graphs) and continuous (e.g., line graph) data. Reading and interpreting data displays and analyzing variability <ul style="list-style-type: none"> - Critiques the ways in which data are presented in graphs and tables (e.g., misleading graphs, changing scale).



Correlation of the Manitoba Mathematics Curriculum Framework of Outcomes with Mathology Grade 8 (Statistics and Probability: Chance and Uncertainty)

Curriculum Outcomes	Grade 8 Mathology.ca	Mathology Practice Workbook 8	Pearson Canada Grades 4–9 Mathematics Learning Progression
General Learning Outcome Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.			
Specific Learning Outcomes 8.SP.2 Solve problems involving the probability of independent events.	Data Management Unit 2: Probability 6: Determining the Probability of Events 7: Comparing Theoretical and Experimental Probability of Two Independent Events 8: Determining the Probability of Three Independent Events	Unit 8 Questions 1-17 (pp. 76-84)	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 $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$).

Mathology 8 Practice Workbook Unit 10: Financial Literacy
Mathology 8 Practice Workbook Unit 13: Coding

Not required, but recommended
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