

Correlation of Manitoba Program of Studies with Mathology Grade 6 (Number)

Curriculum Expectations	Grade 6 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Learning Outcome: Develop number sense.		
Specific Learning Outcomes 6.N.1. Demonstrate an understanding of place value for numbers <ul style="list-style-type: none"> • greater than one million • less than one-thousandth 	Number Unit 1: Number Relationships and Place Value 1: Representing Larger Numbers (to 1 000 000 and Beyond) 2: Representing Numbers in Different Forms 5: Consolidation of Number Relationships and Place Value Number Unit 3: Fractions, Decimals, Percents, and Integers 15: Representing Decimals 16: Comparing and Ordering Decimals 21: Consolidation of Fractions, Decimals, Percents and Integers	Big Idea: The set of real numbers is infinite. Extending whole number understanding to the set of real numbers - Extends whole number understanding to 1 000 000. - Extends decimal number understanding to thousandths. Big Idea: Numbers are related in many ways. Comparing and ordering quantities (multitude or magnitude) - Compares, orders, and locates whole numbers based on place-value understanding, and records using $<$, $=$, and $>$ symbols. - Compares, orders, and locates decimal numbers using place-value understanding. Decomposing and composing numbers to investigate equivalencies - Composes and decomposes whole numbers using standard and non-standard partitioning (e.g., 1000 is 10 hundreds or 100 tens). - Composes and decomposes decimal numbers using standard and non-standard partitioning (e.g., 1.6 is 16 tenths or 0.16 tens). Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units. Unitizing quantities into base-ten units - Writes and reads whole numbers in multiple forms (e.g., 1358; one thousand three hundred fifty-eight; $1000 + 300 + 50 + 8$). - Understands that the value of a digit is ten times the value of the same digit one

		<p>place to the right.</p> <ul style="list-style-type: none"> - Understands that the value of a digit is one-tenth the value of the same digit one place to the left. - Writes and reads decimal numbers in multiple forms (e.g., numerals, number names, expanded form).
6.N.2. Solve problems involving large numbers, using technology.	<p>Number Unit 2: Fluency with Whole Numbers</p> <p>6: Solving Problems with Whole Numbers</p> <p>7: Estimating Reasonableness of Solutions</p> <p>9: Mental Math Strategies</p> <p>12: Consolidation of Fluency with Whole Numbers</p>	<p>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</p> <p>Developing conceptual meaning of operations</p> <ul style="list-style-type: none"> - Extends whole number computation models to larger numbers <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).
<p>6.N.3. Demonstrate an understanding of factors and multiples by</p> <ul style="list-style-type: none"> • determining multiples and factors of numbers less than 100 • identifying prime and composite numbers • solving problems involving factors or multiples 	<p>Number Unit 1: Number Relationships and Place Value</p> <p>3: Identifying Factors and Multiples</p> <p>4: Identifying Prime and Composite Numbers</p> <p>5: Consolidation of Number Relationships and Place Value</p>	<p>Big Idea: Numbers are related in many ways.</p> <p>Decomposing and composing numbers to investigate equivalencies</p> <ul style="list-style-type: none"> - Decomposes numbers into prime factors. <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"> - Determines whether one number is a multiple of any one-digit number. - Examines and classifies whole numbers based on their properties (e.g., even/odd; prime; composite; divisible by 2, 5, and 10). - Generates multiples and factors for numbers using flexible strategies. - Distinguishes between and investigates properties of prime and composite numbers (e.g., prime factorization). <p>Developing fluency of operations</p> <ul style="list-style-type: none"> - Fluently recalls multiplication and division facts to 100.
6.N.4. Relate improper fractions to mixed numbers.	<p>Number Unit 3: Fractions, Decimals, Percents, and Integers</p> <p>13: Representing Fractions</p> <p>14: Comparing and Ordering Fractions</p>	<p>Big Idea: Numbers are related in many ways.</p> <p>Comparing and ordering quantities (multitude or magnitude)</p> <ul style="list-style-type: none"> - Compares, orders, and locates fractions using flexible strategies (e.g., comparing models; creating common denominators

	21: Consolidation of Fractions, Decimals, Percents and Integers	or numerators). Estimating quantities and numbers - Estimates the size and magnitude of fractions by comparing to benchmarks. Decomposing and composing numbers to investigate equivalencies - Models equivalent forms of improper fractions and mixed numbers using flexible strategies.
6.N.5. Demonstrate an understanding of ratio, concretely, pictorially, and symbolically.	Number Unit 2: Fluency with Whole Numbers 11: Exploring Ratios 12: Consolidation of Fluency with Whole Numbers	Big Idea: Numbers are related in many ways. Using ratios, rates, proportions, and percents creates a relationship between quantities - Understands the concept of ratio as a relationship between two quantities (e.g., 3 wins to 2 losses).
6.N.6. Demonstrate an understanding of percent (limited to whole numbers), concretely, pictorially, and symbolically.	Number Unit 3: Fractions, Decimals, Percents, and Integers 18: Relating Fractions, Decimals, and Percents 21: Consolidation of Fractions, Decimals, Percents and Integers	Big Idea: Numbers are related in many ways. Decomposing and composing numbers to investigate equivalencies - Models and explains the relationships among fractions, decimals, and percents. - Translates flexibly between representations.
6.N.7. Demonstrate an understanding of integers, concretely, pictorially, and symbolically.	Number Unit 3: Fractions, Decimals, Percents, and Integers 19: Representing Integers 20: Comparing and Ordering Integers 21: Consolidation of Fractions, Decimals, Percents and Integers	Big Idea: The set of real numbers is infinite Extending whole number understanding to the set of real numbers - Extends whole number understanding to negative numbers.
6.N.8. Demonstrate an understanding of multiplication and division of decimals (involving 1-digit whole-number multipliers, 1-digit natural number divisors, and multipliers and divisors that are multiples of 10), concretely, pictorially, and symbolically, by <ul style="list-style-type: none"> • using personal strategies • using the standard algorithms • using estimation • solving problems 	Number Unit 4: Operations with Fractions and Decimals 22: Multiplying Decimals by 1-Digit Numbers 24: Dividing Decimals by 1-Digit Numbers 30: Consolidation of Operations with Fractions and Decimals	Big Idea: Quantities and numbers can be operated on to determine how many and how much. Developing conceptual meaning of operations - Demonstrates an understanding of decimal number computation through modelling and flexible strategies. Developing fluency of operations - Solves decimal number computation using efficient strategies.

<p>6.N.9. Explain and apply the order of operations, excluding exponents (limited to whole numbers).</p>	<p>Number Unit 2: Fluency with Whole Numbers 8: The Order of Operations 12: Consolidation of Fluency with Whole Numbers</p>	<p>Big Idea: Quantities and numbers can be operated on to determine how many and how much. Investigating number and arithmetic properties - Applies order of operations for whole numbers and explains the effect when order is not followed.</p>
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Correlation of Manitoba Program of Studies with Mathology Grade 6 (Patterns and Relations: Patterns)

Curriculum Expectations	Grade 6 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Learning Outcome: Use patterns to describe the world and solve problems.		
Specific Learning Outcomes 6.PR.1. Demonstrate an understanding of the relationships within tables of values to solve problems.	Patterning Unit 1: Patterning 1: Investigating Patterns and Relationships in Tables and Graphs 2: Solving Problems 4: Consolidation of Patterning	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 numeric or shape pattern using a table of values by pairing the term value with a term number. - Represents a mathematical context or problem with expressions and equations using variables to represent unknowns. Generalizing and analyzing patterns, relations, and functions <ul style="list-style-type: none"> - Explains the rule for numeric patterns including the starting point and change (e.g., given: 16, 22, 28, 34, Start at 16 and add 6 each time). - Describes numeric and shape patterns using words and numbers. - Predicts the value of a given element in a numeric or shape pattern using pattern rules. - Describes the relationship between two numeric patterns (e.g., for every 4 steps, she travels 3 metres).
6.PR.2 Represent and describe patterns and relationships using graphs and tables.	Patterning Unit 1: Patterning 1: Investigating Patterns and Relationships in Tables and Graphs 2: Solving Problems 4: Consolidation of Patterning	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 numeric or shape pattern using a table of values by pairing the term value with a term number. - Represents a mathematical context or problem with expressions and equations using variables to represent unknowns. Generalizing and analyzing patterns, relations, and functions

		<ul style="list-style-type: none">- Explains the rule for numeric patterns including the starting point and change (e.g., given: 16, 22, 28, 34, Start at 16 and add 6 each time).- Describes numeric and shape patterns using words and numbers.- Predicts the value of a given element in a numeric or shape pattern using pattern rules.- Describes the relationship between two numeric patterns (e.g., for every 4 steps, she travels 3 metres).
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Correlation of Manitoba Program of Studies with Mathology Grade 6 (Patterns and Relations: Variables and Equations)

Curriculum Expectations	Grade 6 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Learning Outcome: Represent algebraic expressions in multiple ways.		
<p>Specific Learning Outcomes 6.PR.3. Represent generalizations arising from number relationships using equations with letter variables.</p>	<p>Patterning Unit 2: Variables and Equations 6: Investigating Equality in Equations 7: Representing Generalizations in Patterns 10: Consolidation of Variables and Equations</p> <p>Measurement Unit 1A: Perimeter, Area, Volume, and Capacity 1: Determining the Perimeter of Polygons 2: Determining the Area of Rectangles</p>	<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"> - Understands an unknown quantity (i.e., variable) may be represented by a symbol or letter (e.g., $13 - \square = 8$; $4n = 12$). - Flexibly uses symbols and letters to represent unknown quantities in equations (e.g., knows that $4 + \square = 7$; $4 + x = 7$; and $4 + y = 7$ all represent the same equation with \square, x, and y representing the same value). - Interprets and writes algebraic expressions (e.g., $2n$ means two times a number; subtracting a number from 7 can be written as $7 - n$). - Understands a variable as a changing quantity (e.g., $5s$, where s can be any value). - Uses expressions and equations with variables to represent generalized relations and algorithms (e.g., $P = 2l + 2w$). <p>Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons. Understanding relationships among measured units</p> <ul style="list-style-type: none"> - Develops and generalizes strategies to compute area and perimeter of rectangles.

<p>6.PR.4. Demonstrate and explain the meaning of preservation of equality, concretely, pictorially, and symbolically.</p>	<p>Patterning Unit 2: Variables and Equations 6: Investigating Equality in Equations 10: Consolidation of Variables and Equations</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"> - Recognizes that an equal sign between two expressions with variables indicates that the expressions are equivalent (e.g., $5n - 4 = 3n$; $3r = 2 + s$). - Investigates and models the meaning of preservation of equality of single variable equations (e.g., $3x = 12$).
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Correlation of Manitoba Program of Studies with Mathology Grade 6 (Shape and Space: Measurement)

Curriculum Expectations	Grade 6 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Learning Outcome: Use direct or indirect measurement to solve problems.		
Specific Learning Outcomes 6.SS.1. Demonstrate an understanding of angles by <ul style="list-style-type: none"> • identifying examples of angles in the environment • classifying angles according to their measure • estimating the measure of angles using 45°, 90°, and 180° as reference angles • determining angle measures in degrees • drawing and labelling angles when the measure is specified 	Geometry Unit 1A: 2-D Shapes and Angles 1: Classifying and Measuring Angles 2: Measuring and Constructing Angles 6: Consolidation of 2-D Shapes and Angles	Big Idea: Many things in our world (e.g., objects, spaces, events) have attributes that can be measured and compared. Understanding attributes that can be measured, compared, and ordered - Understands angle as an attribute that can be measured and compared. - Understands angle is additive (e.g., 90° can be visualized as nine sectors that are 10° each). 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 - Measures, constructs, and estimates angles using degrees. 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 - Draws, compares, and classifies angles (i.e., right, acute, obtuse, straight, reflex).
6.SS.2. Demonstrate that the sum of interior angles is <ul style="list-style-type: none"> • 180° in a triangle • 360° in a quadrilateral 	Geometry Unit 1A: 2-D Shapes and Angles 3: Classifying Triangles 4: Identifying and Constructing Triangles 6: Consolidation of 2-D Shapes and Angles	Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons. Understanding relationships among measured units - Investigates and generalizes sum of interior angles of triangles (i.e., sum of angles of a triangle is 180°).

<p>6.SS.3. Develop and apply a formula for determining the</p> <ul style="list-style-type: none"> • perimeter of polygons • area of rectangles • volume of right rectangular prisms 	<p>Measurement Unit 1A: Perimeter, Area, Volume, and Capacity</p> <p>1: Determining the Perimeter of Polygons</p> <p>2: Determining the Area of Rectangles</p> <p>4: Determining the Volume of Right Rectangular Prisms</p> <p>6: Consolidation of Perimeter, Area, Volume, and Capacity</p>	<p>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</p> <p>- Measures, constructs, and estimates perimeter and area of regular and irregular polygons.</p> <p>Understanding relationships among measured units</p> <p>- Develops and generalizes strategies to compute area and perimeter of rectangles.</p> <p>- Develops and generalizes strategies and formulas to compute volumes of right rectangular prisms.</p>
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Correlation of Manitoba Program of Studies with Mathology Grade 6 (Shape and Space: 3-D Objects and 2-D Shapes)

Curriculum Expectations	Grade 6 Mathology.ca	Pearson Canada Grades 4-6 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 6.SS.4. Construct and compare triangles, including <ul style="list-style-type: none"> • scalene • isosceles • equilateral • right • obtuse • acute in different orientations.	Geometry Unit 1A: 2-D Shapes and Angles 3: Classifying Triangles 4: Identifying and Constructing Triangles 6: Consolidation of 2-D Shapes and Angles	Big Ideas: 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 - Sorts, describes, constructs, and classifies polygons based on side attributes (e.g., parallel, perpendicular, regular/irregular). - Sorts, describes, and classifies 2-D shapes based on their geometric properties (e.g., side length, angles, diagonals). - Classifies 2-D shapes within a hierarchy based on their properties (e.g., rectangles are a subset of parallelograms).
6.SS.5. Describe and compare the sides and angles of regular and irregular polygons.	Geometry Unit 1A: 2-D Shapes and Angles 5: Investigating Polygons 6: Consolidation of 2-D Shapes and Angles	Big Ideas: 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 - Sorts, describes, constructs, and classifies polygons based on side attributes (e.g., parallel, perpendicular, regular/irregular). - Sorts, describes, and classifies 2-D shapes based on their geometric properties (e.g., side lengths, angles, diagonals).

Correlation of Manitoba Program of Studies with Mathology Grade 6 (Shape and Space: Transformations)

Curriculum Expectations	Grade 6 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Learning Outcome: Describe and analyze position and motion of objects and shapes.		
Specific Learning Outcomes 6.SS.6. Perform a combination of transformations (translations, rotations, or reflections) on a single 2-D shape, and draw and describe the image.	Geometry Unit 2A: Transformations 7: Rotating 2-D Shapes on a Grid 8: Single Transformations on a Grid 9: Combining Transformations on a Grid 12: Consolidation of Transformations	Big Ideas: 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 - Identifies, describes, and performs single transformations (i.e., translation, reflection, rotation) on 2-D shapes. - Identifies, describes, applies, and creates a combination of successive transformations on 2-D shapes.
6.SS.7. Perform a combination of successive transformations of 2-D shapes to create a design, and identify and describe the transformations.	Geometry Unit 2A: Transformations 9: Combining Transformations on a Grid 12: Consolidation of Transformations	Big Ideas: 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 - Identifies, describes, and performs single transformations (i.e., translation, reflection, rotation) on 2-D shapes. - Identifies, describes, applies, and creates a combination of successive transformations on 2-D shapes.
6.SS.8. Identify and plot points in the first quadrant of a Cartesian plane using whole-number ordered pairs.	Geometry Unit 2A: Transformations 10: Plotting and Reading Coordinates 11: Transformations on a Coordinate Plane 12: Consolidation of Transformations	Big Idea: Objects can be located in space and viewed from multiple perspectives. Locating and mapping objects in space - Develops understanding of a Cartesian plane as a coordinate system using perpendicular axes. - Plots and locates points on a Cartesian plane, and relates the location to the two axes. (Limited to the first quadrant.)

<p>6.SS.9. Perform and describe single transformations of a 2-D shape in the first quadrant of a Cartesian plane (limited to whole-number vertices).</p>	<p>Geometry Unit 2A: Transformations 11: Transformations on a Coordinate Plane 12: Consolidation of Transformations</p>	<p>Big Idea: Objects can be located in space and viewed from multiple perspectives. Locating and mapping objects in space - Plots and locates points on a Cartesian plane, and relates the location to the two axes. (Limited to the first quadrant.) - Analyzes and locates the vertices of 2-D shapes after transformation on a Cartesian plane. (Limited to the first quadrant.)</p>
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Correlation of Manitoba Program of Studies with Mathology Grade 6 (Statistics and Probability: Data Analysis)

Curriculum Expectations	Grade 6 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Learning Outcome: Collect, display, and analyze data to solve problems.		
Specific Learning Outcomes 6.SP.1. Create, label, and interpret line graphs to draw conclusions.	Data Management Unit 1: Data Management 1: Exploring Line Graphs 6: Consolidation of Data Management	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 - Differentiates between discrete (e.g., votes) and continuous (e.g., height) data. Creating graphical displays of collected data - Represents data graphically using many-to-one correspondence with appropriate scales and intervals (e.g., each symbol on pictograph represents 10 people). - Chooses and justifies appropriate visual representations for displaying discrete (e.g., bar graph) and continuous (e.g., line graph) data.
6.SP.2. Select, justify, and use appropriate methods of collecting data, including <ul style="list-style-type: none"> • questionnaires • experiments • databases • electronic media 	Data Management Unit 1: Data Management 3: Collecting and Organizing Data 6: Consolidation of Data Management	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 - Constructs data organizers to support data collection (e.g., creates tally chart or line plot on a grid to collect survey data). - Selects and justifies an appropriate method of data collection (e.g., experiment, observation, survey) based on question posed.

<p>6.SP.3. Graph collected data and analyze the graph to solve problems.</p>	<p>Data Management Unit 1: Data Management 3: Collecting and Organizing Data 4: Interpreting Graphs to Solve Problems 6: Consolidation of Data Management</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. Creating graphical displays of collected data - Represents data graphically using many-to-one correspondence with appropriate scales and intervals (e.g., each symbol on pictograph represents 10 people). - Chooses and justifies appropriate visual representations for displaying discrete (e.g., bar graph) and continuous (e.g., line graph) data. Reading and interpreting data displays and analyzing variability - Reads and interprets data displays using many-to-one correspondence. Drawing conclusions by making inferences and justifying decisions based on data collected - Draws conclusions on data presented. - Interprets the results of data presented graphically from primary (e.g., class survey) and secondary (e.g., online news report) sources.</p>
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Correlation of Manitoba Program of Studies with Mathology Grade 6 (Statistics and Probability: Chance and Uncertainty)

Curriculum Expectations	Grade 6 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Learning Outcome: Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.		
Specific Learning Outcomes 6.SP.4. Demonstrate an understanding of probability by <ul style="list-style-type: none"> • identifying all possible outcomes of a probability experiment • differentiating between experimental and theoretical probability • determining the theoretical probability of outcomes in a probability experiment • determining the experimental probability of outcomes in a probability experiment • comparing experimental results with the theoretical probability for an experiment 	Data Management Unit 2: Probability 7: Exploring Theoretical Probability 8: Identifying Possible Outcomes 9: Conducting Experiments 10: Consolidation of Probability	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 - Records the results of multiple trials of simple events. Using the language and tools of chance to describe and predict events - Locates the likelihood of outcomes on a vocabulary-based probability continuum (e.g., impossible, unlikely, likely, certain). - Distinguishes between equally likely events (e.g., heads or tails on a fair coin) and unequally likely events (e.g., spinner with differently sized sections). - Identifies the sample space of independent events in an experiment (e.g., flipping a cup, drawing a coloured cube from a bag). - Investigates and calculates the experimental probability (i.e., relative frequency) of simple events (e.g., 3 heads in 5 coins tosses is $\frac{3}{5}$).