**Correlation of Manitoba Program of Studies with Mathology Grade 4 (Number)**

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| **Curriculum Expectations** | **Grade 4 Mathology.ca** | **Pearson Canada Grades 4-6 Mathematics Learning Progression** |
| **General Learning Outcome:**Develop number sense. |
| **Specific Learning Outcomes**4.N.1. Represent and describe whole numbers to 10 000, pictorially and symbolically. | **Number Unit 1: Number Relationships and Place Value**1: Representing Numbers to 10 0002: Composing and Decomposing Larger Numbers6: Consolidation of Number Relationships and Place Value | **Big Idea: Numbers are related in many ways.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).**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 place to the right. |
| 4.N.2. Compare and order numbers to 10 000. | **Number Unit 1: Number Relationships and Place Value**4: Comparing and Ordering Numbers6: Consolidation of Number Relationships and Place Value | **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 <, =, > symbols. |
| 4.N.3. Demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3- and 4-digit numerals), concretely, pictorially, and symbolically, by* using personal strategies
* using the standard algorithms
* estimating sums and differences
* solving problems
 | **Number Unit 2: Fluency with Addition and Subtraction**7: Estimating Sums and Differences8: Modelling Addition and Subtraction9: Adding and Subtracting Larger Numbers10: Using Mental Math to Add and Subtract11: Creating and Solving Problems12: Consolidation of Fluency with Addition and Subtraction | **Big Idea: Quantities and numbers can be operated on to determine how many and how much.****Investigating number and arithmetic properties**- Recognizes and generates equivalent numerical expressions using commutative and associative properties.- Understands operation relationships (e.g., inverse relationship between multiplication/division, addition/subtraction).- Understands the identity of operations (e.g., 5 + 0 = 5; 7 × 1 = 7).**Developing conceptual meaning of operations**- Models and develops meaning for whole number computation to four digits.**Developing fluency of operations**- Estimates the result of whole number operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?).- 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). |
| 4.N.4. Apply the properties of 0 and 1 for multiplication and the property of 1 for division. | **Number Unit 5: Fluency with Multiplication and Division Facts**24: Strategies for Multiplication27: Strategies for Division29: Consolidation of Fluency with Multiplication and Division Facts | **Big Idea: Quantities and numbers can be operated on to determine how many and how much.****Investigating number and arithmetic properties**- Understands the identity of operations (e.g., 5 + 0 = 5; 7 × 1 = 7). |
| 4.N.5.Describe and apply mental mathematics strategies, such as* skip-counting from a known fact
* using halving/doubling
* using doubling and adding one more group
* using patterns in the 9s facts
* using repeated doubling

to develop an understanding of basic multiplication facts to 9 × 9 and related division facts.Recall of the multiplication and related division facts up to 5 × 5 is expected by the end of Grade 4. | **Number Unit 5: Fluency with Multiplication and Division Facts**24: Strategies for Multiplication25: Solving Multiplication Problems26: Relating Multiplication and Division27: Strategies for Division29: Consolidation of Fluency with Multiplication and Division Facts**Patterning Unit 1: Patterns and Relations**4: Investigating Number Relationships | **Big Idea: Quantities and numbers can be operated on to determine how many and how much.****Investigating number and arithmetic properties**- Recognizes and generates equivalent numerical expressions using commutative and associative properties.- Understands operational relationships (e.g., inverse relationship between multiplication/division, addition/subtraction).**Developing fluency of operations**- Fluently recalls multiplication and division facts to 100. |
| 4.N.6.Demonstrate an understanding of multiplication (2- or 3-digit numerals by 1-digit numerals) to solve problems by* using personal strategies for multiplication with and without concrete materials
* using arrays to represent multiplication
* connecting concrete representations to symbolic representations
* estimating products
 | **Number Unit 6: Multiplying and Dividing Larger Numbers**30: Exploring Strategies for Multiplying31: Estimating Products35: Consolidation of Multiplying and Dividing Larger Numbers | **Big Idea: Quantities and numbers can be operated on to determine how many and how much.****Developing conceptual meaning of operations**- Models and develops meaning for whole number computation to four digits.**Developing fluency of operations**- Estimates the result of whole number operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?).- 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). |
| 4.N.7. Demonstrate an understanding of division (1-digit divisor and up to 2-digit dividend) to solve problems by * using personal strategies for dividing with and without concrete materials
* estimating quotients
* relating division to multiplication
 | **Number Unit 6: Multiplying and Dividing Larger Numbers**32: Exploring Strategies for Dividing33: Estimating Quotients34: Dividing with Remainders35: Consolidation of Multiplying and Dividing Larger Numbers | **Big Idea: Quantities and numbers can be operated on to determine how many and how much.****Developing conceptual meaning of operations**- Models and develops meaning for whole number computation to four digits.**Developing fluency of operations**- Estimates the results of whole number operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?).- 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). |
| 4.N.8. Demonstrate an understanding of fractions less than or equal to one by using concrete and pictorial representations to* name and record fractions for the parts of a whole or a set
* compare and order fractions
* model and explain that for different wholes, two identical fractions may not represent the same quantity
* provide examples of where fractions are used
 | **Number Unit 3: Fractions**13: What Are Fractions?14: Counting by Unit Fractions15: Exploring Different Representations of Fractions17: Exploring Equivalence in Fractions18: Comparing and Ordering Fractions19: Consolidation of Fractions | **Big Idea: Numbers are related in many ways.****Comparing and ordering quantities (multitude or magnitude)**- Compares, orders, and locates fractions with the same numerator or denominator using reasoning (e.g., $\frac{3}{5}$ > $\frac{3}{6}$ because fifths are larger parts).**Estimating quantities and numbers**- Estimates the size and magnitude of fractions by comparing to benchmarks.**Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.****Partitioning quantities to form fractions**- Partitions fractional parts into smaller fractional parts (e.g., partitions halves into thirds to create sixths).- Uses models to describe, name, and count forward and backward by unit fractions.- Explains that two equivalent fractions represent the same part of a whole, but not necessarily equal quantities (e.g., $\frac{1}{2}$ of a set of 12 and $\frac{1}{2}$ of a set of 6 are equal fractions, but unequal quantities).  |
| 4.N.9. Represent and describe decimals (tenths and hundredths), concretely, pictorially, and symbolically. | **Number Unit 4: Decimals**20: Exploring Tenths21: Exploring Hundredths23: Consolidation of Decimals | **Big Idea: The set of real numbers is infinite.Extending whole number understanding to the set of real numbers**- Explores decimal fractions to tenths (e.g., 0.1, 0.5, 0.8) and hundredths (e.g., 0.42, 0.05, 0.90).**Big Idea: Numbers are related in many ways.****Estimating quantities and numbers**- Estimates the location of decimals and fractions on a number line.**Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.****Unitizing quantities into base-ten units**- Uses fractions with denominators of 10 to develop decimal fraction understanding and notation (e.g., five-tenths is $\frac{5}{10}$ or 0.5).- Counts forwards and backwards by decimal units (e.g., 0.1, 0.2, … 0.9, 1.0).- Understands that the value of a digit is ten times the value of the same digit one place to the right.- 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). |
| 4.N.10. Relate decimals to fractions (to hundredths). | **Number Unit 4: Decimals**20: Exploring Tenths21: Exploring Hundredths23: Consolidation of Decimals | **Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.****Unitizing quantities into base-ten units**- Uses fractions with denominators of 10 to develop decimal fraction understanding and notation (e.g., five-tenths is $\frac{5}{10}$ or 0.5). |
| 4.N.11. Demonstrate an understanding of addition and subtraction of decimals (limited to hundredths) by* using compatible numbers
* estimating sums and differences
* using mental math strategies

to solve problems. | **Number Unit 7: Operations with Fractions and Decimals**36: Estimating Sums and Differences with Decimals37: Adding and Subtracting Decimals38: Using Mental Math to Add and Subtract Decimals39: 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**- Estimates sums and differences of decimal numbers (e.g., calculating cost of transactions involving dollars and cents).- Solves decimal number computation using efficient strategies. |

**Correlation of Manitoba Program of Studies with Mathology Grade 4
(Patterns and Relations: Patterns)**

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| **Curriculum Expectations** | **Grade 4 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**4.PR.1. Identify and describe patterns found in tables and charts, including a multiplication chart. | **Patterning Unit 1: Patterns and Relations**2: Investigating Increasing and Decreasing Patterns3: Representing Patterns4: Investigating Number Relationships6: Consolidation of Patterns and Relations | **Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.****Representing patterns, relations, and functions**- Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule.**Generalizing and analyzing patterns, relations, and functions**- 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. |
| 4.PR.2. Reproduce a pattern shown in a table or chart using concrete materials. | **Patterning Unit 1: Patterns and Relations**3: Representing Patterns6: Consolidation of Patterns and Relations | **Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.****Representing patterns, relations, and functions**- Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule.- Uses multiple approaches to model situations involving repetition (i.e., repeating patterns) and change (i.e., increasing/decreasing patterns) (e.g., using objects, tables, graphs, symbols, loops and nested loops in coding).**Generalizing and analyzing patterns, relations, and functions**- 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. |
| 4.PR.3. Represent and describe patterns and relationships using charts and tables to solve problems. | **Patterning Unit 1: Patterns and Relations**2: Investigating Increasing and Decreasing Patterns3: Representing Patterns6: Consolidation of Patterns and Relations | **Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.****Representing patterns, relations, and functions**- Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule.**Generalizing and analyzing patterns, relations, and functions**- 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. |
| 4.PR.4. Identify and explain mathematical relationships using charts and diagrams to solve problems. | **Pattern Unit 1: Patterns and Relations**4: Investigating Number Relationships5: Sorting in Venn Diagrams and Carroll Diagrams6: Consolidation of Patterns and Relations | **Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.****Representing patterns, relations, and functions**- Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule.**Generalizing and analyzing patterns, relations, and functions**- 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. |

**Correlation of Manitoba Program of Studies with Mathology Grade 4
(Patterns and Relations: Variables and Equations)**

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| **Curriculum Expectations** | **Grade 4 Mathology.ca** | **Pearson Canada Grades 4-6 Mathematics Learning Progression** |
| **General Learning Outcome:**Represent algebraic expressions in multiple ways. |
| **Specific Learning Outcomes**4.PR.5. Express a problem as an equation in which a symbol is used to represent an unknown number. | **Patterning Unit 2: Variables and Equations**7: Using Symbols8: Solving Equations Concretely9: Solving Addition and Subtraction Equations11: Solving Multiplication and Division Equations12: Using Equations to Solve Problems 13: Consolidation of Variables and 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**- Expresses a one-step mathematical problem as an equation using a symbol or letter to represent an unknown number (e.g., Sena had some tokens and used four. She has seven left: □ – 4 = 7).**Using variables, algebraic expressions, and equations to represent mathematical relations**- Understands an unknown quantity (i.e., variable) may be represented by a symbol or letter (e.g., 13 – □ = 8; 4*n* = 12).- Flexibly uses symbols and letters to represent unknown quantities in equations (e.g., knows that 4 + □ = 7; 4 + *x* = 7; and 4 + *y* = 7 all represent the same equation with □, *x*, and *y* representing the same value).- Interprets and writes algebraic expressions (e.g., 2*n* 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., 5*s*, where *s* can be any value). |
| 4.PR.6. Solve one-step equations involving a symbol to represent an unknown number. | **Patterning Unit 2: Variables and Equations**8: Solving Equations Concretely9: Solving Addition and Subtraction Equations11: Solving Multiplication and Division Equations12: Using Equations to Solve Problems 13: Consolidation of Variables and 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**- Determines an unknown number in simple one-step equations using different strategies (e.g., *n* × 3 = 12; 13 – □ = 8).- Uses arithmetic properties to investigate and transform one-step addition and multiplication equations (e.g., 5 + 4 = 9 and 5 + *a* = 9 have the same structure and can be rearranged in similar ways to maintain equality: 4 + 5 = 9 and *a* + 5 = 9).- Uses arithmetic properties to investigate and transform one-step subtraction and division equations (e.g., 12 – 5 = 7 and 12 – *b* = 7 have the same structure and can be rearranged in similar ways to maintain equality: 12 – 7 = 5 and 12 – 7 = *b*). |

**Correlation of Manitoba Program of Studies with Mathology Grade 4
(Shape and Space: Measurement)**

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| **Curriculum Expectations** | **Grade 4 Mathology.ca** | **Pearson Canada Grades 4-6 Mathematics Learning Progression** |
| **General Learning Outcome:**Use direct or indirect measurement to solve problems. |
| **Specific Learning Outcomes**4.SS.1. Read and record time using digital and analog clocks, including 24-hour clocks. | **Measurement Unit 3: Time** 12: Exploring Time13: Telling Time in One- and Five-Minute Intervals14: Telling Time on a 24-Hour Clock18: Consolidation of Time | **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**- Reads and records time (i.e., digital and analogue) and calendar dates.**Understanding relationships among measured units** - Understands relationship among different measures of time (e.g., seconds, minutes, hours, days, decades). |
| 4.SS.2.Read and record calendar dates in a variety of formats. | **Measurement Unit 3: Time**17: Exploring Calendar Dates18: Consolidation of Time | **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**- Reads and records time (i.e., digital and analogue) and calendar dates.**Understanding relationships among measured units**- Understands relationship among different measures of time (e.g., seconds, minutes, hours, days, decades). |
| 4.SS.3. Demonstrate an understanding of area of regular and irregular 2-D shapes by * recognizing that area is measured in square units
* selecting and justifying referents for the units cm2 or m2
* estimating area by using referents for cm2 or m2
* determining and recording area (cm2 or m2)
* constructing different rectangles for a given area (cm2 or m2) in order to demonstrate that many different rectangles may have the same area
 | **Measurement Unit 1: Length, Perimeter, and Area**4: Estimating and Measuring Area in Square Metres5: Estimating and Measuring Area in Square Centimetres6: Exploring the Area of Rectangles7: Consolidation of Length, Perimeter, and Area | **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 area as an attribute of 2-D shapes that can be measured and compared.**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**- Develops understanding of square units (e.g., square unit, square cm, square m) to measure area of 2-D shapes. |



**Correlation of Manitoba Program of Studies with Mathology Grade 4
(Shape and Space: 3-D Objects and 2-D Shapes)**

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| **Curriculum Expectations** | **Grade 4 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** 4.SS.4. Solve problems involving 2-D shapes and 3-D objects. | **Geometry Unit 1A: 2-D Shapes and 3-D Solids**1: Exploring Congruence3: Constructing Models of Prisms5: Consolidation of 2-D Shapes and 3-D Solids | **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 3-D objects based on edges, faces, vertices, and angles (e.g., prisms, pyramids).**Exploring 2-D shapes and 3-D solids by applying and visualizing transformations**- Demonstrates an understanding of congruency (i.e., same side lengths and angles). |
| **Specific Learning Outcomes** 4.SS.5. Describe and construct rectangular and triangular prisms. | **Geometry Unit 1A: 2-D Shapes and 3-D Solids**2: Identifying and Describing Prisms3: Constructing Models of Prisms5: Consolidation of 2-D Shapes and 3-D Solids | **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 3-D objects based on edges, faces, vertices, and angles (e.g., prisms, pyramids).**Investigating 2-D shapes, 3-D solids, and their attributes through composition and decomposition**- Identifies and constructs nets for 3-D objects made from triangles and rectangles. |



**Correlation of Manitoba Program of Studies with Mathology Grade 4
(Shape and Space: Transformations)**

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| **Curriculum Expectations** | **Grade 4 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** 4.SS.6. Demonstrate an understanding of line symmetry by* identifying symmetrical 2-D shapes
* creating symmetrical 2-D shapes
* drawing one or more lines of symmetry in a 2-D shape
 | **Geometry Unit 1A: 2-D Shapes and 3-D Solids**4: Understanding Line Symmetry5: Consolidation of 2-D Shapes and 3-D Solids | **Big Ideas: 2-D shapes and 3-D solids can be transformed in many ways and analyzed for change.Exploring symmetry to analyze 2-D shapes and 3-D solids** - Draws and identifies lines of symmetry (i.e., vertical, horizontal, diagonal, oblique) in 2-D shapes and designs. |



**Correlation of Manitoba Program of Studies with Mathology Grade 4
(Statistics and Probability: Data Analysis)**

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| **Curriculum Expectations** | **Grade 4 Mathology.ca** | **Pearson Canada Grades 4-6 Mathematics Learning Progression** |
| **General Learning Outcome:**Collect, display, and analyze data to solve problems. |
| **Specific Learning Outcomes**4.SP.1. Demonstrate an understanding of many-to-one correspondence. | **Data Management Unit 1A: Data Management**1: Interpreting and Drawing Pictographs2: Interpreting and Drawing Bar Graphs3: Comparing Graphs4: 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.****Reading and interpreting data displays and analyzing variability-** Reads and interprets data displays using many-to-one correspondence. |
| 4.SP.2. Construct and interpret pictographs and bar graphs involving many-to-one correspondence to draw conclusions. | **Data Management Unit 1A: Data Management**1: Interpreting and Drawing Pictographs2: Interpreting and Drawing Bar Graphs3: Comparing Graphs4: 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.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).**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 based on data presented. |