Correlation of Nova Scotia Program of Studies with Mathology
Grade 4 (Number)

Curriculum Expectations	Grade 4 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Curriculum Outcome: Demonstrate number sense.		
Specific Curriculum Outcomes N01: Students will be expected to represent and partition whole numbers to 10 000.	**Number Unit 1: Number Relationships and Place Value** 1: Representing Numbers to 10 000 2: Composing and Decomposing Larger Numbers 6: 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.
N02: Students will be expected to compare and order numbers to 10 000.	**Number Unit 1: Number Relationships and Place Value** 4: Comparing and Ordering Numbers 6: 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.
N03: Students will be expected to demonstrate an understanding of addition and subtraction of numbers with answers to 10 000 (limited to three- and four-digit numerals) by • using personal strategies for adding and subtracting • estimating sums and differences	**Number Unit 2: Fluency with Addition and Subtraction** 7: Estimating Sums and Differences 8: Modelling Addition and Subtraction 9: Adding and Subtracting Larger Numbers 10: Using Mental Math to Add and Subtract 11: Creating and Solving Problems	**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).

• solving problems involving addition and subtraction	12: Consolidation of Fluency with Addition and Subtraction	**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).
N04: Students will be expected to apply and explain 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 Multiplication 27: Strategies for Division 29: 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).
N05: Students will be expected to describe and apply mental mathematics strategies, to recall basic multiplication facts to 9 × 9 and to determine related division facts.	**Number Unit 5: Fluency with Multiplication and Division Facts** 24: Strategies for Multiplication 25: Solving Multiplication Problems 26: Relating Multiplication and Division 27: Strategies for Division 29: 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.
N06: Students will be expected to demonstrate an understanding of multiplication (one-, two-, or three-digit by one-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 Multiplying 31: Estimating Products 35: 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).

• applying the distributive property		
N07: Students will be expected to demonstrate an understanding of division (one-digit divisor and up to two-digit dividend) to solve problems by • using personal strategies for dividing, with and without concrete materials • estimating quotients • relating division to multiplication	**Number Unit 5: Fluency with Multiplication and Division Facts** 27: Strategies for Division 29: Consolidation of Fluency with Multiplication and Division Facts **Number Unit 6: Multiplying and Dividing Larger Numbers** 32: Exploring Strategies for Dividing 33: Estimating Quotients 34: Dividing with Remainders 35: 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).
N08: Students will be expected to demonstrate an understanding of fractions less than or equal to 1 by using concrete, pictorial, and symbolic representations to • name and record fractions for the parts of one 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 Fractions 15: Exploring Different Representations of Fractions 17: Exploring Equivalence in Fractions 18: Comparing and Ordering Fractions 19: 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).

N09: Students will be expected to describe and represent decimals (tenths and hundredths), concretely, pictorially, and symbolically.	**Number Unit 4: Decimals** 20: Exploring Tenths 21: Exploring Hundredths 23: 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).
N10: Students will be expected to relate decimals to fractions and fractions to decimals (to hundredths).	**Number Unit 4: Decimals** 20: Exploring Tenths 21: Exploring Hundredths 23: 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).
N11: Students will be expected to demonstrate an understanding of addition and subtraction of decimals (limited to hundredths) by • estimating sums and differences • using mental mathematics strategies to solve problems • using personal strategies to determine sums and differences	**Number Unit 7: Operations with Fractions and Decimals** 36: Estimating Sums and Differences with Decimals 37: Adding and Subtracting Decimals 38: Using Mental Math to Add and Subtract Decimals 39: 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 Nova Scotia Program of Studies with Mathology
Grade 4
(Patterns and Relations)

Curriculum Expectations	Grade 4 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Curriculum Outcome: Use patterns to describe the world and solve problems.		
Specific Curriculum Outcomes PR01: Students will be expected to identify and describe patterns found in tables and charts, including a multiplication chart.	**Patterning Unit 1: Patterns and Relations** 2: Investigating Increasing and Decreasing Patterns 3: Representing Patterns 4: Investigating Number Relationships 6: 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.
PR02: Students will be expected to translate among different representations of a pattern (a table, a chart, or concrete materials).	**Patterning Unit 1: Patterns and Relations** 3: Representing Patterns 6: 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.
PR03: Students will be expected to represent, describe, and extend patterns and relationships, using charts and tables, to solve problems.	**Patterning Unit 1: Patterns and Relations** 2: Investigating Increasing and Decreasing Patterns 3: Representing Patterns 6: 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.
PR04: Students will be expected to identify and explain mathematical relationships, using charts and diagrams, to solve problems.	**Pattern Unit 1: Patterns and Relations** 4: Investigating Number Relationships 5: Sorting in Venn Diagrams and Carroll Diagrams 6: 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.
General Curriculum Outcome: Represent algebraic expressions in multiple ways.		
Specific Curriculum Outcomes PR05: Students will be expected to express a given problem as an equation in which a symbol is used to represent an unknown number.	**Patterning Unit 2: Variables and Equations** 7: Using Symbols 8: Solving Equations Concretely 9: Solving Addition and Subtraction Equations 11: Solving Multiplication and Division Equations 12: 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: $\square - 4 = 7$).

| | | **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; 4n = 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., 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). |
| PR06: Students will be expected to solve one-step equations involving a symbol to represent an unknown number. | **Patterning Unit 2: Variables and Equations**
8: Solving Equations Concretely
9: Solving Addition and Subtraction Equations
11: Solving Multiplication and Division Equations
12: 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 Nova Scotia Program of Studies with Mathology
Grade 4
(Measurement)

Curriculum Expectations	Grade 4 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Outcome: Use direct and indirect measure to solve problems.		
Specific Curriculum Outcomes M01: Students will be expected to read and record time using digital and analog clocks, including 24-hour clocks.	**Measurement Unit 3: Time** 12: Exploring Time 13: Telling Time in One- and Five-Minute Intervals 14: Telling Time on a 24-Hour Clock 16: Exploring Elapsed Time 18: 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).
M02: Students will be expected to read and record calendar dates in a variety of formats.	**Measurement Unit 3: Time** 17: Exploring Calendar Dates 18: 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).
M03: Students will be expected to 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 square centimetre (cm²) or square metre (m²)	**Measurement Unit 1: Length, Perimeter, and Area** 4: Estimating and Measuring Area in Square Metres 5: Estimating and Measuring Area in Square Centimetres 6: Exploring the Area of Rectangles	**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.

• estimating area using referents for cm^2 or m^2 • determining and recording area (cm^2 or m^2) • constructing different rectangles for a given area (cm^2 or m^2) in order to demonstrate that many different rectangles may have the same area	7: Consolidation of Length, Perimeter, and Area	**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 Nova Scotia Program of Studies with Mathology
Grade 4
(Geometry)

Curriculum Expectations	Grade 4 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Curriculum Outcome: Describe the characteristics of 3-D objects and 2-D shapes and analyze the relationships among them.		
Specific Curriculum Outcomes G01: Students will be expected to describe and construct rectangular and triangular prisms.	**Geometry Unit 1A: 2-D Shapes and 3-D Solids** 2: Identifying and Describing Prisms 3: Constructing Models of Prisms 5: 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.
General Curriculum Outcome: Describe and analyze position and motion of objects and shapes.		
Specific Curriculum Outcomes G02: Students will be expected to demonstrate an understanding of congruency, concretely and pictorially.	**Geometry Unit 1A: 2-D Shapes and 3-D Solids** 1: Exploring Congruence 5: 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 2-D shapes and 3-D solids by applying and visualizing transformations** - Demonstrates an understanding of congruency (i.e., same side lengths and angles).
G03: Students will be expected to 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 Symmetry 5: 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 Nova Scotia Program of Studies with Mathology
Grade 4
(Statistics and Probability)

Curriculum Expectations	Grade 4 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
General Curriculum Outcome: Collect, display, and analyze data to solve problems.		
Specific Curriculum Outcomes SP01: Students will be expected to demonstrate an understanding of many-to-one correspondence.	**Data Management Unit 1A: Data Management** 1: Interpreting and Drawing Pictographs 2: Interpreting and Drawing Bar Graphs 3: Comparing Graphs 4: 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.
SP02: Students will be expected to 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 Pictographs 2: Interpreting and Drawing Bar Graphs 3: Comparing Graphs 4: 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.