Pacing Guide - Mathematics 4

Every September, teachers work hard to create a space that is safe and welcoming for all learners. The first weeks are a time to establish a sense of community, engage learners in rich interactive experiences to promote critical thinking and create opportunities for collaboration and discussion. This is an opportune time to develop a culture and a climate for mathematics learning, conducive to collaboration, risk taking and inquiry.

The following is a pacing guide for Mathematics 4, which provides an overview of the twelve units. It is a reference tool to support teachers with the timing of yearlong learning. Teachers are encouraged to use their professional judgement and consider the needs of their students when planning for instruction. **For the purposes of planning your mathematics lessons, refer to the Mathematics 4 curriculum document and Mathematics 4 Outcomes (2022) that provide essential background information and describe learning opportunities and assessment tasks for each of the outcomes in the unit.**

The Year at a Glance	
Unit # and Title	**Outcomes**
Develop a Culture and Climate for Mathematics Learning (ongoing throughout each unit)	Nova Scotia's Inclusive Education Policy
Unit 1 Numbers to 10 000	N01, N02, PR04
Unit 2 Patterning and Time (M02 removed)	PR01, PR02, PR03, M01
Unit 3 Multiplication and Division – Basic Facts	N04, N05, PR01, PR05
Unit 4 Statistics	SP01, SP02
Unit 5 Addition and Subtraction of Whole Numbers (to 10 000)	N03, PR05, PR06
Unit 6 Geometry (G02 removed)	G01, G03
Unit 7 Multiplication (one-digit multipliers)	N06, PR05, PR06
Unit 8 Measurement - Area	M03
Unit 9 Fractions	N08

Unit 10 Fractions, Decimals, and Addition and Subtraction of Decimal Numbers	N09, N10, N11
Unit 11 Division (one-digit divisors)	N07
Unit 12 Patterns and Relations with a Focus on Multiplication and Division	PR01, PR02, PR03, PR05, PR06

Mathematics 4 - Unit 1 - Numbers to 10 000 (approximately 3 weeks)

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
N01 Students will be expected to represent and partition whole numbers to 10 000. **N02** Students will be expected to compare and order numbers to 10 000. **PR04** Students will be expected to identify and explain mathematical relationships, using charts and diagrams, to solve problems. (PR04.01, PR04.02, PR04.03 removed)	In this first unit focused on numbers to 10 000, students will explore big ideas about Number using concrete materials, pictures, oral and written language, and symbols, in real life contexts. We will know they are successful when they can: **Representing Numbers:** • **read** a given four-digit numeral without using the word "and." (N01.01) • **record** numerals for numbers expressed orally, concretely, pictorially, and/or symbolically as expressions, using proper spacing without commas (ex. base-ten blocks placed in random order, expressions and expanded form with place values out of sequence or with 0 place holders, etc.). (N01.02) • **write** a given numeral, 0 to 10 000, in words (N01.03) **** correct spelling is not required*** • **represent** a given numeral using a place-value chart or diagrams (N01.04) • **express** a given numeral in expanded notation (e.g., 4321 = 4000 + 300 + 20 + 1) (N01.05) • **write** the numeral represented by a given expanded notation (N01.06) • **explain** the meaning of each digit in a given four-digit numeral (N01.07) • **represent** a given number in a variety of ways and explain how they are equivalent (N01.08) • **read** a given number word, 0 to 10 000 (N01.09) • **represent** a given number using expressions (N01.10) **** At this point in the year, students are beginning to develop meaning for numbers from 1 000 to 10 000. It would be appropriate for students to be working with any four-digit numbers, however, proficiency with the full range of numbers 1000 to 10 000 is not expected in unit 1.*** **Comparing and Ordering:** • **order** a given set of numbers in ascending or descending order, and explain the order by making references to place value (N02.01) • **create** and **order** three different four-digit numerals (N02.02) • **identify** the missing numbers in an ordered sequence and on a number line. (N02.03) • **identify** incorrectly placed numbers in an ordered sequence and on a number line (N02.04) • **place** numbers in relative order on an open number line (N02.05) • **place** numbers on a number line containing benchmark numbers for the purpose of comparison (N02.06) • **compare** numbers based on a variety of methods (N02.07) **Patterns and Relations:** • **identify** a sorting rule for a given Venn diagram (PR.04.04) • **describe** the relationship shown in a given Venn diagram when the circles overlap, when one circle is contained in the other, and when the circles are separate (PR04.05) • **determine** where new elements belong in a given Venn diagram (PR04.06) • **solve** a given problem by using a chart or diagram to identify mathematical relationships (PR04.07).	In this unit, students are expected to demonstrate understanding of addition and subtraction of numbers with answers to 10 000 (limited to three- and four-digit numerals). We will know they are successful when they can: • **estimate** sums and differences (N03.05) • **explain** mental mathematics strategies that could be used to determine a sum or difference. (pg. 193-196) (N03.07) • **determine** a sum or difference of one-, two-, and three-digit numerals efficiently, using mental mathematics strategies (pg. 196-198) (N03.08)	See the curriculum document for: • Assessment Tasks • Suggested Learning Tasks • Ideas for Planning for Instruction • Suggested Models and Manipulatives • Mathematical Language (teacher/student) • Performance Indicator Background (see Appendix) N01 pp. 32-37 N02 pp. 33-38 PR04 pp. 111-116 **Math Makes Sense 4:** Unit 2 Lessons 1, 2, 3 (Note: In Unit 2 Lesson 3, it is no longer an expectation to do Carroll diagrams.)

Mathematics 4 - Unit 2 - Patterning and Time (approximately 3 weeks)

**Note: (M02 removed)
M02: Students will be expected to read and record calendar dates in a variety of formats.

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
PR01 Students will be expected to identify and describe patterns found in tables and charts, including a multiplication chart. **PR02** Students will be expected to translate among different representations of a pattern (a table, a chart, or concrete materials). **PR03** Students will be expected to represent, describe, and extend patterns and relationships, using charts and tables, to solve problems. **M01** Students will be expected to read and record time using digital and analog clocks, including 24-hour clocks.	This unit focuses on patterns involving whole numbers, and addition and subtraction. As such, it may provide opportunities to revisit numbers to 10 000 from Unit 1. Students will also explore time and calendar. We will know students are successful when they can: **Patterns and Relations:** ● **determine** the missing element(s) in a given table or chart (PR01.02) ● **identify** the error(s) in a given table or chart (PR01.03) ● **describe** the pattern found in a given table or chart (PR01.04) ● **create** a table or chart from a given concrete representation of a pattern (PR02.01) ● **create** a concrete representation of a given pattern displayed in a table or chart (PR02.02) ● **translate** between pictorial, contextual, and concrete representations of a pattern (PR02.03) ● **explain** why the same relationship exists between the pattern in a table and its concrete representation (PR02.04) ● **translate** the information in a given problem into a table or chart (PR03.01) ● **identify, describe, and extend** the patterns in a table or chart to solve a given problem (PR03.02) ***Please note: Patterns with multiplication charts will be explored in Unit 3.*** **Measurement:** ● **state** the number of hours in a day (M01.01) ● **express** the time orally and numerically from a 12-hour analog clock (M01.02) ● **express** the time orally and numerically from a 24-hour analog clock (M01.03) ● **express** the time orally and numerically from a 12-hour digital clock (M01.04) ● **express** time orally and numerically from a 24-hour digital clock (M01.05) ● **describe** time orally as “minutes to” or “minutes after” the hour (M01.06) ● **explain** the meaning of a.m. and p.m., and **provide** an example of an activity that occurs during the a.m., and another that occurs during the p.m. (M01.07)	In this unit, students are expected to demonstrate understanding of addition and subtraction of numbers with answers to 10 000 (limited to three- and four-digit numerals). We will know they are successful when they can: ● **estimate** sums and differences (N03.05) ● **explain** mental mathematics strategies that could be used to determine a sum or difference. (pg. 193-196) (N03.07) ● **determine** a sum or difference of one-, two-, and three-digit numerals efficiently, using mental mathematics strategies (pg. 196-198) (N03.08)	**See the curriculum document for:** ● Assessment Tasks ● Suggested Learning Tasks ● Ideas for Planning for Instruction ● Suggested Models and Manipulatives ● Mathematical Language (teacher/student) ● Performance Indicator Background (see Appendix) PR01 pp. 94-98 PR02 pp. 99-104 PR03 pp. 105-110 M01 pp. 130-134 **Math Makes Sense 4:** Unit 1: Lessons 1, 2, and 3 Unit 4: Lessons 2- 6

Mathematics 4 - Unit 3 - Multiplication and Division – Basic Facts (approximately 4 weeks)

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
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. **N04** Students will be expected to apply and explain the properties of 0 and 1 for multiplication and the property of 1 for division. **PR01** Students will be expected to identify and describe patterns found in tables and charts, including a multiplication chart. **PR05** Students will be expected to express a given problem as an equation in which a symbol is used to represent an unknown number.	This unit will provide a focused four-week investigation of multiplication and division facts with the understanding that this work **<u>will continue throughout the year</u>** as students develop, practice, and implement mental mathematics strategies to recall their basic multiplication facts by the end of the year. During this unit, students will represent and solve problems involving basic multiplication facts (to 9 x 9) and related division facts using concrete materials, arrays, equal groups, number lines, pictures, and symbols. In this way, they will develop visualization strategies for multiplication and division. We will know students are successful when they **<u>begin</u>** to: **<u>Multiplication and Division (Beginning of Basic Facts Learning):</u>** ● **describe** the mental mathematics strategy used to determine basic multiplication or division facts (N05.01) ● **use and describe** a personal strategy for determining the multiplication facts (N05.02) ● **use and describe** a personal strategy for determining the division facts (N05.03) ● quickly **recall** basic multiplication facts up to 9 × 9 (N05.04) ***See pg. 201-206 for suggested sequence of basic fact strategies.*** **<u>Multiplication (Properties of 0 and 1) and Division (Property of 1):</u>** ● **determine** the answer to a given question involving the multiplication of a number by 1, and explain the answer using the property of 1 in multiplication (N04.01) ● **determine** the answer to a given question involving the multiplication of a number by 0, and explain the answer using the property of 0 in multiplication (N04.02) ● **determine** the answer to a given question involving the division of a number by 1, and explain the answer using the property of 1 in division (N04.03) **<u>Patterns and Relations:</u>** ● **identify** and **describe** a variety of patterns in a multiplication chart (PR01.01) ● **explain** the purpose of the symbol in a given addition, subtraction, multiplication, or division equation with one unknown (e.g., 36 ÷ □ = 6). (PR05.01) ● **express** a given pictorial or concrete representation of an equation in symbolic form (PR05.02) ● **identify** the unknown in a problem; represent the problem with an equation; and solve the problem concretely, pictorially, and/or symbolically (PR05.03) ● **create** a problem in context for a given equation with one unknown (PR05.04). ***Students will use diagrams and Venn diagrams (PR04) to identify and explain mathematical relationships involving multiplication and division facts.***	In this unit, students will continue to demonstrate understanding of addition and subtraction of numbers with answers to 10 000 (limited to three- and four-digit numerals). We will know they are successful when they can: **<u>Mental Computation and Computational Estimation:</u>** ● **estimate** sums and differences (N03.05) ● **explain** mental mathematics strategies that could be used to determine a sum or difference. (pg. 193-196) (N03.07) ● **determine** a sum or difference of one-, two-, and three-digit numerals efficiently, using mental mathematics strategies (pg. 196-198) (N03.08) **<u>Measurement:</u>** ● **read** and **record** time using digital and analog clocks, including 24-hour clock (M01 - see pg. 130-134)	**<u>See the curriculum document for:</u>** ● Assessment Tasks ● Suggested Learning Tasks ● Ideas for Planning for Instruction ● Suggested Models and Manipulatives ● Mathematical Language (teacher/student) ● Performance Indicator Background (see Appendix) N04 pp. 50-53 N05 pp. 54-59 PR01 pp. 94-98 PR05 pp. 117-122 **Math Makes Sense 4:** Unit 3: Lessons 1–10

Mathematics 4 - Unit 4 - Statistics (approximately 2 weeks)

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
SP01 Students will be expected to demonstrate an understanding of 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.	This unit will focus on pictographs and bar graphs and will introduce many-to-one correspondence. We will know students are successful when they can: **Statistics:** ● **compare** graphs in which the same data has been displayed using one-to-one and many-to-one correspondences, and **explain** how they are the same and different (SP01.01) ● **explain** why many-to-one correspondence is sometimes used rather than one-to-one correspondence (SP01.02) ● **find** examples of graphs in print and electronic media, such as newspapers, magazines, and the Internet, in which many-to-one correspondence is used; and **describe** the correspondence used (SP01.03) ● **identify** an interval and correspondence for displaying a given set of data in a graph, and justify the choice (SP02.01) ● **create** and **label** (with categories, title, and legend) a pictograph to display a given set of data, using many-to-one correspondence, and justify the choice of correspondence used (SP02.02) ● **create** and **label** (with axes and title) a bar graph to display a given set of data, using many-to-one correspondence, and **justify** the choice of interval used (SP02.03) ● **answer** a given question, using a given graph in which data is displayed using many-to-one correspondence (SP02.04). ***Students will have opportunities to use multiplication facts to create many-to-one correspondence in the context of creating and reading graphs.***	In this unit, students will continue to practice strategies for multiplication (with recall) and related division facts. They will: ● **describe** and **apply** mental mathematics strategies, to recall basic multiplication facts to 9 × 9, and to determine related division facts. (N05 - pg. 54-59) ● **apply** and **explain** the properties of 0 and 1 for multiplication and the property of 1 for division. (N04 - pg.50-53)	See the curriculum document for: ● Assessment Tasks ● Suggested Learning Tasks ● Ideas for Planning for Instruction ● Suggested Models and Manipulatives ● Mathematical Language (teacher/student) ● Performance Indicator Background (see Appendix) SP01 pp. 162-166 SP02 pp. 167-172 **Math Makes Sense 4:** Unit 7: Lessons 1–5

Mathematics 4 - Unit 5 - Addition and Subtraction of Whole Numbers (to 10 000) (approximately 4 weeks)

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
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 • solving problems involving addition and subtraction **PR05** Students will be expected to express a given problem as an equation in which a symbol is used to represent an unknown number. **PR06** Students will be expected to solve one-step equations involving a symbol to represent an unknown number.	The focus for this unit is addition and subtraction (up to three- and four-digit numbers). They will use and describe a strategy for determining an estimate and will estimate the solution for a given story problem. Working with three- and four-digit numbers, students will demonstrate understanding of the story structures (see pg. 71 from the Grade 3 Curriculum Guide) for addition and subtraction (join, separate, part-part-whole, and comparison) by acting out, modeling, and solving story problems using concrete materials, pictures, words, and symbols. We will know students are successful when they can: **Addition and Subtraction:** • **represent** concretely, pictorially, and symbolically the addition and subtraction of whole numbers, limited to three- and four-digit numerals (N03.01) • **determine** the sum of two given numbers, limited to three- and four-digit numerals, using a personal strategy, and record the process symbolically (N03.02) • **determine** the difference of two given numbers, limited to three- and four-digit numerals, using a personal strategy, and record the process symbolically (N03.03) • **describe** a situation in which an estimate rather than an exact answer is sufficient (N03.04) • **estimate** sums and differences using different strategies (N03.05) • **create** and **solve** problems that involve addition and subtraction of two or more numbers, limited to three- and four-digit numerals (N03.06) • **explain** mental mathematics strategies that could be used to determine a sum or difference (N03.07) • **determine** a sum or difference of one-, two-, and three-digit numerals efficiently, using mental mathematics strategies (N03.08) **Patterns and Relations** • **explain** the purpose of the symbol in a given **addition, subtraction**, multiplication, or division equation with one unknown (e.g., 36 ÷ □ = 6) (PR05.01) • **express** a given pictorial or concrete representation of an equation in symbolic form (PR05.02) • **identify** the unknown in a problem; represent the problem with an equation; and **solve** the problem concretely, pictorially, and/or symbolically (PR05.03) • **create** a problem in context for a given equation with one unknown (PR05.04) • **represent** and **solve** a given one-step equation concretely, pictorially, or symbolically (PR06.01) • **solve** a given one-step equation using guess and test (PR06.02) • **describe**, orally, the meaning of a given one-step equation with one unknown (PR06.03) • **solve** a given equation when the unknown is on the left or right side of the equation (PR06.04) • **represent** and **solve** a given addition or subtraction problem involving a “part-part-whole” or comparison context using a symbol to represent the unknown (PR06.05) • **solve** equations using a symbol to represent the unknown (PR06.07) ***Modeling and solving addition and subtraction problems will provide opportunity for students to continue to develop meaning for numbers to 10 000 as they represent, and model numbers in a variety of ways. Students will utilize their understanding of place value, partitioning, expanded notation, number lines to support the development and use of personal strategies for addition and subtraction.***	In this unit, students will: **Mental Computation and Computational Estimation:** • **estimate** sums and differences (N03.05) • **explain** mental mathematics strategies that could be used to determine a sum or difference. (pg. 193-196) (N03.07) • **determine** a sum or difference of one-, two-, and three-digit numerals efficiently, using mental mathematics strategies (pg. 196-198) (N03.08) **Multiplication Fact Learning:** • **describe** and **apply** mental mathematics strategies, to recall basic multiplication facts to 9 × 9, and to determine related division facts (N05 - pg. 54-59) • **apply** and **explain** the properties of 0 and 1 for multiplication and the property of 1 for division (N04 - pg.50-53).	See the curriculum document for: • Assessment Tasks • Suggested Learning Tasks • Ideas for Planning for Instruction • Suggested Models and Manipulatives • Mathematical Language (teacher/student) • Performance Indicator Background (see Appendix) N03 pp. 43-49 PR05 pp. 117-122 PR06 pp. 123-126 **Math Makes Sense 4:** Unit 1 : Lessons 4 and 6 Unit 2: Lessons 4–13

Mathematics 4 - Unit 6 - Geometry (approximately 2 weeks)

**Note: (G02 removed)
G02: Students will be expected to demonstrate an understanding of congruency, concretely and pictorially.

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
G01 Students will be expected to describe and construct rectangular and triangular prisms. **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	In this unit, students will focus on 2-D and 3-D geometry. Students will be introduced to line symmetry involving 2-D shapes. We will know students are successful when they can: **Geometry (Rectangular and Triangular Prisms):** ● **identify** and **name** common attributes of rectangular prisms from given sets of rectangular prisms (G01.01) ● **identify** and **name** common attributes of triangular prisms from given sets of triangular prisms (G01.02) ● **sort** a given set of right rectangular and triangular prisms, using the shape of the base (G01.03) ● **construct and describe** a model of a rectangular and a triangular prism, using materials such as pattern blocks or modelling clay (G01.04) ● **construct** rectangular prisms from their nets (G01.05) ● **construct** triangular prisms from their nets (G01.06) ● **identify** examples of rectangular and triangular prisms found in the environment (G01.07) **Geometry (Symmetry):** ● **identify** the characteristics of given symmetrical and non-symmetrical 2-D shapes (G03.01) ● **sort** a given set of 2-D shapes as symmetrical and non-symmetrical (G03.02) ● **complete** a symmetrical 2-D shape, given one-half the shape and its line of symmetry, and **explain** the process (G03.03) ● **identify** lines of symmetry of a given set of 2-D shapes, and **explain** why each shape is symmetrical (G03.04) ● **determine** whether or not a given 2-D shape is symmetrical by **using** an image reflector or by folding and superimposing (G03.05) ● **create** a symmetrical shape with and without manipulatives and **explain** the process (G03.06) ● **provide** examples of symmetrical shapes found in the environment, and **identify** the line(s) of symmetry (G03.07) ● **sort** a given set of 2-D shapes as those that have no lines of symmetry, one line of symmetry, or more than one line of symmetry (G03.08) ● **explain** connections between congruence and symmetry using 2-D shapes (G03.09)	In this unit, students will: **Multiplication Fact Learning:** ● **describe** and **apply** mental mathematics strategies, to recall basic multiplication facts to 9 × 9, and to determine related division facts (N05 - pp. 54-59) ● **apply** and **explain** the properties of 0 and 1 for multiplication and the property of 1 for division (N04 - pp. 50-53) **Mental Computation and Computational Estimation:** ● **estimate** sums and differences (N03.05) ● **explain** mental mathematics strategies that could be used to determine a sum or difference (pp. 193-196) (N03.07) ● **determine** a sum or difference of one-, two-, and three-digit numerals efficiently, using mental mathematics strategies (pp. 196-198) (N03.08)	**See the curriculum document for:** ● Assessment Tasks ● Suggested Learning Tasks ● Ideas for Planning for Instruction ● Suggested Models and Manipulatives ● Mathematical Language (teacher/student) ● Performance Indicator Background (see Appendix) G01 pp.146-150 G03 pp. 155-159 **Math Makes Sense 4:** Unit 6: Lessons 1–7 (Note: there is no longer an expectation to create a conceptual understanding of congruency, concretely and pictorially.)

Mathematics 4 - Unit 7 - Multiplication (one-digit multipliers) (approximately 4 weeks)

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
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 • applying the distributive property **PR05** Students will be expected to express a given problem as an equation in which a symbol is used to represent an unknown number. **PR06** Students will be expected to solve one-step equations involving a symbol to represent an unknown number.	The focus for this unit is multiplication with one-digit multipliers. The relationship between multiplication and division will be explored in the context of problem solving. Note that further development of division involving one-digit divisors and the relationship between division and multiplication will take place in Unit 11. We will know students are successful when they can: **Multiplication:** • **model** a given multiplication problem, using the distributive property (e.g., 8 × 365 = (8 × 300) + (8 × 60) + (8 × 5)) (N06.01) • **model** the multiplication of two given numbers, limited to one-, two-, or three-digit by one-digit numerals, using concrete or visual representations, and **record** the process symbolically (N06.02) • **create** and **solve** multiplication story problems, limited to one-, two-, or three-digit by one-digit numerals, and **record** the process symbolically (N06.03) • **estimate** a product using a personal strategy (e.g., 2 × 243 is close to or a little more than 2 × 200, or close to or a little less than 2 × 250) (N06.04) • **model** and **solve** a given multiplication problem using an array, and **record** the process (N06.05) • **determine** the product of two given numbers using a personal strategy, and **record** the process symbolically (N06.06) **Patterns and Relations:** • **explain** the purpose of the symbol in a given addition, subtraction, **multiplication**, or division equation with one unknown (e.g., 36 ÷ □ = 6) (PR05.01) • **express** a given pictorial or concrete representation of an equation in symbolic form (PR05.02) • **identify** the unknown in a problem; **represent** the problem with an equation; and **solve** the problem concretely, pictorially, and/or symbolically (PR05.03) • **create** a problem in context for a given equation with one unknown (PR05.04) • **represent** and **solve** a given one-step equation concretely, pictorially, or symbolically (PR06.01) • **solve** a given one-step equation using guess and test (PR06.02) • **describe**, orally, the meaning of a given one-step equation with one unknown (PR06.03) • **solve** a given equation when the unknown is on the left or right side of the equation (PR06.04) • **represent** and **solve** a given multiplication or division problem involving equal grouping or partitioning (equal sharing) using symbols to represent the unknown (PR06.06) • **solve** equations using a symbol to represent the unknown (PR06.07). ***Modeling and solving multiplication problems will provide opportunity for students to continue to develop meaning for numbers and for place value as they represent, and model numbers in a variety of ways.***	In this unit, students will: **Multiplication Fact Learning:** • **describe** and **apply** mental mathematics strategies, to recall basic multiplication facts to 9 × 9, and to determine related division facts (N05 - pg. 54-59) • **apply** and **explain** the properties of 0 and 1 for multiplication and the property of 1 for division (N04 - pg.50-53) **Mental Computation and Computational Estimation:** • **estimate** a product using a personal strategy (N06.04).	See the curriculum document for: • Assessment Tasks • Suggested Learning Tasks • Ideas for Planning for Instruction • Suggested Models and Manipulatives • Mathematical Language (teacher/student) • Performance Indicator Background (see Appendix) N04 pp. 50-53 N05 pp. 54-59 N06 pp. 60-65 PR05 pp. 117-122 PR06 pp. 123-126 **Math Makes Sense 4:** Unit 1: Lesson 5 Unit 8: Lessons 1–7

Mathematics 4 - Unit 8 - Measurement: Area (approximately 2 weeks)

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
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 (cm^2) or square metre (m^2) • 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	In this unit, students will focus on determining the area of a 2D shape and constructing a shape with a given area. We will know students are successful when they can: **Measurement (Area):** • **describe** area as the measure of surface recorded in square units (M03.01) • **Identify a**nd **explain** why the square is the most efficient unit for measuring area (M03.02) • **provide** a referent for a square centimetre, and explain the choice (M03.03) • **provide** a referent for a square metre, and **explain** the choice (M03.04) • **determine** which standard square unit is represented by a given referent (M03.05) • **estimate** the area of a given 2-D shape using personal referents (M03.06) • **determine** the area of a regular 2-D shape, and **explain** the strategy (M03.07) • **determine** the area of an irregular 2-D shape, and **explain** the strategy (M03.08) • **construct** a rectangle for a given area (M03.09) • **demonstrate** that many rectangles are possible for a given area by drawing at least two different rectangles for the same given area (M03.10) ***As students construct rectangles for a given area and demonstrate that many rectangles are possible for a given area, they will have the opportunity to revisit the relationship between multiplication and division.***	In this unit, students will: **Multiplication Fact Learning:** • **describe** and **apply** mental mathematics strategies, to recall basic multiplication facts to 9 × 9, and to determine related division facts (N05 - pp. 54-59) • **apply** and **explain** the properties of 0 and 1 for multiplication and the property of 1 for division (N04 - pp.50-53) **Mental Computation and Computational Estimation:** • **estimate** a product using a personal strategy (N06.04).	See the curriculum document for: • Assessment Tasks • Suggested Learning Tasks • Ideas for Planning for Instruction • Suggested Models and Manipulatives • Mathematical Language (teacher/student) • Performance Indicator Background (see Appendix) M03 pp. 139-144 **Math Makes Sense 4:** Unit 4 Lessons 7–13

Mathematics 4 - Unit 9 - Fractions (approximately 2 weeks)

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
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	This unit will focus on proper fractions less than or equal to one whole. We will know students are successful when they can: **Fractions:** ● **represent** a given fraction of one whole object, region, or a set using concrete materials. (N08.01) ● **identify** a fraction from its given concrete representation (N08.02) ● **name and record** the shaded and non-shaded parts of a given whole object, region, or set (N08.03) ● **represent** a given fraction pictorially by shading parts of a given whole object, region, or set (N08.04) ● **explain** how denominators can be used to compare two given unit fractions with a numerator of 1. (N08.05) ● **order** a given set of fractions that have the same numerator, and explain the ordering (N08.06) ● **order** a given set of fractions that have the same denominator, and explain the ordering (N08.07) ● **identify** which of the benchmarks 0, ½, or 1 is closer to a given fraction (N08.08) ● **name** fractions between two given benchmarks on a number line (N08.09) ● **order** a given set of fractions by placing them on a number line with given benchmarks (N08.10) ● provide examples of instances when two identical fractions may not represent the same quantity (N08.11) ● **provide,** from everyday contexts, an example of a fraction that represents part of a set and an example of a fraction that represents part of one whole (N08.12)	In this unit, students will: **Multiplication Fact Learning:** ● **describe** and **apply** mental mathematics strategies, to recall basic multiplication facts to 9 × 9, and to determine related division facts (N05 - pp. 54-59) ● **apply** and **explain** the properties of 0 and 1 for multiplication and the property of 1 for division (N04 - pp.50-53) **Mental Computation and Computational Estimation:** ● **estimate** a product using a personal strategy (N06.04)	See the curriculum document for: ● Assessment Tasks ● Suggested Learning Tasks ● Ideas for Planning for Instruction ● Suggested Models and Manipulatives ● Mathematical Language (teacher/student) ● Performance Indicator Background (see Appendix) N08 pp. 72-78 **Math Makes Sense 4:** Unit 5 Lessons 1–8

Mathematics 4 - Unit 10 - Fractions, Decimals, and Addition and Subtraction of Decimal Numbers (approximately 4 weeks)

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
N09 Students will be expected to describe and represent decimals (tenths and hundredths) concretely, pictorially, and symbolically. **N10** Students will be expected to relate decimals to fractions and fractions to decimals (to hundredths). **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	This unit will introduce students to decimal numbers (tenths and hundredths), and relating decimals to fractions (tenths and hundredths) and vice versa. As well, students will demonstrate understanding of addition and subtraction of decimal numbers. We will know students are successful when they can: **Decimals:** • **write** the decimal for a given concrete or pictorial representation of part of a set, part of a region, or part of a unit of measure. (N09.01) • **represent** a given decimal using concrete materials or a pictorial representation. (N09.02) • **explain** the meaning of each digit in a given decimal. (N09.03) • **represent** a given decimal using money values (dimes and pennies). (N09.04) • **record** a given money value using decimals. (N09.05) • **provide** examples of everyday contexts in which tenths and hundredths are used. (N09.06) • **model,** using manipulatives or pictures, that a given tenth can be expressed as a hundredth (e.g., 0.9 is equivalent to 0.90, or 9 dimes is equivalent to 90 pennies). (N09.07) • **read** decimal numbers correctly. (N09.08) **Relating Decimals to Fraction and Fractions to Decimals:** • **express**, orally and symbolically, a given fraction with a denominator of 10 or 100 as a decimal. (N10.01) • **read** decimals as fractions (e.g., 0.5 is zero and five tenths). (N10.02) • **express**, orally and symbolically, a given decimal in fraction form. (N10.03) • **express** a given pictorial or concrete representation as a fraction or decimal (N10.04) (e.g., 15 shaded squares on a hundredth grid can be expressed as 0.15 or $\frac{15}{100}$). • **express**, orally and symbolically, the decimal equivalent for a given fraction (e.g., $\frac{50}{100}$ can be expressed as 0.50). (N10.05) **Addition and Subtraction of Decimals:** • **predict** sums and differences of decimals, using estimation strategies. (N11.01) • **solve** problems, including money problems, that involve addition and subtraction of decimals (limited to hundredths), using personal strategies. (N11.02) • **ask** students to determine which problems do not require an exact solution. (N11.03) • **determine** the approximate solution of a given problem not requiring an exact answer. (N11.04) • **count back** change for a given purchase. (N11.05) • **determine a**n exact solution using mental computation strategies. (N11.06)	In this unit, students will: **Multiplication Fact Learning:** • **describe** and **apply** mental mathematics strategies, to recall basic multiplication facts to 9 × 9, and to determine related division facts. (N05 - pg. 54-59) • **apply** and **explain** the properties of 0 and 1 for multiplication and the property of 1 for division. (N04 - pg.50-53) **Mental Computation and Computational Estimation:** • **estimate** a product using a personal strategy (N06.04)	See the curriculum document for: • Assessment Tasks • Suggested Learning Tasks • Ideas for Planning for Instruction • Suggested Models and Manipulatives • Mathematical Language (teacher/student) • Performance Indicator Background (see Appendix) N10 pp. 84-87 N09 pp. 79-82 N11 pp.. 88-92 **Math Makes Sense 4:** Unit 5 Lessons 9–14

Mathematics 4 - Unit 11 - Division (one-digit divisors) (approximately 4 weeks)

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
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	In this unit, students will represent, model, and solve problems involving division (one-digit divisor and up to a two- digit dividend) including division with remainders using concrete materials, arrays, equal groups, number lines, pictures, and symbols. In this way they will develop visualization strategies for division and will relate division to multiplication. We will know students are successful when they can: **Division:** ● **model** the division of two given numbers without a remainder, limited to a one-digit divisor and up to a two-digit dividend, using concrete or visual representations, and record the process pictorially and symbolically (N07.01) ● **model** the division of two given numbers with a remainder, limited to a one-digit divisor and up to a two-digit dividend, using concrete or visual representations, and record the process pictorially and symbolically. (It is not intended that remainders be expressed as decimals or fractions.) (N07.02) ● **solve** a given division problem, using a personal strategy, and record the process symbolically (N07.03) ● **create** and solve division word problems involving a one- or two-digit dividend, and record the process pictorially and symbolically (N07.04) ● **estimate** a quotient using a personal strategy (e.g., 86 ÷ 4 is close to 80 ÷ 4 or close to 80 ÷ 5) (N07.05) ● **solve** a given division problem by relating division to multiplication (e.g., for 80 ÷ 4, we know that 4 × 20 = 80, so 80 ÷ 4 = 20) (N07.06) ***Story problems should include both equal grouping and partitioning (equal sharing) (see N07.04 indicator background on pg. 219).***	In this unit, students will: **Mental Computation and Computational Estimation:** ● **predict** sums and differences of decimals, using estimation strategies. (N11.01) ● **determine** which problems do not require an exact solution. (N11.03) ● **determine** the approximate solution of a given problem not requiring an exact answer. (N11.04) ● **determine** an exact solution using mental computation strategies.(N11.06) ● **estimate** a product using a personal strategy (N06.04) ● **estimate** a quotient using a personal strategy (N07.05) **Multiplication Fact Learning:** ● **describe** and **apply** mental mathematics strategies, to recall basic multiplication facts to 9 × 9, and to determine related division facts. (N05 - pg. 54-59)	See the curriculum document for: ● Assessment Tasks ● Suggested Learning Tasks ● Ideas for Planning for Instruction ● Suggested Models and Manipulatives ● Mathematical Language (teacher/student) ● Performance Indicator Background (see Appendix) N07 pg.66-71 **Math Makes Sense 4:** Unit 8 Lessons 8–11

Mathematics 4 - Unit 12 - Patterns and Relations with a Focus on Multiplication and Division (approximately 2 weeks)

Specific Curriculum Outcomes	Unit Expectations	Mental Mathematics, Number Routines and Retrieval Practice	Resources to Support Planning
PR01 Students will be expected to identify and describe patterns found in tables and charts, including a multiplication chart. **PR02** Students will be expected to translate among different representations of a pattern (a table, a chart, or concrete materials). **PR03** Students will be expected to represent, describe, and extend patterns and relationships, using charts and tables, to solve problems. **PR05** Students will be expected to express a given problem as an equation in which a symbol is used to represent an unknown number. **PR06** Students will be expected to solve one-step equations involving a symbol to represent an unknown number.	This final unit focuses on patterns involving whole numbers and multiplication and division. We will know students are successful when they can: **Patterns and Relations** ● **identify** and **describe** a variety of patterns in a multiplication chart. (PR01.01) ● **determine** the missing element(s) in a given table or chart. (PR01.02) ● **identify** the error(s) in a given table or chart. (PR01.03) ● **describe** the pattern found in a given table or chart. (PR01.04) ● **translate** between pictorial, contextual, and concrete representations of a pattern.(PR02.03) ● **explain** why the same relationship exists between the pattern in a table and its concrete representation. (PR02.04) ● **translate** the information in a given problem into a table or chart (PR03.01) ● **identify, describe, and extend** the patterns in a table or chart to solve a given problem (PR03.02) ● **explain** the purpose of the symbol in a given addition, subtraction**,** multiplication, or **division** equation with one unknown (e.g., 36 ÷ □ = 6). (PR05.01) ● **represent** and **solve** a given multiplication or division problem involving equal grouping or partitioning (equal sharing) using symbols to represent the unknown (PR06.06)	In this unit, students will: **Mental Computation and Computational Estimation:** ● **estimate** a quotient using a personal strategy (N07.05) ● **predict** sums and differences of decimals, using estimation strategies. (N11.01) ● **determine** which problems do not require an exact solution. (N11.03) ● **determine** the approximate solution of a given problem not requiring an exact answer. (N11.04) ● **determine** an exact solution using mental computation strategies.(N11.06) ● **estimate** a product using a personal strategy (N06.04) **Multiplication Fact Learning:** ● **describe** and **apply** mental mathematics strategies, to recall basic multiplication facts to 9 × 9, and to determine related division facts. (N05 - pg. 54-59)	**See the curriculum document for:** ● Assessment Tasks ● Suggested Learning Tasks ● Ideas for Planning for Instruction ● Suggested Models and Manipulatives ● Mathematical Language (teacher/student) ● Performance Indicator Background (see Appendix) PR01 pp. 94-98 PR02 pp. 99-104 PR03 pp. 105-110 PR05 pp. 117-122 PR06 pp. 123-126 **Math Makes Sense 4:** Review