# NUMBER PROGRESSION: WHOLE NUMBERS

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
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| **Saying Number Sequences, Meaningful Counting, and Skip Counting** | **N01** Students will be expected to say the number sequence by<br>▪ 1s, from 1 to 20<br>▪ 1s, starting anywhere from 1 to 10 and from 10 to 1<br><br>**N06** Students will be expected to demonstrate an understanding of counting to 10. | **N01** Students will be expected to say the number sequence by<br>▪ 1s, forward and backward between any two given numbers, 0 to 100<br>▪ 2s to 20, forward starting at 0<br>▪ 5s to 100, forward starting at 0, using a hundred chart or a number line<br>▪ 10s to 100, forward starting at 0, using a hundred chart or a number line<br><br>**N03** Students will be expected to demonstrate an understanding of counting to 20 by<br>▪ indicating that the last number said identifies "how many"<br>▪ showing that any set has only one count using the counting-on strategy<br><br>**N07** Students will be expected to demonstrate an understanding of conservation of number for up to 20 objects. | **N01** Students will be expected to say the number sequence by<br>▪ 1s, forward and backward, starting from any point to 200<br>▪ 2s, forward and backward, starting from any point to 100<br>▪ 5s and 10s, forward and backward, using starting points that are multiples of 5 and 10 respectively to 100<br>▪ 10s, starting from any point, to 100<br><br>**N03** Students will be expected to describe order or relative position using ordinal numbers (up to tenth). | **N01** Students will be expected to say the number sequence forward and backward by<br>▪ 1s through transitions to 1000<br>▪ 2s, 5s, 10s, or 100s, using any starting point to 1000<br>▪ 3s, using starting points that are multiples of 3 up to 100<br>▪ 4s, using starting points that are multiples of 4 up to 100<br>▪ 25s, using starting points that are multiples of 25 up to 200.<br><br>**N03** Students will be expected to compare and order numbers up to 1000. | **N02** Students will be expected to compare and order numbers to 10 000. | **N01** Students will be expected to represent and partition whole numbers to 1 000 000. | **N01** Students will be expected to demonstrate an understanding of place value for numbers greater than one million and less than one-thousandth. | **N07** Students will be expected to compare, order, and position positive fractions, positive decimals (to thousandths), and whole numbers by using benchmarks, place value, and equivalent fractions and/or decimals. | | |
| **Representing and Partitioning Whole Numbers** | **N02** Students will be expected to recognize, at a glance, and name the quantity represented by familiar arrangements of 1 to 5 objects or dots.<br><br>**N03** Students will be expected to relate a numeral, 1 to 10, to its respective quantity.<br><br>**N04** Students will be expected to represent and describe numbers 2 to 10 in two parts, concretely and pictorially. | **N02** Students will be expected to recognize, at a glance, and name the quantity represented by familiar arrangements of 1 to 10 objects or dots.<br><br>**N04** Students will be expected to represent and partition numbers to 20.<br><br>**N06** Students will be expected to estimate quantities to 20 by using referents.<br><br>**N07** Students will be expected to demonstrate an understanding of conservation of number for up to 20 objects. | **N02** Students will be expected to demonstrate if a number (up to 100) is even or odd.<br><br>**N06** Students will be expected to estimate quantities to 100 by using referents.<br><br>**N04** Students will be expected to represent and partition numbers to 100. | **N02** Students will be expected to represent and partition numbers to 1000.<br><br>**N04** Students will be expected to estimate quantities less than 1000 using referents. | **N01** Students will be expected to represent and partition whole numbers to 10 000. | **N01** Students will be expected to represent and partition whole numbers to 1 000 000. | **N01** Students will be expected to demonstrate an understanding of place value for numbers greater than one million and less than one-thousandth. | **N07** Students will be expected to compare, order, and position positive fractions, positive decimals (to thousandths), and whole numbers by using benchmarks, place value, and equivalent fractions and/or decimals. | **N01** Students will be expected to demonstrate an understanding of perfect squares and square roots, concretely, pictorially and symbolically (limited to whole numbers). | |
| **Comparing and Ordering Whole Numbers** | **N05** Students will be expected to compare quantities, 1 to 10, using one-to-one correspondence. | **N05** Students will be expected to compare sets containing up to 20 objects to solve problems using referents and one-to-one correspondence.<br><br>**N08** Students will be expected to identify the number, up to 20, that is one more, two more, one less, and two less than a given number. | **N05** Students will be expected to compare and order numbers up to 100. | **N03** Students will be expected to compare and order numbers up to 1000. | **N02** Students will be expected to compare and order numbers to 10 000. | **N01** Students will be expected to represent and partition whole numbers to 1 000 000. | **N01** Students will be expected to demonstrate an understanding of place value for numbers greater than one million and less than one-thousandth. | **N07** Students will be expected to compare, order, and position positive fractions, positive decimals (to thousandths), and whole numbers by using benchmarks, place value, and equivalent fractions and/or decimals. | | |
| **Place Value – Whole Numbers** | **N01** Students will be expected to say the number sequence by<br>▪ 1s, from 1 to 20<br>▪ 1s, starting anywhere from 1 to 10 and from 10 to 1 | **N02** Students will be expected to recognize, at a glance, and name the quantity represented by familiar arrangements of 1 to 10 objects or dots.<br>**N01** Students will be expected to say the number sequence by<br>▪ 1s, forward and backward between any two given numbers, 0 to 100<br>▪ 2s to 20, forward starting at 0<br>▪ 5s to 100, forward starting at 0, using a hundred chart or a number line<br>▪ 10s to 100, forward starting at 0, using a hundred chart or a number line | **N07** Students will be expected to illustrate, concretely and pictorially, the meaning of place value for numerals to 100. | **N05** Students will be expected to illustrate, concretely and pictorially, the meaning of place value for numerals to 1000. | **N01** Students will be expected to represent and partition whole numbers to 10 000. | **N01** Students will be expected to represent and partition whole numbers to 1 000 000. | **N01** Students will be expected to demonstrate an understanding of place value for numbers greater than one million and less than one-thousandth. | **N07** Students will be expected to compare, order, and position positive fractions, positive decimals (to thousandths), and whole numbers by using benchmarks, place value, and equivalent fractions and/or decimals. | | |

# NUMBER PROGRESSION: DECIMAL NUMBERS

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
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| **Representing Decimal Numbers** | NA | NA | NA | NA | **N09** Students will be expected to describe and represent decimals (tenths and hundredths) concretely, pictorially, and symbolically.<br><br>**N10** Students will be expected to relate decimals to fractions and fractions to decimals (to hundredths). | **N08** Students will be expected to describe and represent decimals (tenths, hundredths, and thousandths) concretely, pictorially, and symbolically.<br><br>**N09** Students will be expected to relate decimals to fractions and fractions to decimals (to thousandths).<br><br>**N10** Students will be expected to compare and order decimals (to thousandths) by using benchmarks, place value, and equivalent decimals. | **N01** Students will be expected to demonstrate an understanding of place value for numbers greater than one million and less than one-thousandth. | **N04** Students will be expected to demonstrate an understanding of the relationship between positive terminating decimals and positive fractions and between positive repeating decimals (with one or two repeating digits) and positive fractions.<br><br>**N07** Students will be expected to compare, order, and position positive fractions, positive decimals (to thousandths), and whole numbers by using benchmarks, place value, and equivalent fractions and/or decimals. | **N03** Students will be expected to demonstrate an understanding of and solve problems involving percents greater than or equal to 0%. | **N03** Students will be expected to demonstrate an understanding of rational numbers by<br>▪ comparing and ordering rational numbers<br>▪ solving problems that involve arithmetic operations on rational numbers |
| **Comparing and Ordering Decimal Numbers** | NA | NA | NA | NA | **N09** Students will be expected to describe and represent decimals (tenths and hundredths) concretely, pictorially, and symbolically. | **N08** Students will be expected to describe and represent decimals (tenths, hundredths, and thousandths) concretely, pictorially, and symbolically.<br><br>**N10** Students will be expected to compare and order decimals (to thousandths) by using benchmarks, place value, and equivalent decimals. | **N01** Students will be expected to demonstrate an understanding of place value for numbers greater than one million and less than one-thousandth. | **N07** Students will be expected to compare, order, and position positive fractions, positive decimals (to thousandths), and whole numbers by using benchmarks, place value, and equivalent fractions and/or decimals.<br><br>**N04** Students will be expected to demonstrate an understanding of the relationship between positive terminating decimals and positive fractions and between positive repeating decimals (with one or two repeating digits) and positive fractions. | | **N03** Students will be expected to demonstrate an understanding of rational numbers by<br>▪ comparing and ordering rational numbers<br>▪ solving problems that involve arithmetic operations on rational numbers |
| **Place Value – Decimal Numbers** | NA | NA | NA | NA | **N09** Students will be expected to describe and represent decimals (tenths and hundredths) concretely, pictorially, and symbolically. | **N08** Students will be expected to describe and represent decimals (tenths, hundredths, and thousandths) concretely, pictorially, and symbolically.<br><br>**N10** Students will be expected to compare and order decimals (to thousandths) by using benchmarks, place value, and equivalent decimals. | **N01** Students will be expected to demonstrate an understanding of place value for numbers greater than one million and less than one-thousandth. | **N07** Students will be expected to compare, order, and position positive fractions, positive decimals (to thousandths), and whole numbers by using benchmarks, place value, and equivalent fractions and/or decimals.<br><br>**N04** Students will be expected to demonstrate an understanding of the relationship between positive terminating decimals and positive fractions and between positive repeating decimals (with one or two repeating digits) and positive fractions. | | |

# NUMBER PROGRESSION: FRACTIONS

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
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| **Representing Fractions** | NA | NA | NA | **N13** Students will be expected to demonstrate an understanding of fractions by<br>▪ explaining that a fraction represents a part of a whole<br>▪ describing situations in which fractions are used<br>▪ comparing fractions of the same whole with like denominators | **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<br>▪ name and record fractions for the parts of one whole or a set<br>▪ compare and order fractions<br>▪ model and explain that for different wholes, two identical fractions may not represent the same quantity<br>▪ provide examples of where fractions are used | **N07** Students will be expected to demonstrate an understanding of fractions by using concrete, pictorial, and symbolic representations to<br>▪ create sets of equivalent fractions<br>▪ compare and order fractions with like and unlike denominators<br><br>**N09** Students will be expected to relate decimals to fractions and fractions to decimals (to thousandths). | **N04** Students will be expected to relate improper fractions to mixed numbers and mixed numbers to improper fractions.<br><br>**N06** Students will be expected to demonstrate an understanding of percent (limited to whole numbers) concretely, pictorially, and symbolically.<br><br>**N05** Students will be expected to demonstrate an understanding of ratio, concretely, pictorially, and symbolically. | **N07** Students will be expected to compare, order, and position positive fractions, positive decimals (to thousandths), and whole numbers by using benchmarks, place value, and equivalent fractions and/or decimals.<br><br>**N04** Students will be expected to demonstrate an understanding of the relationship between positive terminating decimals and positive fractions and between positive repeating decimals (with one or two repeating digits) and positive fractions.<br><br>**SP04** Students will be expected to express probabilities as ratios, fractions, and percents. | **N03** Students will be expected to demonstrate an understanding of and solve problems involving percents greater than or equal to 0%.<br><br>**N05** Students will be expected to solve problems that involve rates, ratios and proportional reasoning.<br><br>**N06** Students will be expected to demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially and symbolically. | **N03** Students will be expected to demonstrate an understanding of rational numbers by<br>▪ comparing and ordering rational numbers<br>▪ solving problems that involve arithmetic operations on rational numbers |
| **Comparing and Ordering Fractions** | NA | NA | NA | **N13** Students will be expected to demonstrate an understanding of fractions by<br>▪ explaining that a fraction represents a part of a whole<br>▪ describing situations in which fractions are used<br>comparing fractions of the same whole with like denominators | **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<br>▪ name and record fractions for the parts of one whole or a set<br>▪ compare and order fractions<br>▪ model and explain that for different wholes, two identical fractions may not represent the same quantity<br>▪ provide examples of where fractions are used | **N07** Students will be expected to demonstrate an understanding of fractions by using concrete, pictorial, and symbolic representations to<br>▪ create sets of equivalent fractions<br>▪ compare and order fractions with like and unlike denominators | **N04** Students will be expected to relate improper fractions to mixed numbers and mixed numbers to improper fractions. | **N07** Students will be expected to compare, order, and position positive fractions, positive decimals (to thousandths), and whole numbers by using benchmarks, place value, and equivalent fractions and/or decimals.<br><br>**N04** Students will be expected to demonstrate an understanding of the relationship between positive terminating decimals and positive fractions and between positive repeating decimals (with one or two repeating digits) and positive fractions. | | **N03** Students will be expected to demonstrate an understanding of rational numbers by<br>▪ comparing and ordering rational numbers<br>▪ solving problems that involve arithmetic operations on rational numbers |

# NUMBER PROGRESSION: OPERATIONS
# ADDITION AND SUBTRACTION

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
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| **Addition and Subtraction – Basic Facts** | **N02** Students will be expected to recognize, at a glance, and name the quantity represented by familiar arrangements of 1 to 5 objects or dots.<br><br>**N04** Students will be expected to represent and describe numbers 2 to 10 in two parts, concretely and pictorially.<br><br>**N05** Students will be expected to compare quantities, 1 to 10, using one-to-one correspondence. | **N08** Students will be expected to identify the number, up to 20, that is one more, two more, one less, and two less than a given number.<br><br>**N02** Students will be expected to recognize, at a glance, and name the quantity represented by familiar arrangements of 1 to 10 objects or dots.<br><br>**N04** Students will be expected to represent and partition numbers to 20. | **N10** Students will be expected to apply mental mathematics strategies to quickly recall basic addition facts to 18 and determine related subtraction facts.<br><br>**N08** Students will be expected to demonstrate and explain the effect of adding zero to or subtracting zero from any number. | **N10** Students will be expected to apply mental mathematics strategies and number properties to develop quick recall of basic addition facts to 18 and related basic subtraction facts. | Basic addition and subtraction facts should be under control and students are expected to recall them when performing addition and subtraction of larger numbers. | Basic addition and subtraction facts should be under control and students are expected to recall them when performing addition and subtraction of larger numbers. | Basic addition and subtraction facts should be under control and students are expected to recall them when performing addition and subtraction of larger numbers. | Basic addition and subtraction facts should be under control and students are expected to recall them when performing addition and subtraction of larger numbers. | Basic addition and subtraction facts should be under control and students are expected to recall them when performing addition and subtraction of larger numbers. | Basic addition and subtraction facts should be under control and students are expected to recall them when performing addition and subtraction of larger numbers. |
| **Addition and Subtraction Mental Mathematics and Estimation** | **N02** Students will be expected to recognize, at a glance, and name the quantity represented by familiar arrangements of 1 to 5 objects or dots.<br><br>**N04** Students will be expected to represent and describe numbers 2 to 10 in two parts, concretely and pictorially. | **N02** Students will be expected to recognize, at a glance, and name the quantity represented by familiar arrangements of 1 to 10 objects or dots.<br><br>**N08** Students will be expected to identify the number, up to 20, that is one more, two more, one less, and two less than a given number.<br><br>**N10** Students will be expected to use and describe strategies to determine sums and differences using manipulatives and visual aids. Strategies include<br>▪ counting on or counting back<br>▪ one more or one less<br>▪ making ten<br>▪ doubles<br>▪ near doubles | **N08** Students will be expected to demonstrate and explain the effect of adding zero to or subtracting zero from any number.<br><br>**N10** Students will be expected to apply mental mathematics strategies to quickly recall basic addition facts to 18 and determine related subtraction facts.<br><br>**N08** Students will be expected to demonstrate and explain the effect of adding zero to or subtracting zero from any number. | **N06** Students will be expected to describe and apply mental mathematics strategies for adding 2 two-digit numerals.<br><br>**N07** Students will be expected to describe and apply mental mathematics strategies for subtracting 2 two-digit numerals.<br><br>**N08** Students will be expected to apply estimation strategies to predict sums and differences of one-, two-, and three-digit numerals in a problem-solving context.<br><br>**N10** Students will be expected to apply mental mathematics strategies and number properties to develop quick recall of basic addition facts to 18 and related basic subtraction facts. | **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<br>▪ using personal strategies for adding and subtracting<br>▪ estimating sums and differences<br>▪ solving problems involving addition and subtraction<br><br>**N11** Students will be expected to demonstrate an understanding of addition and subtraction of decimals (limited to hundredths) by<br>▪ estimating sums and differences<br>▪ using mental mathematics strategies to solve problems<br>▪ using personal strategies to determine sums and differences | **N02** Students will be expected to use estimation strategies, including front-end, front-end adjusted, rounding, and compatible numbers in problem-solving contexts. | **N02** Students will be expected to solve problems involving whole numbers and decimal numbers. | **N02** Students will be expected to demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals to solve problems (for more than one-digit divisors or more than two-digit multipliers, the use of technology is expected). | **N05** Students will be expected to demonstrate an understanding of adding and subtracting positive fractions and mixed numbers, with like and unlike denominators, concretely, pictorially and symbolically (limited to positive sums and differences). | **N03** Students will be expected to demonstrate an understanding of rational numbers by<br>▪ comparing and ordering rational numbers<br>▪ solving problems that involve arithmetic operations on rational numbers |

# NUMBER PROGRESSION: OPERATIONS
# ADDITION AND SUBTRACTION (CONTINUED)

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
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| **Addition and Subtraction – Calculations** | **N02** Students will be expected to recognize, at a glance, and name the quantity represented by familiar arrangements of 1 to 5 objects or dots.<br><br>**N04** Students will be expected to represent and describe numbers 2 to 10 in two parts, concretely and pictorially<br><br>**N05** Students will be expected to compare quantities, 1 to 10, using one-to-one correspondence. | **N08** Students will be expected to identify the number, up to 20, that is one more, two more, one less, and two less than a given number.<br><br>**N09** Students will be expected to demonstrate an understanding of the addition of two single-digit numbers and the corresponding subtraction, concretely, pictorially, and symbolically in join, separate, equalize/compare, and part-part-whole situations.<br><br>**N10** Students will be expected to use and describe strategies to determine sums and differences using manipulatives and visual aids. Strategies include<br>▪ counting on or counting back<br>▪ one more or one less<br>▪ making ten<br>▪ doubles<br>▪ near doubles | **N08** Students will be expected to demonstrate and explain the effect of adding zero to or subtracting zero from any number.<br><br>**N09** Students will be expected to demonstrate an understanding of addition (limited to one- and two digit numerals) with answers to 100 and the corresponding subtraction by<br>▪ using personal strategies for adding and subtracting with and without the support of manipulates<br>▪ creating and solving problems that involve addition and subtraction<br>▪ explaining and demonstrating that the order in which numbers are added does not affect the sum<br>▪ explaining and demonstrating that the order in which numbers are subtracted matters when finding a difference | **N09** Students will be expected to demonstrate an understanding of addition and subtraction of numbers (limited to one-, two-, and three-digit numerals) with answers to 1000 by<br>▪ using personal strategies for adding and subtracting with and without the support of manipulatives<br>▪ creating and solving problems in context that involve addition and subtraction of numbers concretely, pictorially, and symbolically | **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<br>▪ using personal strategies for adding and subtracting<br>▪ estimating sums and differences<br>▪ solving problems involving addition and subtraction<br><br>**N11** Students will be expected to demonstrate an understanding of addition and subtraction of decimals (limited to hundredths) by<br>▪ estimating sums and differences<br>▪ using mental mathematics strategies to solve problems<br>▪ using personal strategies to determine sums and differences | **N02** Students will be expected to use estimation strategies, including front-end, front-end adjusted, rounding, and compatible numbers in problem-solving contexts.<br><br>**N11** Students will be expected to demonstrate an understanding of addition and subtraction of decimals (limited to thousandths). | **N02** Students will be expected to solve problems involving whole numbers and decimal numbers.<br><br>**N09** Students will be expected to explain and apply the order of operations, excluding exponents, with and without technology (limited to whole numbers). | **N02** Students will be expected to demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals to solve problems (for more than one-digit divisors or more than two-digit multipliers, the use of technology is expected).<br><br>**N05** Students will be expected to demonstrate an understanding of adding and subtracting positive fractions and mixed numbers, with like and unlike denominators, concretely, pictorially, and symbolically (limited to positive sums and differences).<br><br>**N06** Students will be expected to demonstrate an understanding of addition and subtraction of integers, concretely, pictorially, and symbolically. | | **N02** Students will be expected to demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole number exponents:<br>▪ $(a^m)(a^n) = a^{m+n}$<br>▪ $a^m \div a^n = a^{m-n}, m$<br>▪ $(a^m)^n = a^{mn}$<br>▪ $(ab)^m = a^m b^m$<br>$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}, b \neq 0.$<br><br>**N03** Students will be expected to demonstrate an understanding of rational numbers by<br>▪ comparing and ordering rational numbers<br>▪ solving problems that involve arithmetic operations on rational numbers<br><br>**N04** Students will be expected to explain and apply the order of operations, including exponents, with and without technology.<br><br>**PR06** Students will be expected to model, record and explain the operations of addition and subtraction of polynomial expressions, concretely, pictorially and symbolically (limited to polynomials of degree less than or equal to 2). |

# NUMBER PROGRESSION: OPERATIONS
# MULTIPLICATION AND DIVISION

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Multiplication and Division – Basic Facts** | | **N01** Students will be expected to say the number sequence by<br>▪ 1s, forward and backward between any two given numbers, 0 to 100<br>▪ 2s to 20, forward starting at 0<br>▪ 5s to 100, forward starting at 0, using a hundred chart or a number line<br>▪ 10s to 100, forward starting at 0, using a hundred chart or a number line | **N01** Students will be expected to say the number sequence by<br>▪ 1s, forward and backward, starting from any point to 200<br>▪ 2s, forward and backward, starting from any point to 100<br>▪ 5s and 10s, forward and backward, using starting points that are multiples of 5 and 10 respectively to 100<br>▪ 10s, starting from any point, to 100 | **N01** Students will be expected to say the number sequence forward and backward by<br>▪ 1s through transitions to 1000<br>▪ 2s, 5s, 10s, or 100s, using any starting point to 1000<br>▪ 3s, using starting points that are multiples of 3 up to 100<br>▪ 4s, using starting points that are multiples of 4 up to 100<br>▪ 25s, using starting points that are multiples of 25 up to 200.<br>**N11** Students will be expected to demonstrate an understanding of multiplication to 5 × 5 by<br>▪ representing and explaining multiplication using equal grouping and arrays<br>▪ creating and solving problems in context that involves multiplication<br>▪ modelling multiplication using concrete and visual representations and recording the process symbolically<br>▪ relating multiplication to repeated addition<br>▪ relating multiplication to division<br>**N12** Students will be expected to demonstrate an understanding of division by<br>▪ representing and explaining division using equal sharing and equal grouping<br>▪ creating and solving problems in context that involve equal sharing and equal grouping<br>▪ modelling equal sharing and equal grouping using concrete and visual representations, and recording the process symbolically<br>▪ relating division to repeated subtraction<br>▪ relating division to multiplication<br>(Limited to division related to multiplication facts up to 5 × 5.) | **N04** Students will be expected to apply and explain the properties of 0 and 1 for multiplication and the property of 1 for division.<br>**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. | **N03** Students will be expected to describe and apply mental mathematics strategies and number properties to recall, with fluency, answers for basic multiplication facts to 81 and related division facts. | Basic multiplication and division facts should be under control and students are expected to recall them when performing multiplication and division.<br>**N02** Students will be expected to solve problems involving whole numbers and decimal numbers. | Basic multiplication and division facts should be under control and students are expected to recall them when performing multiplication and division. | Basic multiplication and division facts should be under control and students are expected to recall them when performing multiplication and division. | Basic multiplication and division facts should be under control and students are expected to recall them when performing multiplication and division. |
| **Multiplication and Division – Mental Mathematics and Estimations** | | | | | **N04** Students will be expected to apply and explain the properties of 0 and 1 for multiplication and the property of 1 for division.<br>**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.<br>**N06** Students will be expected to demonstrate an understanding of multiplication (one-, two-, or three-digit by one-digit numerals) to solve problems by<br>▪ using personal strategies for multiplication, with and without concrete materials<br>▪ using arrays to represent multiplication<br>▪ connecting concrete representations to symbolic representations<br>▪ estimating products<br>▪ applying the distributive property<br>**N07** Students will be expected to demonstrate an understanding of division (one-digit divisor and up to two-digit dividend) to solve problems by<br>▪ using personal strategies for dividing, with and without concrete materials<br>▪ estimating quotients<br>▪ relating division to multiplication | **N03** Students will be expected to describe and apply mental mathematics strategies and number properties to recall, with fluency, answers for basic multiplication facts to 81 and related division facts.<br>**N04** Students will be expected to apply mental mathematics strategies for multiplication, including<br>▪ multiplying by multiples of 10, 100, and 1000<br>▪ halving and doubling<br>▪ using the distributive property<br>**N05** Students will be expected to demonstrate, with and without concrete materials, an understanding of multiplication (two-digit by two-digit) to solve problems.<br>**N06** Students will be expected to demonstrate, with and without concrete materials, an understanding of division (three-digit by one-digit), and interpret remainders to solve problems. | **N02** Students will be expected to solve problems involving whole numbers and decimal numbers.<br>**N08** Students will be expected to demonstrate an understanding of multiplication and division of decimals (one-digit whole number multipliers and one-digit natural number divisors). | **N01** Students will be expected to determine and explain why a number is divisible by 2, 3, 4, 5, 6, 8, 9, or 10, and why a number cannot be divided by 0.<br>**N02** Students will be expected to demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals to solve problems (for more than one-digit divisors or more than two-digit multipliers, the use of technology is expected).<br>**N04** Students will be expected to demonstrate an understanding of the relationship between positive terminating decimals and positive fractions and between positive repeating decimals (with one or two repeating digits) and positive fractions. | **N01** Students will be expected to demonstrate an understanding of perfect squares and square roots, concretely, pictorially and symbolically (limited to whole numbers).<br>**N02** Students will be expected to determine the approximate square root of numbers that are not perfect squares (limited to whole numbers).<br>**N03** Students will be expected to demonstrate an understanding of and solve problems involving percents greater than or equal to 0%.<br>**N05** Students will be expected to solve problems that involve rates, ratios, and proportional reasoning.<br>**N06** Students will be expected to demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially, and symbolically. | |

# NUMBER PROGRESSION: OPERATIONS
# MULTIPLICATION AND DIVISION (CONTINUED)

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
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| **Multiplication and Division - Calculations** | | | | **N11** Students will be expected to demonstrate an understanding of multiplication to 5 × 5 by<br>▪ representing and explaining multiplication using equal grouping and arrays<br>▪ creating and solving problems in context that involves multiplication<br>▪ modelling multiplication using concrete and visual representations and recording the process symbolically<br>▪ relating multiplication to repeated addition<br>▪ relating multiplication to division<br>**N12** Students will be expected to demonstrate an understanding of division by<br>▪ representing and explaining division using equal sharing and equal grouping<br>▪ creating and solving problems in context that involve equal sharing and equal grouping<br>▪ modelling equal sharing and equal grouping using concrete and visual representations, and recording the process symbolically<br>▪ relating division to repeated subtraction<br>▪ relating division to multiplication<br>(Limited to division related to multiplication facts up to 5 × 5.) | **N04** Students will be expected to apply and explain the properties of 0 and 1 for multiplication and the property of 1 for division.<br><br>**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.<br><br>**N06** Students will be expected to demonstrate an understanding of multiplication (one-, two-, or three-digit by one-digit numerals) to solve problems by<br>▪ using personal strategies for multiplication, with and without concrete materials<br>▪ using arrays to represent multiplication<br>▪ connecting concrete representations to symbolic representations<br>▪ estimating products<br>▪ applying the distributive property<br><br>**N07** Students will be expected to demonstrate an understanding of division (one-digit divisor and up to two-digit dividend) to solve problems by<br>▪ using personal strategies for dividing, with and without concrete materials<br>▪ estimating quotients<br>▪ relating division to multiplication | **N03** Students will be expected to describe and apply mental mathematics strategies and number properties to recall, with fluency, answers for basic multiplication facts to 81 and related division facts.<br><br>**N04** Students will be expected to apply mental mathematics strategies for multiplication, including<br>▪ multiplying by multiples of 10, 100, and 1000<br>▪ halving and doubling<br>▪ using the distributive property<br><br>**N05** Students will be expected to demonstrate, with and without concrete materials, an understanding of multiplication (two-digit by two-digit) to solve problems.<br><br>**N06** Students will be expected to demonstrate, with and without concrete materials, an understanding of division (three-digit by one-digit), and interpret remainders to solve problems. | **N02** Students will be expected to solve problems involving whole numbers and decimal numbers.<br><br>**N03** Students will be expected to demonstrate an understanding of factors and multiples by<br>▪ determining multiples and factors of numbers less than 100<br>▪ identifying prime and composite numbers<br>▪ solving problems using multiples and factors<br><br>**N09** Students will be expected to explain and apply the order of operations, excluding exponents, with and without technology (limited to whole numbers).<br><br>**N08** Students will be expected to demonstrate an understanding of multiplication and division of decimals (one-digit whole number multipliers and one-digit natural number divisors). | **N01** Students will be expected to determine and explain why a number is divisible by 2, 3, 4, 5, 6, 8, 9 or 10, and why a number cannot be divided by 0.<br><br>**N02** Students will be expected to demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals to solve problems (for more than one-digit divisors or more than two-digit multipliers, the use of technology is expected).<br><br>**N03** Students will be expected to solve problems involving percents from 1% to 100% (limited to whole numbers). | **N01** Students will be expected to demonstrate an understanding of perfect squares and square roots, concretely, pictorially and symbolically (limited to whole numbers).<br><br>**N02** Students will be expected to determine the approximate square root of numbers that are not perfect squares (limited to whole numbers).<br><br>**N03** Students will be expected to demonstrate an understanding of and solve problems involving percents greater than or equal to 0%.<br><br>**N05** Students will be expected to solve problems that involve rates, ratios, and proportional reasoning.<br><br>**N06** Students will be expected to demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially, and symbolically.<br><br>**N07** Students will be expected to demonstrate an understanding of multiplication and division of integers, concretely, pictorially, and symbolically. | **N05** Students will be expected to determine the exact square root of positive rational numbers<br><br>**N06** Students will be expected to determine an approximate square root of positive rational numbers.<br><br>**N01** Students will be expected to demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by<br>▪ representing repeated multiplication, using powers<br>▪ using patterns to show that a power with an exponent of zero is equal to one<br>▪ solving problems involving powers<br><br>**N02** Students will be expected to demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole number exponents:<br>▪ $(a^m)(a^n) = a^{m+n}$<br>▪ $a^m \div a^n = a^{m-n}, m > n$<br>▪ $(a^m)^n = a^{mn}$<br>▪ $(ab)^m = a^m b^m$<br>▪ $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}, b \neq 0.$<br><br>**N03** Students will be expected to demonstrate an understanding of rational numbers by<br>▪ comparing and ordering rational numbers<br>▪ solving problems that involve arithmetic operations on rational numbers<br><br>**N04** Students will be expected to explain and apply the order of operations, including exponents, with and without technology.<br><br>**PR07** Students will be expected to model, record and explain the operations of multiplication and division of polynomial expressions (limited to polynomials of degree less than or equal to 2) by monomials, concretely, pictorially and symbolically. |

# NUMBER PROGRESSION:
# RATIO, PERCENT, AND INTEGERS

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Ratio** | | | | **N11** Students will be expected to demonstrate an understanding of multiplication to 5 × 5 by<br>▪ representing and explaining multiplication using equal grouping and arrays<br>▪ creating and solving problems in context that involves multiplication<br>▪ modelling multiplication using concrete and visual representations and recording the process symbolically<br>▪ relating multiplication to repeated addition<br>▪ relating multiplication to division<br><br>**N13** Students will be expected to demonstrate an understanding of fractions by<br>▪ explaining that a fraction represents a part of a whole<br>▪ describing situations in which fractions are used<br>▪ comparing fractions of the same whole with like | **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.<br><br>**N06** Students will be expected to demonstrate an understanding of multiplication (one-, two-, or three-digit by one-digit numerals) to solve problems by<br>▪ using personal strategies for multiplication, with and without concrete materials<br>▪ using arrays to represent multiplication<br>▪ connecting concrete representations to symbolic representations<br>▪ estimating products<br>▪ applying the distributive property<br><br>**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<br>▪ name and record fractions for the parts of one whole or a set<br>▪ compare and order fractions<br>▪ model and explain that for different wholes, two identical fractions may not represent the same quantity<br>▪ provide examples of where fractions are used | **N05** Students will be expected to demonstrate, with and without concrete materials, an understanding of multiplication (two-digit by two-digit) to solve problems.<br><br>**N07** Students will be expected to demonstrate an understanding of fractions by using concrete, pictorial, and symbolic representations to<br>▪ create sets of equivalent fractions<br>▪ compare and order fractions with like and unlike denominators<br><br>**N09** Students will be expected to relate decimals to fractions and fractions to decimals (to thousandths) | **N05** Students will be expected to demonstrate an understanding of ratio, concretely, pictorially, and symbolically. | **SP04** Students will be expected to express probabilities as ratios, fractions, and percents. | **N04** Students will be expected to demonstrate an understanding of ratio and rate.<br><br>**N05** Students will be expected to solve problems that involve rates, ratios, and proportional reasoning. | |
| **Percent** | | | | | **N09** Students will be expected to describe and represent decimals (tenths and hundredths) concretely, pictorially, and symbolically.<br><br>**N10** Students will be expected to relate decimals to fractions and fractions to decimals (to hundredths). | **N08** Students will be expected to describe and represent decimals (tenths, hundredths, and thousandths) concretely, pictorially, and symbolically.<br><br>**N09** Students will be expected to relate decimals to fractions and fractions to decimals (to thousandths).<br><br>**N10** Students will be expected to compare and order decimals (to thousandths) by using benchmarks, place value, and equivalent decimals. | **N06** Students will be expected to demonstrate an understanding of percent (limited to whole numbers) concretely, pictorially, and symbolically. | **N03** Students will be expected to solve problems involving percents from 1% to 100% (limited to whole numbers).<br><br>**SP04** Students will be expected to express probabilities as ratios, fractions, and percents. | **N03** Students will be expected to demonstrate an understanding of and solve problems involving percents greater than or equal to 0%. | |
| **Integers** | | | | | | | **N07** Students will be expected to demonstrate an understanding of integers contextually, concretely, pictorially, and symbolically. | **N06** Students will be expected to demonstrate an understanding of addition and subtraction of integers, concretely, pictorially, and symbolically. | **N07** Students will be expected to demonstrate an understanding of multiplication and division of integers, concretely, pictorially, and symbolically. | |

# PATTERNS AND RELATIONS PROGRESSION

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Repeating Patterns** | **PR01** Students will be expected to demonstrate an understanding of repeating patterns (two or three elements) by identifying, reproducing, extending, and creating patterns using manipulatives, sounds, and actions. | **PR01** Students will be expected to demonstrate an understanding of repeating patterns (two to four elements) by describing, reproducing, extending, and creating patterns using manipulatives, diagrams, sounds, and actions.<br><br>**PR02** Students will be expected to translate repeating patterns from one representation to another. | **PR01** Students will be expected to demonstrate an understanding of repeating patterns (three to five elements) by describing, extending, comparing, and creating, patterns using manipulatives, diagrams, sounds, and actions. | | | | | | | |
| **Increasing Patterns** | **PR01** Students will be expected to demonstrate an understanding of repeating patterns (two or three elements) by identifying, reproducing, extending, and creating patterns using manipulatives, sounds, and actions. | **PR01** Students will be expected to demonstrate an understanding of repeating patterns (two to four elements) by describing, reproducing, extending, and creating patterns using manipulatives, diagrams, sounds, and actions.<br><br>**PR02** Students will be expected to translate repeating patterns from one representation to another. | **PR02** Students will be expected to demonstrate an understanding of increasing patterns by describing, extending, and creating numerical patterns (numbers to 100) and non-numerical patterns using manipulatives, diagrams, sounds, and actions. | **PR01** Students will be expected to demonstrate an understanding of increasing patterns by describing, extending, comparing, and creating numerical (numbers to 1000) patterns and non-numerical patterns using manipulatives, diagrams, sounds, and actions. | **PR01** Students will be expected to identify and describe patterns found in tables and charts, including a multiplication chart.<br><br>**PR02** Students will be expected to translate among different representations of a pattern (a table, a chart, or concrete materials).<br><br>**PR03** Students will be expected to represent, describe, and extend patterns and relationships, using charts and tables, to solve problems.<br><br>**PR04** Students will be expected to identify and explain mathematical relationships, using charts and diagrams, to solve problems. | **PR01** Students will be expected to determine the pattern rule to make predictions about subsequent terms. | **PR01** Students will be expected to demonstrate an understanding of the relationships within tables of values to solve problems.<br><br>**PR02** Students will be expected to represent and describe patterns and relationships, using graphs and tables. | **PR01** Students will be expected to demonstrate an understanding of oral and written patterns and their equivalent linear relations.<br><br>**PR02** Students will be expected to create a table of values from a linear relation, graph the table of values, and analyze the graph to draw conclusions and solve problems. | **PR01** Students will be expected to graph and analyze two-variable linear relations.<br><br>**PR02** Students will be expected to model and solve problems, concretely, pictorially, and symbolically, where *a*, *b*, and *c* are integers, using linear equations of the form<br>▪ $ax = b$<br>▪ $\frac{x}{a} = b$, $a \neq 0$<br>▪ $ax + b = c$<br>▪ $\frac{x}{a} + b = c \quad a \neq 0$<br>▪ $a(x + b) = c$ | **N01** Students will be expected to demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by<br>▪ representing repeated multiplication, using powers<br>▪ using patterns to show that a power with an exponent of zero is equal to one<br>▪ solving problems involving powers<br><br>**PR01** Students will be expected to generalize a pattern arising from a problem-solving context, using a linear equation, and verify by substitution.<br><br>**PR02** Students will be expected to graph a linear relation, analyze the graph, and interpolate or extrapolate to solve problems. |
| **Decreasing Patterns** | **PR01** Students will be expected to demonstrate an understanding of repeating patterns (two or three elements) by identifying, reproducing, extending, and creating patterns using manipulatives, sounds, and actions. | **PR01** Students will be expected to demonstrate an understanding of repeating patterns (two to four elements) by describing, reproducing, extending, and creating patterns using manipulatives, diagrams, sounds, and actions.<br><br>**PR02** Students will be expected to translate repeating patterns from one representation to another. | **PR01** Students will be expected to demonstrate an understanding of repeating patterns (three to five elements) by describing, extending, comparing, and creating, patterns using manipulatives, diagrams, sounds, and actions.<br><br>**PR02** Students will be expected to demonstrate an understanding of increasing patterns by describing, extending, and creating numerical patterns (numbers to 100) and non-numerical patterns using manipulatives, diagrams, sounds, and actions. | **PR02** Students will be expected to demonstrate an understanding of decreasing patterns by describing, extending, comparing, and creating numerical (numbers to 1000) patterns and non-numerical patterns using manipulatives, diagrams, sounds, and actions. | **PR01** Students will be expected to identify and describe patterns found in tables and charts, including a multiplication chart.<br><br>**PR02** Students will be expected to translate among different representations of a pattern (a table, a chart, or concrete materials).<br><br>**PR03** Students will be expected to represent, describe, and extend patterns and relationships, using charts and tables, to solve problems.<br><br>**PR04** Students will be expected to identify and explain mathematical relationships, using charts and diagrams, to solve problems. | **PR01** Students will be expected to determine the pattern rule to make predictions about subsequent terms | **PR01** Students will be expected to demonstrate an understanding of the relationships within tables of values to solve problems.<br><br>**PR02** Students will be expected to represent and describe patterns and relationships, using graphs and tables. | **PR01** Students will be expected to demonstrate an understanding of oral and written patterns and their equivalent linear relations.<br><br>**PR02** Students will be expected to create a table of values from a linear relation, graph the table of values, and analyze the graph to draw conclusions and solve problems. | **PR01** Students will be expected to graph and analyze two-variable linear relations.<br><br>**PR02** Students will be expected to model and solve problems, concretely, pictorially, and symbolically, where *a*, *b*, and *c* are integers, using linear equations of the form<br>▪ $ax = b$<br>▪ $\frac{x}{a} = b$, $a \neq 0$<br>▪ $ax + b = c$<br>▪ $\frac{x}{a} + b = c \quad a \neq 0$<br>▪ $a(x + b) = c$ | **N01** Students will be expected to demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by<br>▪ representing repeated multiplication, using powers<br>▪ using patterns to show that a power with an exponent of zero is equal to one<br>▪ solving problems involving powers<br><br>**PR01** Students will be expected to generalize a pattern arising from a problem-solving context, using a linear equation, and verify by substitution<br><br>**PR02** Students will be expected to graph a linear relation, analyze the graph, and interpolate or extrapolate to solve problems. |

# PATTERNS AND RELATIONS PROGRESSION (CONTINUED)

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Equality** | **N04** Students will be expected to represent and describe numbers 2 to 10 in two parts, concretely and pictorially.<br><br>**N05** Students will be expected to compare quantities, 1 to 10, using one-to-one correspondence. | **PR03** Students will be expected to describe equality as a balance and inequality as an imbalance, concretely and pictorially (0 to 20).<br>**PR04** Students will be expected to record equalities using the equal symbol. | **PR03** Students will be expected to demonstrate and explain the meaning of equality and inequality by using manipulatives and diagrams (0 to 100).<br><br>**PR04** Students will be expected to record equalities and inequalities symbolically, using the equal symbol or not equal symbol. | **PR03** Students will be expected to solve one-step addition and subtraction equations involving symbols representing an unknown number. | **PR05** Students will be expected to express a given problem as an equation in which a symbol is used to represent an unknown number.<br><br>**PR06** Students will be expected to solve one-step equations involving a symbol to represent an unknown number. | **PR02** Students will be expected to solve problems involving single-variable, one-step equations with whole number coefficients and whole number solutions. | **PR01** Students will be expected to demonstrate an understanding of the relationships within tables of values to solve problems.<br><br>**PR02** Students will be expected to represent and describe patterns and relationships, using graphs and tables.<br><br>**PR03** Students will be expected to represent generalizations arising from number relationships using equations with letter variables.<br><br>**PR04** Students will be expected to demonstrate and explain the meaning of preservation of equality concretely, pictorially, and symbolically. | **PR01** Students will be expected to demonstrate an understanding of oral and written patterns and their equivalent linear relations.<br><br>**PR02** Students will be expected to create a table of values from a linear relation, graph the table of values, and analyze the graph to draw conclusions and solve problems.<br><br>**PR03** Students will be expected to demonstrate an understanding of preservation of equality by<br>▪ modelling preservation of equality, concretely, pictorially, and symbolically<br>▪ applying preservation of equality to solve equations<br><br>**PR04** Students will be expected to explain the difference between an expression and an equation.<br><br>**PR05** Students will be expected to evaluate an expression given the value of the variable(s). | **PR01** Students will be expected to graph and analyze two-variable linear relations.<br><br>**PR02** Students will be expected to model and solve problems, concretely, pictorially, and symbolically, where *a*, *b*, and *c* are integers, using linear equations of the form<br>▪ $ax = b$<br>▪ $\frac{x}{a} = b$, $a \neq 0$<br>▪ $ax + b = c$<br>▪ $\frac{x}{a} + b = c \quad a \neq 0$<br>▪ $a(x + b) = c$ | **N01** Students will be expected to demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by<br>▪ representing repeated multiplication, using powers<br>▪ using patterns to show that a power with an exponent of zero is equal to one<br>▪ solving problems involving powers<br><br>**PR04** Students will be expected to explain and illustrate strategies to solve single variable linear inequalities with rational coefficients within a problem-solving context. |

# PATTERNS AND RELATIONS PROGRESSION (CONTINUED)

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Variables** | **N04** Students will be expected to represent and describe numbers 2 to 10 in two parts, concretely and pictorially.<br><br>**N05** Students will be expected to compare quantities, 1 to 10, using one-to-one correspondence. | **PR03** Students will be expected to describe equality as a balance and inequality as an imbalance, concretely and pictorially (0 to 20).<br><br>**PR04** Students will be expected to record equalities using the equal symbol. | **PR03** Students will be expected to demonstrate and explain the meaning of equality and inequality by using manipulatives and diagrams (0 to 100).<br><br>**PR04** Students will be expected to record equalities and inequalities symbolically, using the equal symbol or not equal symbol. | **PR03** Students will be expected to solve one-step addition and subtraction equations involving symbols representing an unknown number. | **PR05** Students will be expected to express a given problem as an equation in which a symbol is used to represent an unknown number.<br><br>**PR06** Students will be expected to solve one-step equations involving a symbol to represent an unknown number. | **PR02** Students will be expected to solve problems involving single-variable, one-step equations with whole number coefficients and whole number solutions. | **PR01** Students will be expected to demonstrate an understanding of the relationships within tables of values to solve problems.<br><br>**PR02** Students will be expected to represent and describe patterns and relationships, using graphs and tables.<br><br>**PR03** Students will be expected to represent generalizations arising from number relationships using equations with letter variables.<br><br>**PR04** Students will be expected to demonstrate and explain the meaning of preservation of equality concretely, pictorially, and symbolically. | **PR01** Students will be expected to demonstrate an understanding of oral and written patterns and their equivalent linear relations.<br><br>**PR02** Students will be expected to create a table of values from a linear relation, graph the table of values, and analyze the graph to draw conclusions and solve problems.<br><br>**PR03** Students will be expected to demonstrate an understanding of preservation of equality by<br>▪ modelling preservation of equality, concretely, pictorially, and symbolically<br>▪ applying preservation of equality to solve equations<br><br>**PR04** Students will be expected to explain the difference between an expression and an equation.<br><br>**PR05** Students will be expected to evaluate an expression given the value of the variable(s).<br><br>**PR06** Students will be expected to model and solve, concretely, pictorially, and symbolically, problems that can be represented by one-step linear equations of the form x + a = b, where a and b are integers.<br><br>**PR07** Students will be expected to model and solve, concretely, pictorially, and symbolically, where a, b, and c are whole numbers, problems that can be represented by linear equations of the form<br>▪ ax + b = c<br>▪ ax = b<br>▪ $\frac{x}{a} = b,\ a \neq 0$ | **PR01** Students will be expected to graph and analyze two-variable linear relations.<br><br>**PR02** Students will be expected to model and solve problems, concretely, pictorially, and symbolically, where *a*, *b*, and *c* are integers, using linear equations of the form<br>▪ *ax = b*<br>▪ $\frac{x}{a} = b$, $a \neq 0$<br>▪ *ax + b = c*<br>$\frac{x}{a} + b = c \quad a \neq 0$<br>▪ *a(x + b) = c* | **PR01** Students will be expected to generalize a pattern arising from a problem-solving context, using a linear equation, and verify by substitution.<br><br>**PR02** Students will be expected to graph a linear relation, analyze the graph, and interpolate or extrapolate to solve problems.<br><br>**PR03** Students will be expected to model and solve problems, where *a*, *b*, *c*, *d*, *e*, and *f* are rational numbers, using linear equations of the form<br>▪ *ax = b*<br>▪ $\frac{x}{a} = b$, $a \neq 0$<br>▪ *ax + b = c*<br>▪ $\frac{x}{a} + b = c$, $a \neq 0$<br>▪ *ax = b + cx*<br>▪ *a(x + b) = c*<br>▪ *ax + b = cx + d*<br>▪ *a(bx + c) = d(ex + f)*<br>▪ $\frac{a}{x} = b$, $x \neq 0$<br>where *a*, *b*, *c*, *d*, *e* and *f* are rational numbers.<br><br>**PR04** Students will be expected to explain and illustrate strategies to solve single variable linear inequalities with rational coefficients within a problem-solving context.<br><br>**PR05** Students will be expected to demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to 2). |

# MEASUREMENT PROGRESSION

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measurement - Length** | **M01** Students will be expected to use direct comparison to compare two objects based on a single attribute, such as length, mass, volume, and capacity. | **M01** Students will be expected to demonstrate an understanding of measurement as a process of comparing by identifying attributes that can be compared ordering objects making statements of comparison filling, covering, or matching | **M02** Students will be expected to relate the size of a unit of measure to the number of units (limited to non-standard units) used to measure length and mass.<br>**M03** Students will be expected to compare and order objects by length, height, distance around, and mass using non-standard units and make statements of comparison.<br>**M04** Students will be expected to measure length to the nearest non-standard unit by using multiple copies of a unit and using a single copy of a unit (iteration process).<br>**M05** Students will be expected to demonstrate that changing the position of an object does not alter the measurements of its attributes. | **M03** Students will be expected to demonstrate an understanding of measuring length (cm, m) by<br>▪ selecting and justifying referents for the units centimetre or metre (cm, m)<br>▪ modelling and describing the relationship between the units centimetre or metre (cm, m)<br>▪ estimating length using referents<br>▪ measuring and recording length, width, and height<br>**M05** Students will be expected to demonstrate an understanding of perimeter of regular, irregular, and composite shapes by<br>▪ estimating perimeter using referents for centimetre or metre (cm, m)<br>▪ measuring and recording perimeter (cm, m)<br>▪ create different shapes for a given perimeter (cm, m) to demonstrate that many shapes are possible for a perimeter | | **M02** Students will be expected to demonstrate an understanding of measuring length (mm) by<br>• selecting and justifying referents for the unit millimetre (mm)<br>• modelling and describing the relationship between millimetre (mm) and centimetre (cm) units, and between millimetre (mm) and metre (m) units | | | |
| **Measurement – Perimeter** | | | **M03** Students will be expected to compare and order objects by length, height, distance around, and mass using non-standard units and make statements of comparison. | | | **M01** Students will be expected to design and construct different rectangles, given a perimeter or an area or both (whole numbers), and make generalizations. | **M03** Students will be expected to develop and apply a formula for determining the<br>▪ perimeter of polygons<br>▪ area of rectangles<br>▪ volume of right rectangular prisms | | | |
| **Measurement - Mass** | **M01** Students will be expected to use direct comparison to compare two objects based on a single attribute, such as length, mass, volume, and capacity. | | **M02** Students will be expected to relate the size of a unit of measure to the number of units (limited to non-standard units) used to measure length and mass.<br>**M03** Students will be expected to compare and order objects by length, height, distance around, and mass using non-standard units and make statements of comparison.<br>**M05** Students will be expected to demonstrate that changing the position of an object does not alter the measurements of its attributes. | **M04** Students will be expected to demonstrate an understanding of measuring mass (g, kg) by<br>▪ selecting and justifying referents for the units gram and kilogram (g, kg)<br>▪ modelling and describing the relationship between the units gram and kilogram (g, kg)<br>▪ estimating mass using referents<br>▪ measuring and recording mass | | | | | | |
| **Measurement - Volume** | **M01** Students will be expected to use direct comparison to compare two objects based on a single attribute, such as length, mass, volume, and capacity. | **M01** Students will be expected to demonstrate an understanding of measurement as a process of comparing by identifying attributes that can be compared ordering objects making statements of comparison filling, covering, or matching | | | | **M03** Students will be expected to demonstrate an understanding of volume by<br>• selecting and justifying referents for cubic centimetre ($cm^3$) or cubic metre ($m^3$) units<br>• estimating volume using referents for cubic centimetre ($cm^3$) or cubic metre ($m^3$)<br>• measuring and recording volume ($cm^3$ or $m^3$)<br>• constructing rectangular prisms for a given volume | **M03** Students will be expected to develop and apply a formula for determining the<br>▪ perimeter of polygons<br>▪ area of rectangles<br>▪ volume of right rectangular prisms | | **M04** Students will be expected to develop and apply formulas for determining the volume of right rectangular prisms, right triangular prisms, and right cylinders. | |

# MEASUREMENT PROGRESSION (CONTINUED)

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measurement - Capacity** | **M01** Students will be expected to use direct comparison to compare two objects based on a single attribute, such as length, mass, volume, and capacity. | **M01** Students will be expected to demonstrate an understanding of measurement as a process of comparing by identifying attributes that can be compared ordering objects making statements of comparison filling, covering, or matching | | | | **M04** Students will be expected to demonstrate an understanding of capacity by<br>• describing the relationship between millilitre (mL) and litre (L) units<br>• selecting and justifying referents for millilitre (mL) and litre (L) units<br>• estimating capacity using referents for millilitre (mL) and litre (L)<br>• measuring and recording capacity (mL or L) | | | | |
| **Measurement - Area** | | **M01** Students will be expected to demonstrate an understanding of measurement as a process of comparing by identifying attributes that can be compared ordering objects making statements of comparison filling, covering, or matching | | | **M03** Students will be expected to demonstrate an understanding of area of regular and irregular 2-D shapes by<br>▪ recognizing that area is measured in square units<br>▪ selecting and justifying referents for the units square centimetre ($cm^2$) or square metre ($m^2$)<br>▪ estimating area using referents for $cm^2$ or $m^2$<br>▪ determining and recording area ($cm^2$ or $m^2$)<br>▪ 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 | **M01** Students will be expected to design and construct different rectangles, given a perimeter or an area or both (whole numbers), and make generalizations. | **M03** Students will be expected to develop and apply a formula for determining the<br>▪ perimeter of polygons<br>▪ area of rectangles<br>▪ volume of right rectangular prisms | **M02** Students will be expected to develop and apply a formula for determining the area of triangles, parallelograms, and circles. | **M03** Students will be expected to determine the surface area of right rectangular prisms, right triangular prisms, and right cylinders to solve problems. | |
| **Measurement - Time** | | | **M01** Students will be expected to demonstrate an understanding of the calendar and the relationships among days, weeks, months, and years. | **M01** Students will be expected to relate the passage of time to common activities using non-standard and standard units (minutes, hours, days, weeks, months, years).<br><br>**M02** Students will be expected to relate the number of seconds to a minute, the numbers of minutes to an hour, the numbers of hours to a day, and the number of days to a month in a problem-solving context. | **M01** Students will be expected to read and record time using digital and analog clocks, including 24-hour clocks.<br><br>**M02** Students will be expected to read and record calendar dates in a variety of formats. | | | | | |
| **Measurement - Circles** | | | | | | | | **M01** Students will be expected **to** demonstrate an understanding of circles by<br>▪ describing the relationships among radius, diameter, and circumference<br>▪ relating circumference to pi<br>▪ determining the sum of the central angles<br>▪ constructing circles with a given radius or diameter<br>▪ solving problems involving the radii, diameters, and circumferences of circles. | **M01** Students will be expected to develop and apply the Pythagorean theorem to solve problems. | **M01** Students will be expected to solve problems and justify the solution strategy, using the following circle properties:<br>▪ The perpendicular from the centre of a circle to a chord bisects the chord.<br>▪ The measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc.<br>▪ The inscribed angles subtended by the same arc are congruent.<br>▪ A tangent to a circle is perpendicular to the radius at the point of tangency. |
| **Measurement - Triangles** | | | | | | | | | **M01** Students will be expected to develop and apply the Pythagorean theorem to solve problems. | |

# GEOMETRY PROGRESSION

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
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| **3-D Objects** | **G02** Students will be expected to build and describe 3-D objects. | **G02** Students will be expected to replicate composite 2-D shapes and 3-D objects. | **G02** Students will be expected to recognize, name, describe, compare, and build 3-D objects, including cubes and other prisms, spheres, cones, cylinders, and pyramids. | **G01** Students will be expected to describe 3-D objects according to the shape of the faces and the number of edges and vertices. | **G01** Students will be expected to describe and construct rectangular and triangular prisms. | **G01** Students will be expected to describe and provide examples of edges and faces of 3-D objects, and sides of 2-D shapes that are parallel, intersecting, perpendicular, vertical, and horizontal. | **M03** Students will be expected to develop and apply a formula for determining the<br>▪ perimeter of polygons<br>▪ area of rectangles<br>▪ volume of right rectangular prisms | | **M02** Students will be expected to draw and construct nets for 3-D objects.<br>**G01** Students will be expected to draw and interpret top, front, and side views of 3-D objects composed of right rectangular prisms. | **G01** Students will be expected to determine the surface area of composite 3-D objects to solve problems. |
| **2-D Shapes** | | **G03** Students will be expected to identify 2-D shapes in 3-D objects. | **G03** Students will be expected to recognize, name, describe, compare and build 2-Dshapes, including triangles, squares, rectangles, and circles.<br>**G04** Students will be expected to identify 2-D shapes as part of 3-D objects in the environment. | **G02** Students will be expected to name, describe, compare, create, and sort regular and irregular polygons, including triangles, quadrilaterals, pentagons, hexagons, and octagons according to the number of sides.<br>**G01** Students will be expected to describe 3-D objects according to the shape of the faces and the number of edges and vertices. | **G02** Students will be expected to demonstrate an understanding of congruency, concretely and pictorially.<br>**G03** Students will be expected to demonstrate an understanding of line symmetry by<br>• identifying symmetrical 2-D shapes<br>• creating symmetrical 2-D shapes<br>• drawing one or more lines of symmetry in a 2-D shapes | **G01** Students will be expected to describe and provide examples of edges and faces of 3-D objects, and sides of 2-D shapes that are parallel, intersecting, perpendicular, vertical, and horizontal.<br>**G02** Students will be expected to name, identify, and sort quadrilaterals, including rectangles, squares, trapezoids, parallelograms, and rhombi, according to their attributes. | **M03** Students will be expected to develop and apply a formula for determining the<br>▪ perimeter of polygons<br>▪ area of rectangles<br>▪ volume of right rectangular prisms<br>**G01** Students will be expected to construct and compare triangles, including scalene, isosceles, equilateral, right, obtuse, or acute in different orientations.<br>**G02** Students will be expected to describe and compare the sides and angles of regular and irregular polygons. | **G01** Students will be expected to perform geometric constructions, including<br>▪ perpendicular line segments<br>▪ parallel line segments<br>▪ perpendicular bisectors<br>▪ angle bisectors<br>**M02** Students will be expected to develop and apply a formula for determining the area of triangles, parallelograms, and circles. | | **G02** Students will be expected to demonstrate an understanding of similarity of polygons.<br>**G03** Students will be expected to draw and interpret scale diagrams of 2-D shapes.<br>**G04** Students will be expected to demonstrate an understanding of line and rotation symmetry. |
| **Angles** | | | | | | **G05** Students will be expected to identify right angles. | **M01** Students will be expected to demonstrate an understanding of angles by<br>▪ identifying examples of angles in the environment<br>▪ classifying angles according to their measure<br>▪ estimating the measure of angles using 45°, 90°, and 180° as reference angles<br>▪ determining angle measures in degrees<br>▪ drawing and labelling angles when the measure is specified<br>**M02** Students will be expected to demonstrate that the sum of interior angles is 180° in a triangle and 360° in a quadrilateral. | | | **M01** Students will be expected to solve problems and justify the solution strategy, using the following circle properties:<br>▪ The perpendicular from the centre of a circle to a chord bisects the chord.<br>▪ The measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc.<br>▪ The inscribed angles subtended by the same arc are congruent.<br>▪ A tangent to a circle is perpendicular to the radius at the point of tangency. |
| **Sorting 3-D Objects and 2-D Shapes** | **G01** Students will be expected to sort 3-D objects using a single attribute. | **G01** Students will be expected to sort 3-D objects and 2-D shapes using one attribute and explain the sorting rule. | **G01** Students will be expected to sort 2-D shapes and 3-D objects using two attributes and explain the sorting rule. | | | **G02** Students will be expected to name, identify, and sort quadrilaterals, including rectangles, squares, trapezoids, parallelograms, and rhombi, according to their attributes. | | | | |
| **Transformational Geometry** | | | | | | **G03** Students will be expected to perform a single transformation (translation, rotation, or reflection) of a 2-D shape (with and without technology) and draw and describe the image.<br>**G04** Students will be expected to identify and describe a single transformation, including a translation, rotation, and reflection of 2-D shapes. | **G03** Students will be expected to perform a combination of translation(s), rotation(s), and/or reflection(s) on a single 2-D shape, with and without technology, and draw and describe the image.<br>**G04** Students will be expected to perform a combination of successive transformations of 2-D shapes to create a design and identify and describe the transformations.<br>**G05** Students will be expected to identify and plot points in the first quadrant of a Cartesian plane using whole number ordered pairs.<br>**G06** Students will be expected to perform and describe single transformations of a 2-D shape in the first quadrant of a Cartesian plane (limited to whole number vertices). | **G02** Students will be expected to identify and plot points in the four quadrants of a Cartesian plane, using integral ordered pairs.<br>**G03** Students will be expected to perform and describe transformations (translations, rotations, or reflections) of a 2-D shape in all four quadrants of a Cartesian plane (limited to integral number vertices). | **G02** Students will be expected to demonstrate an understanding of the congruence of polygons under a transformation. | |

# STATISTICS AND PROBABILITY PROGRESSION

| TOPIC | MATHEMATICS PRIMARY | MATHEMATICS 1 | MATHEMATICS 2 | MATHEMATICS 3 | MATHEMATICS 4 | MATHEMATICS 5 | MATHEMATICS 6 | MATHEMATICS 7 | MATHEMATICS 8 | MATHEMATICS 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Data Management** | | | **SP02** Students will be expected to construct and interpret concrete graphs and pictographs to solve problems. | **SP01** Students will be expected to collect first-hand data and organize it using tally marks, line plots, charts, and lists to answer questions.<br><br>**SP02** Students will be expected to construct, label, and interpret bar graphs to solve problems. | **SP01** Students will be expected to demonstrate an understanding of many-to-one correspondence.<br><br>**SP02** Students will be expected to construct and interpret pictographs and bar graphs involving many-to-one correspondence to draw conclusions. | **SP01** Students will be expected to differentiate between first-hand and second-hand data.<br><br>**SP02** Students will be expected to construct and interpret double bar graphs to draw conclusions. | **G05** Students will be expected to identify and plot points in the first quadrant of a Cartesian plane using whole number ordered pairs.<br><br>**SP01** Students will be expected to create, label, and interpret line graphs to draw conclusions.<br><br>**SP02** Students will be expected to select, justify, and use appropriate methods of collecting data, including questionnaires, experiments, databases, and electronic media.<br><br>**SP03** Students will be expected to graph collected data and analyze the graph to solve problems. | **G02** Students will be expected to identify and plot points in the four quadrants of a Cartesian plane, using integral ordered pairs.<br><br>**SP03** Students will be expected to construct, label, and interpret circle graphs to solve problems. | **SP01** Students will be expected to critique ways in which data is presented. | **SP01** Students will be expected to describe the effect on the collection of data of bias, use of language, ethics, cost, time and timing, privacy, and cultural sensitivity.<br><br>**SP02** Students will be expected to select and defend the choice of using either a population or a sample of a population to answer a question.<br><br>**SP03** Students will be expected to develop and implement a project plan for the collection, display, and analysis of data by<br>▪ formulating a question for investigation<br>▪ choosing a data collection method that includes social considerations<br>▪ selecting a population or a sample<br>▪ collecting the data<br>▪ displaying the collected data in an appropriate manner<br>▪ drawing conclusions to answer the question |
| **Statistics** | | | | | | | | **SP01** Students will be expected to demonstrate an understanding of central tendency and range by<br>• determining the measures of central tendency (mean, median, mode) and range<br>• determining the most appropriate measures of central tendency to report findings<br><br>**SP02** Students will be expected to determine the effect on the mean, median, and mode when an outlier is included in a data set. | | |
| **Probability** | | | | | | **SP03** Students will be expected to describe the likelihood of a single outcome occurring, using words such as **impossible**, **possible**, and **certain**. | **SP04** Students will be expected to demonstrate an understanding of probability by<br>▪ identifying all possible outcomes of a probability experiment<br>▪ differentiating between experimental and theoretical probability<br>▪ determining the theoretical probability of outcomes in a probability experiment<br>▪ determining the experimental probability of outcomes in a probability experiment<br>▪ comparing experimental results with the theoretical probability for an experiment | **SP04** Students will be expected to express probabilities as ratios, fractions, and percents.<br><br>**SP05** Students will be expected to identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving two independent events.<br><br>**SP06** Students will be expected to conduct a probability experiment to compare the theoretical probability (determined using a tree diagram, table, or other graphic organizer) and experimental probability of two independent events. | **SP02** Students will be expected to solve problems involving the probability of independent events. | **SP04** Students will be expected to demonstrate an understanding of the role of probability in society. |