Mathletics
Ontario Program of Studies
Understanding Practice and Fluency (UPF)

Grades 4 – 6
October, 2021

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Grade 4

1 Number

1.1 Number sense: demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Outcome	Quests	Content
1. Whole numbers: read, represent, compose, and decompose whole numbers up to and including 10 000, using appropriate tools and strategies, and describe various ways they are used in everyday life	Numbers up to 10 000	Reading & writing 4-digit numbers
		Using place value to partition 4-digit numbers
		Identifying place value: 4-digit numbers
2. Whole numbers: compare and order whole numbers up to and including 10 000, in various contexts	Compare & order 4-digit numbers	Comparing & ordering 4-digit numbers
3. Whole numbers: round whole numbers to the nearest ten, hundred, or thousand, in various contexts	Round 4-digit numbers	Rounding 4-digit numbers
4. Fractions and decimals: represent fractions from halves to tenths using drawings, tools, and standard fractional notation, and explain the meanings of the denominator and the numerator	Represent fractions, halves to tenths	Introducing the terms numerator & denominator
		Representing halves, fourths & eighths
		Representing thirds & sixths
		Representing fifths & tenths
5. Fractions and decimals: use drawings and models to represent, compare, and order fractions representing the individual portions that result from two different fair-share scenarios involving any combination of 2, 3, 4, 5, 6, 8, and 10 sharers	Compare & order fractions with models	Comparing & ordering fractions with models
		Comparing fractions, same numerator or denominator
6. Fractions and decimals: count to 10 by halves, thirds, fourths, fifths, sixths, eighths, and tenths, with and without the use of tools	Counting in fractions	Counting up to 10 in halves & fourths
		Counting in thirds on a number line up to 3
		Counting in tenths
		Counting in fractions
7. Fractions and decimals: read, represent, compare, and order decimal tenths, in various contexts	Decimal tenths	Introducing decimal tenths
		Comparing & ordering decimal tenths

8. Fractions and decimals: round decimal numbers to the nearest whole number, in various contexts	Round decimal tenths	Round decimal tenths, nearest whole
9. Fractions and decimals: describe relationships and show equivalences among fractions and decimal tenths, in various contexts	Equivalence, fractions & decimal tenths	Connecting decimal tenths to common fractions

1.2 Operations: use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Outcome	Quests	Content
1. Properties and relationships: use the properties of operations, and the relationships between addition, subtraction, multiplication, and division, to solve problems involving whole numbers, including those requiring more than one operation, and check calculations	Inverse operations & properties	The distributive property
		The commutative property
		The associative property
		Inverse relationships, addition & subtraction
		Inverse relationships, multiplication & division
2. Math facts: recall and demonstrate multiplication facts for 1 × 1 to 10 × 10, and related division facts	Multiplication/division facts, 1–10	Recalling multiplication facts for 2, 5 & 10
		Recalling multiplication facts for 3, 6 & 9
		Recalling multiplication facts for 4 & 8
		Recalling multiplication facts for 7
		Recalling multiplication facts up to 10 × 10
		Recalling the division facts for 2, 5 & 10
		Recalling the division facts for 3, 6 & 9
		Recalling division facts for 4 & 8
		Recalling division facts for 7
3. Mental math: use mental math strategies to multiply whole numbers by 10, 100, and 1000, divide whole numbers by 10, and add and subtract decimal tenths, and explain the strategies used	Mental math: add/subtract decimal tenths	Adding & subtracting tenths, mental strategies
	Multiply & divide by 10, 100, 1000	Multiply/divide whole numbers by 10, 100 & 1000
		Dividing whole numbers by 10
4. Addition and subtraction: represent and solve problems involving the addition and subtraction of whole numbers that	Add & subtract decimal tenths	Adding decimal tenths
		Subtracting decimal tenths
	Add & subtract whole numbers to 10 000	Add numbers up to 5 digits, mental strategies

add up to no more than 10 000 and of decimal tenths, using appropriate tools and strategies, including algorithms		Add numbers up to 4 digits, algorithm
		Subtract numbers up to 5 digits, mental strategies
		Subtract numbers up to 4 digits, algorithm
5. Multiplication and division: represent and solve problems involving the multiplication of two- or three-digit whole numbers by one-digit whole numbers and by 10, 100, and 1000, using appropriate tools, including arrays	Multiply 2-digit & 3-digit numbers	Multiplying by 100
		Multiplication strategies
6. Multiplication and division: represent and solve problems involving the division of two- or three-digit whole numbers by one-digit whole numbers, expressing any remainder as a fraction when appropriate, using appropriate tools, including arrays	Divide 2-digits & 3-digits by 1-digit	Division strategies
		Dividing using place value
		Dividing with remainders
7. Multiplication and division: represent the relationship between the repeated addition of a unit fraction and the multiplication of that unit fraction by a whole number, using tools, drawings, and standard fractional notation	Multiply unit fractions by whole numbers	Multiply unit fractions by whole numbers, models
8. Multiplication and division: show simple multiplicative relationships involving whole-number rates, using various tools and drawings	Solve problems involving rates	Solving problems involving rates

2 Algebra

2.1 Patterns and relationships: identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Outcome	Quests	Content
1. Patterns: identify and describe repeating and growing patterns, including patterns found in real-life contexts	ID/describe repeating & growing patterns	Identifying & describing growing patterns
		Identifying & describing repeating patterns
2. Patterns: create and translate repeating and growing patterns using various representations, including tables of values and graphs	Create repeating & growing patterns	Creating growing patterns
		Creating repeating patterns
3. Patterns: determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating and growing patterns	Pattern rules: repeating & growing	Investigating number patterns
		Finding a rule for a given shape pattern
4. Patterns: create and describe patterns to illustrate relationships among whole numbers and decimal tenths	Patterns: whole numbers & decimal tenths	Patterns: whole numbers & decimal tenths

2.2 Equations and inequalities: demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Outcome	Quests	Content
1. Variables: identify and use symbols as variables in expressions and equations	Teacher directed	Teacher directed
2. Equalities and Inequalities: solve equations that involve whole numbers up to 50 in various contexts, and verify solutions	Solve equations	Solving 1-step equations
3. Equalities and Inequalities: solve inequalities that involve addition and subtraction of whole numbers up to 20, and verify and graph the solutions	Solve inequalities	Solving inequalities

2.3 Coding: solve problems and create computational representations of mathematical situations using coding concepts and skills

Outcome	Quests	Content
1. Coding skills: solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, repeating, and nested events	Teacher directed	Teacher directed
2. Coding skills: read and alter existing code, including code that involves sequential, concurrent, repeating, and nested events, and describe how changes to the code affect the outcomes	Teacher directed	Teacher directed

3 Data

3.1 Data literacy: manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Outcome	Quests	Content
1. Data collection and organization: describe the difference between qualitative and quantitative data, and describe situations where each would be used	Qualitative & quantitative data	Identifying qualitative & quantitative data
2. Data collection and organization: collect data from different primary and secondary sources to answer questions of interest that involve comparing two or more sets of data, and organize the data in frequency tables and stem-and-leaf plots	Collect & compare data	Collecting & recording category data in tables
		Stem-and-leaf plots
3. Data visualization: select from among a variety of graphs, including multiple-bar graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs	Graphs: multiple-bar graphs	Representing data in a multiple-bar graph
		Representing data in a pictograph
4. Data visualization: create an infographic about a data set, representing the data in appropriate ways, including in frequency tables, stem-and-leaf plots, and multiple-bar graphs, and incorporating any other relevant information that helps to tell a story about the data	Teacher directed	Teacher directed
5. Data Analysis: determine the mean and the median and identify the mode(s), if any, for various data sets involving whole numbers, and explain what each of these measures indicates about the data	Mean, median & mode	Understanding & calculating the mean
		Understanding & calculating the median
		Understanding & calculating the mode
6. Data analysis: analyse different sets of data presented in various ways, including in stem-and-leaf plots and multiple-bar graphs, by	Analyse data	Analysing data in stem-and-leaf plots
		Analysing data in multiple-bar graphs

asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions		Analysing data in bar graphs, pictographs & tables

3.2 Probability: describe the likelihood that events will happen, and use that information to make predictions

Outcome	Quests	Content
1. Probability: use mathematical language, including the terms "impossible", "unlikely", "equally likely", "likely", and "certain", to describe the likelihood of events happening, represent this likelihood on a probability line, and use it to make predictions and informed decisions	Probability language	Describe the chances of everyday events occurring
2. Probability: make and test predictions about the likelihood that the mean, median, and mode(s) of a data set will be the same for data collected from different populations	Teacher directed	Teacher directed

4 Spatial Sense

4.1 Geometric and spatial reasoning: describe and represent shape, location, and movement by applying geometric properties and spatial relationships in order to navigate the world around them

Outcome	Quests	Content
1. Geometric reasoning: identify geometric properties of rectangles, including the number of right angles, parallel and perpendicular sides, and lines of symmetry	Teacher directed	Teacher directed
2. Location and movement: plot and read coordinates in the first quadrant of a Cartesian plane, and describe the translations that move a point from one coordinate to another	The Cartesian plane	The Cartesian coordinate system, 1st quadrant
		Investigating translations in the 1st quadrant
3. Location and movement: describe and perform translations and reflections on a grid, and predict the results of these transformations	Translations & reflections	Translations & reflections

4.2 Measurement: compare, estimate, and determine measurements in various contexts

Outcome	Quests	Content
1. The metric system: explain the relationships between grams and kilograms as metric units of mass, and between litres and millilitres as metric units of capacity, and use benchmarks for these units to estimate mass and capacity	Mass & capacity	Introducing units of mass: the gram & kilogram
		Introducing capacity units: millilitres & litres
		Estimating capacities using millilitres & litres
2. The metric system: use metric prefixes to describe the relative size of different metric units, and choose appropriate units and tools to measure length, mass, and capacity	Length, mass, capacity: units & tools	Select & use metric units & tools, mass
		Select & use metric units & tools, capacity
		Select metric units, length
3. Time: solve problems involving elapsed time by applying the relationships between different units of time	Solve problems involving elapsed time	Calculating elapsed time

4. Angles: identify angles and classify them as right, straight, acute, or obtuse	Identify & classify angles	Classifying angles
5. Area: use the row and column structure of an array to measure the areas of rectangles and to show that the area of any rectangle can be found by multiplying its side lengths	Area of rectangles, models	Finding the area of a rectangle, arrays
		Finding the area of a rectangle, area model
6. Area: apply the formula for the area of a rectangle to find the unknown measurement when given two of the three	Area of rectangles, formula	Finding the area of rectangles, formula

5 Financial Literacy

5.1 Money and finances: demonstrate the knowledge and skills needed to make informed financial decisions

Outcome	Quests	Content
1. Money concepts: identify various methods of payment that can be used to purchase goods and services	Teacher directed	Teacher directed
2. Money concepts: estimate and calculate the cost of transactions involving multiple items priced in whole-dollar amounts, not including sales tax, and the amount of change needed when payment is made in cash, using mental math	Calculate the purchase cost & change	Calculating the purchase cost & change
3. Financial management: explain the concepts of spending, saving, earning, investing, and donating, and identify key factors to consider when making basic decisions related to each	Teacher directed	Teacher directed
4. Financial management: explain the relationship between spending and saving, and describe how spending and saving behaviours may differ from one person to another	Teacher directed	Teacher directed
5. Consumer and civic awareness: describe some ways of determining whether something is reasonably priced and therefore a good purchase	Teacher directed	Teacher directed

Grade 5

1 Number

1.1 Number sense: demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Outcome	Quests	Content
1. Whole numbers: read, represent, compose, and decompose whole numbers up to and including 100 000, using appropriate tools and strategies, and describe various ways they are used in everyday life	Numbers up to 100 000	Reading & writing 5-digit numbers
		Identifying place value: 5-digit numbers
		Using place value to partition 5-digit numbers
		Rounding 5-digit numbers
2. Whole numbers: compare and order whole numbers up to and including 100 000, in various contexts	Compare & order 5-digit numbers	Comparing & ordering 5-digit numbers
3. Fractions, decimals, and percents: represent equivalent fractions from halves to twelfths, including improper fractions and mixed numbers, using appropriate tools, in various contexts	Equivalent fractions	Finding equivalent fractions using multiplication
		Finding equivalent fractions using a number line
4. Fractions, decimals, and percents: compare and order fractions from halves to twelfths, including improper fractions and mixed numbers, in various contexts	Compare & order fractions	Comparing & ordering fractions
		Comparing & ordering fractions using models
5. Fractions, decimals, and percents: read, represent, compare, and order decimal numbers up to hundredths, in various contexts	Decimal hundredths	Introducing decimal hundredths
6. Fractions, decimals, and percents: round decimal numbers to the nearest tenth, in various contexts	Round decimal hundredths	Round decimal hundredths, nearest whole & tenth
7. Fractions, decimals, and percents: describe relationships and show equivalences among fractions, decimal numbers up to hundredths, and whole number	Fractions, decimals & percents	Connecting decimals & fractions
		Representing fractions as percents
		Representing percents & decimals

Outcome	Quests	Content
percents, using appropriate tools and drawings, in various contexts		Fraction, decimal & percent equivalence

1.2 Operations: use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Outcome	Quests	Content
1. Properties and relationships: use the properties of operations, and the relationships between operations, to solve problems involving whole numbers and decimal numbers, including those requiring more than one operation, and check calculations	Inverse operations & properties	Using inverse operations to solve problems
2. Math facts: recall and demonstrate multiplication facts from 0 × 0 to 12 × 12, and related division facts	Multiplication & division facts, 0–12	Multiplication properties
		Multiplication facts for 2, 5 & 10
		Multiplication facts for 3, 6 & 9
		Multiplication facts for 4 & 8
		Multiplication facts for 7
		Multiplication facts for 11 & 12
		Division facts for 2, 5 & 10
		Division facts for 3, 6 & 9
		Division facts for 7
		Division facts for 4 & 8
		Division facts for 11 & 12
		Recalling multiplication facts up to 12 × 12
3. Mental math: use mental math strategies to multiply whole numbers by 0.1 and 0.01 and estimate sums and differences of decimal numbers up to hundredths, and explain the strategies used	Mental math strategies, decimals	Adding & subtracting decimals, mental strategies
		Dividing whole numbers by 10
		Multiplying whole numbers by 0.1 & 0.01
4. Addition and subtraction: represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 100 000, and of decimal numbers up to hundredths, using appropriate tools, strategies, and algorithms	Add & subtract whole numbers & decimals	Adding & subtracting 5-digit numbers, algorithm
		Adding & subtracting 5-digit numbers, mentally
		Adding & subtracting decimals to hundredths
5. Addition and subtraction: add and subtract fractions with like denominators, in various contexts	Add/subtract fractions, like denominator	Add fractions with like denominators
		Subtract fractions with like denominators

6. Multiplication and division: represent and solve problems involving the multiplication of two-digit whole numbers by two-digit whole numbers using the area model and using algorithms, and make connections between the two methods	Multiply 2-digit by 2-digit	Multiplying 2-digit numbers by 2-digit numbers
7. Multiplication and division: represent and solve problems involving the division of three-digit whole numbers by two-digit whole numbers using the area model and using algorithms, and make connections between the two methods, while expressing any remainder appropriately	Divide 3-digits by 2-digits	Dividing 2 & 3-digit numbers by 2-digit numbers
8. Multiplication and division: multiply and divide one-digit whole numbers by unit fractions, using appropriate tools and drawings	Multiply & divide unit fractions	Multiplying unit fractions by whole numbers
		Dividing unit fractions by whole numbers
9. Multiplication and division: represent and create equivalent ratios and rates, using a variety of tools and models, in various contexts	Equivalent ratios & rates	Equivalent ratios & rates

2 Algebra

2.1 Patterns and relationships: identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Outcome	Quests	Content
1. Patterns: identify and describe repeating, growing, and shrinking patterns, including patterns found in real-life contexts	Identify & describe patterns	Identify/create growing & shrinking patterns
2. Patterns: create and translate growing and shrinking patterns using various representations, including tables of values and graphs	Create growing & shrinking patterns	Creating growing & shrinking patterns
3. Patterns: determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns	Determine rules & extend patterns	Extending repeating, growing & shrinking patterns
		Determining & using pattern rules

2.2 Equations and inequalities: demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Outcome	Quests	Content
1. Variables and expressions: translate among words, algebraic expressions, and visual representations that describe equivalent relationships	Translate algebraic expressions	Translate among words & algebraic expressions
2. Variables and expressions: evaluate algebraic expressions that involve whole numbers	Evaluate algebraic expressions	Evaluating algebraic expressions
3. Equalities and inequalities: solve equations that involve whole numbers up to 100 in various contexts, and verify solutions	Solve equations, numbers up to 100	Solving equations
		Solving equations using models
4. Equalities and inequalities: solve inequalities that involve one operation and whole numbers up to 50, and verify and graph the solutions	Solve inequalities	Solving inequalities

2.3 Coding: solve problems and create computational representations of mathematical situations using coding concepts and skills

Outcome	Quests	Content
1. Coding skills: solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves conditional statements and other control structures	Teacher directed	Teacher directed
2. Coding skills: read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes	Teacher directed	Teacher directed

3 Data

3.1 Data literacy: manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Outcome	Quests	Content
1. Data collection and organization: explain the importance of various sampling techniques for collecting a sample of data that is representative of a population	Teacher directed	Teacher directed
2. Data collection and organization: collect data, using appropriate sampling techniques as needed, to answer questions of interest about a population, and organize the data in relative-frequency tables	Relative-frequency tables	Finding the relative frequency in a table
3. Data visualization: select from among a variety of graphs, including stacked-bar graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs	Data displays	Understanding stacked-bar graphs
		Graphing relative frequency
5. Data analysis: determine the mean and the median and identify the mode(s), if any, for various data sets involving whole numbers and decimal numbers, and explain what each of these measures indicates about the data	Measures of central tendency	Understanding & calculating the mean
		Understanding & calculating the median
		Understanding & calculating the mode
6. Data analysis: analyse different sets of data presented in various ways, including in stacked-bar graphs and in misleading graphs, by asking and answering questions about the data, challenging preconceived notions, and drawing conclusions, then make convincing arguments and informed decisions	Analyse data displays	Interpreting stacked-bar graphs
		Interpreting bar graphs
		Interpreting data in tables
		Interpreting line plots

3.2 Probability: describe the likelihood that events will happen, and use that information to make predictions

Outcome	Quests	Content
1. Probability: use fractions to express the probability of events happening, represent this probability on a probability line, and use it to make predictions and informed decisions	Express probability with fractions	Expressing probability on a probability line
		Expressing probability with fractions
2. Probability: determine and compare the theoretical and experimental probabilities of an event happening	Theoretical & experimental probability	Comparing theoretical & experimental probability

4 Spatial Sense

4.1 Geometric and spatial reasoning: describe and represent shape, location, and movement by applying geometric properties and spatial relationships in order to navigate the world around them

Outcome	Quests	Content
1. Geometric reasoning: identify geometric properties of triangles, and construct different types of triangles when given side or angle measurements	Classify triangles	Classifying triangles
2. Geometric reasoning: identify and construct congruent triangles, rectangles, and parallelograms	Identify congruent shapes	Identifying congruent shapes
3. Geometric reasoning: draw top, front, and side views of objects, and match drawings with objects	Top, front & side views of objects	Matching drawings with objects
		Top, front & side views of objects
4. Location and movement: plot and read coordinates in the first quadrant of a Cartesian plane using various scales, and describe the translations that move a point from one coordinate to another	The Cartesian plane, 1st quadrant	The Cartesian plane, 1st quadrant
		Investigating translations in the 1st quadrant
5. Location and movement: describe and perform translations, reflections, and rotations up to 180° on a grid, and predict the results of these transformations	Translations, reflections & rotations	Translations, reflections & rotations

4.2 Measurement: compare, estimate, and determine measurements in various contexts

Outcome	Quests	Content
1. The metric system: use appropriate metric units to estimate and measure length, area, mass, and capacity	Measure in metric units	Measuring length using metric units
		Measuring mass using metric units
2. The metric system: solve problems that involve converting larger metric units into smaller	Convert metric units	Converting metric units of length
		Converting metric units of mass

ones, and describe the base ten relationships among metric units		Converting metric units of capacity
3. Angles: compare angles and determine their relative size by matching them and by measuring them using appropriate non-standard units	Compare angles	Comparing angles
4. Angles: explain how protractors work, use them to measure and construct angles up to 180°, and use benchmark angles to estimate the size of other angles	Teacher directed	Teacher directed
5. Area: use the area relationships among rectangles, parallelograms, and triangles to develop the formulas for the area of a parallelogram and the area of a triangle, and solve related problems	Area: parallelograms & triangles	Finding the area of a triangle
		Finding the area of a parallelogram
6. Area: show that two-dimensional shapes with the same area can have different perimeters, and solve related problems	Area & perimeter relationships	Comparing area & perimeter of rectangles
		Solving perimeter & area problems

5 Financial Literacy

5.1 Money and finances: demonstrate the knowledge and skills needed to make informed financial decisions

Outcome	Quests	Content
1. Money concepts: describe several ways money can be transferred among individuals, organizations, and businesses	Teacher directed	Teacher directed
2. Money concepts: estimate and calculate the cost of transactions involving multiple items priced in dollars and cents, including sales tax, using various strategies	Money problems, dollars & cents	Solving money problems
3. Financial management: design sample basic budgets to manage finances for various earning and spending scenarios	Teacher directed	Teacher directed
4. Financial management: explain the concepts of credit and debt, and describe how financial decisions may be impacted by each	Teacher directed	Teacher directed
5. Consumer and civic awareness: calculate unit rates for various goods and services, and identify which rates offer the best value	Unit rate & best value	Calculating unit rate to determine the best value
6. Consumer and civic awareness: describe the types of taxes that are collected by the different levels of government in Canada, and explain how tax revenue is used to provide services in the community	Teacher directed	Teacher directed

Grade 6

1 Number

1.1 Number sense: demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Outcome	Quests	Content
1. Rational numbers: read and represent whole numbers up to and including one million, using appropriate tools and strategies, and describe various ways they are used in everyday life	Numbers to one million	Reading & writing 6-digit numbers
		Identifying place value: 6-digit numbers
		Using place value to partition 6-digit numbers
2. Rational numbers: read and represent integers, using a variety of tools and strategies, including horizontal and vertical number lines	Read & represent integers	Investigating integers
3. Rational numbers: compare and order integers, decimal numbers, and fractions, separately and in combination, in various contexts	Compare/order: integer/decimal/fraction	Comparing & ordering integers
		Comparing & ordering fractions & mixed numbers
		Ordering fractions & decimals
4. Fractions, decimals, and percents: read, represent, compare, and order decimal numbers up to thousandths, in various contexts	Decimals up to thousandths	Decimals up to thousandths
5. Fractions, decimals, and percents: round decimal numbers, both terminating and repeating, to the nearest tenth, hundredth, or whole number, as applicable, in various contexts	Round decimals: tenth, hundredth, whole	Rounding decimals: tenth, hundredth, whole
6. Fractions, decimals, and percents: describe relationships and show equivalences among fractions and decimal numbers up to thousandths, using appropriate tools and drawings, in various contexts	Relate fractions & decimals, thousandths	Relating fractions & decimals up to thousandths

1.2 Operations: use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Outcome	Quests	Content
1. Properties and relationships: use the properties of operations, and the relationships between operations, to solve problems involving whole numbers, decimal numbers, fractions, ratios, rates, and whole number percents, including those requiring multiple steps or multiple operations	Properties & inverse operations	Using inverse operations, whole numbers
		The commutative property
		The associative property
		The distributive property
2. Math facts: understand the divisibility rules and use them to determine whether numbers are divisible by 2, 3, 4, 5, 6, 8, 9, and 10	Divisibility rules	Divisibility rules for dividing by 2
		Divisibility rules for dividing by 3
		Divisibility rules for dividing by 4
		Divisibility rules for dividing by 5
		Divisibility rules for dividing by 6
		Divisibility rules for dividing by 8
		Divisibility rules for dividing by 9
		Divisibility rules for dividing by 10
		Divisibility rules: dividing by 2, 3, 4, 5, 6, 10
3. Mental math: use mental math strategies to calculate percents of whole numbers, including 1%, 5%, 10%, 15%, 25%, and 50%, and explain the strategies used	Calculate percents of whole numbers	Calculating simple percentages
4. Addition and subtraction: represent and solve problems involving the addition and subtraction of whole numbers and decimal numbers, using estimation and algorithms	Add & subtract whole numbers & decimals	Adding whole numbers & decimals
		Subtracting whole numbers & decimals
5. Addition and subtraction: add and subtract fractions with like and unlike denominators, using appropriate tools, in various contexts	Add fractions	Adding fractions, like denominator
		Adding a whole number & a fraction
		Adding fractions, unlike denominator

	Subtract fractions	Subtracting fractions, like denominator
		Subtracting a fraction from a whole number
		Subtracting fractions, unlike denominator
6. Multiplication and division: represent composite numbers as a product of their prime factors, including through the use of factor trees	Prime & composite numbers	Introducing prime & composite numbers
	Prime factors	Using prime factors
7. Multiplication and division: represent and solve problems involving the multiplication of three-digit whole numbers by decimal tenths, using algorithms	Multiply whole numbers by tenths	Multiplying 3-digit whole numbers by tenths
8. Multiplication and division: represent and solve problems involving the division of three-digit whole numbers by decimal tenths, using appropriate tools, strategies, and algorithms, and expressing remainders as appropriate	Divide whole numbers by tenths	Dividing 3-digit whole numbers by tenths
9. Multiplication and division: multiply whole numbers by proper fractions, using appropriate tools and strategies	Multiply whole numbers & fractions	Multiplying whole numbers & proper fractions
10. Multiplication and division: divide whole numbers by proper fractions, using appropriate tools and strategies	Divide whole numbers by fractions	Dividing whole numbers by proper fractions
11. Multiplication and division: represent and solve problems involving the division of decimal numbers up to thousandths by whole numbers up to 10, using appropriate tools and strategies	Divide decimals by whole numbers	Dividing decimals to thousandths by whole numbers
12. Multiplication and division: solve problems involving ratios, including percents and rates, using appropriate tools and strategies	Solve problems involving ratios	Solving problems with unit rates
		Solving ratio problems
		Expressing simple ratios as percents
		Dividing a quantity into a given ratio
		Simplifying & comparing rates
		Solving rate problems

1.3 Patterns and relationships: identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Outcome	Quests	Content
1. Patterns: identify and describe repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and specify which growing patterns are linear	Identify linear growing patterns	Identifying linear growing patterns
2. Patterns: create and translate repeating, growing, and shrinking patterns using various representations, including tables of values, graphs, and, for linear growing patterns, algebraic expressions and equations	Create patterns	Representing linear growing patterns
		Creating tables of values for linear relations
		Matching graphs & linear relations
3. Patterns: determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns, and use algebraic representations of the pattern rules to solve for unknown values in linear growing patterns	Linear pattern rules	Linear pattern rules
4. Patterns: create and describe patterns to illustrate relationships among whole numbers and decimal numbers	Patterns with decimals	Multiplying decimals by 10, 100, 1000
		Dividing decimals by 10, 100, 1000

1.4 Equations and inequalities: demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Outcome	Quests	Content
1. Variables and expressions: add monomials with a degree of 1 that involve whole numbers, using tools	Add monomials	Adding monomials
2. Variables and expressions: evaluate algebraic expressions that involve whole numbers and decimal tenths	Evaluate algebraic expressions	Evaluating algebraic expressions
3. Equalities and inequalities: solve equations that involve multiple	Linear equations, whole numbers	Solving 1-step & 2-step equations

		Solving 1-step & 2-step equations, algebra tiles
terms and whole numbers in various contexts, and verify solutions		
		Modelling real-life scenarios using equations
4. Equalities and inequalities: solve inequalities that involve two operations and whole numbers up to 100, and verify and graph the solutions	Solve inequalities	Solving inequalities

1.5 Coding: solve problems and create computational representations of mathematical situations using coding concepts and skills

Outcome	Quests	Content
1. Coding skills: solve problems and create computational representations of mathematical situations by writing and executing efficient code, including code that involves conditional statements and other control structures	Teacher directed	Teacher directed
2. Coding skills: read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes and the efficiency of the code	Teacher directed	Teacher directed

2 Data

2.1 Data literacy: manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Outcome	Quests	Content
2. Data collection and organization: collect qualitative data and discrete and continuous quantitative data to answer questions of interest about a population, and organize the sets of data as appropriate, including using intervals	Statistical investigations	Conducting a statistical investigation
3. Data visualization: select from among a variety of graphs, including histograms and broken-line graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs	Construct graphs	Constructing broken-line graphs
		Constructing histograms
		Selecting appropriate data displays
4. Create an infographic about a data set, representing the data in appropriate ways, including in tables, histograms, and broken-line graphs, and incorporating any other relevant information that helps to tell a story about the data	Teacher directed	Teacher directed
5. Data analysis: determine the range as a measure of spread and the measures of central tendency for various data sets, and use this information to compare two or more data sets	Measures of central tendency & spread	Measure of spread: range
		Comparing measures of central tendency & spread
		Recognising appropriate statistical measures
		Understand measures of central tendency & spread
6. Data analysis: analyse different sets of data presented in various ways, including in histograms and broken-line graphs and in misleading graphs, by asking and answering questions about the data, challenging preconceived notions, and drawing conclusions, then make convincing arguments and informed decisions	Analyse histograms & broken-line graphs	Evaluating graphs for misleading information
		Reading & interpreting data in a histogram
		Interpreting data in a broken-line graph

2.2 Probability: describe the likelihood that events will happen, and use that information to make predictions

Outcome	Quests	Content
1. Probability: use fractions, decimals, and percents to express the probability of events happening, represent this probability on a probability line, and use it to make predictions and informed decisions	Probability: fractions/decimals/percents	Probability: fractions, decimals & percents
2. Probability: determine and compare the theoretical and experimental probabilities of two independent events happening	Probability: two independent events	Identifying the sample space: 2 independent events
		Understanding independent events
		Interpreting & constructing tree diagrams

3 Spatial Sense

3.1 Geometric and spatial reasoning: describe and represent shape, location, and movement by applying geometric properties and spatial relationships in order to navigate the world around them

Outcome	Quests	Content
1. Geometric reasoning: create lists of the geometric properties of various types of quadrilaterals, including the properties of the diagonals, rotational symmetry, and line symmetry	Properties of quadrilaterals	Classifying quadrilaterals
		Investigating diagonals of special quadrilaterals
		Line & rotational symmetry
2. Geometric reasoning: construct three-dimensional objects when given their top, front, and side views	Teacher directed	Teacher directed
3. Location and movement: plot and read coordinates in all four quadrants of a Cartesian plane, and describe the translations that move a point from one coordinate to another	The Cartesian plane, 4 quadrants	Plotting & reading coordinates in all 4 quadrants
		Translations of points on the Cartesian plane
4. Location and movement: describe and perform combinations of translations, reflections, and rotations up to 360° on a grid, and predict the results of these transformations	Combinations of transformations	Identifying combinations of transformations

3.2 Measurement: compare, estimate, and determine measurements in various contexts

Outcome	Quests	Content
1. The metric system: measure length, area, mass, and capacity using the appropriate metric units, and solve problems that require converting smaller units to larger ones and vice versa	Convert metric units	Converting metric units of length
		Converting metric units of mass
		Converting metric units of capacity
2. Angles: use a protractor to measure and construct angles up to 360°, and state the relationship between angles that are measured	Measure angles	Measuring angles up to 360°

clockwise and those that are measured counter clockwise		
3. Angles: use the properties of supplementary angles, complementary angles, opposite angles, and interior and exterior angles to solve for unknown angle measures	Solve for unknown angle measures	Supplementary angles
		Complementary angles
		Opposite angles
		Interior & exterior angles of a triangle
4. Area and surface area: determine the areas of trapezoids, rhombuses, kites, and composite polygons by decomposing them into shapes with known areas	Area: quadrilaterals, composite polygons	Finding the area of a trapezoid
		Finding the area of a rhombus
		Finding the area of a kite
		Finding the area of composite shapes
5. Area and surface area: create and use nets to demonstrate the relationship between the faces of prisms and pyramids and their surface areas	Nets: prisms & pyramids	Connecting prisms & pyramids with their nets
6. Area and surface area: determine the surface areas of prisms and pyramids by calculating the areas of their two-dimensional faces and adding them together	Surface area: prisms & pyramids	Finding the surface area of prisms
		Finding the surface area of pyramids

4 Financial Literacy

4.1 Money and finances: demonstrate the knowledge and skills needed to make informed financial decisions

Outcome	Quests	Content
1. Money concepts: describe the advantages and disadvantages of various methods of payment that can be used to purchase goods and services	Teacher directed	Teacher directed
2. Financial management: identify different types of financial goals, including earning and saving goals, and outline some key steps in achieving them	Teacher directed	Teacher directed
3. Financial management: identify and describe various factors that may help or interfere with reaching financial goals	Teacher directed	Teacher directed
4. Consumer and civic awareness: explain the concept of interest rates, and identify types of interest rates and fees associated with different accounts and loans offered by various banks and other financial institutions	Teacher directed	Teacher directed
5. Consumer and civic awareness: describe trading, lending, borrowing, and donating as different ways to distribute financial and other resources among individuals and organizations	Teacher directed	Teacher directed

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