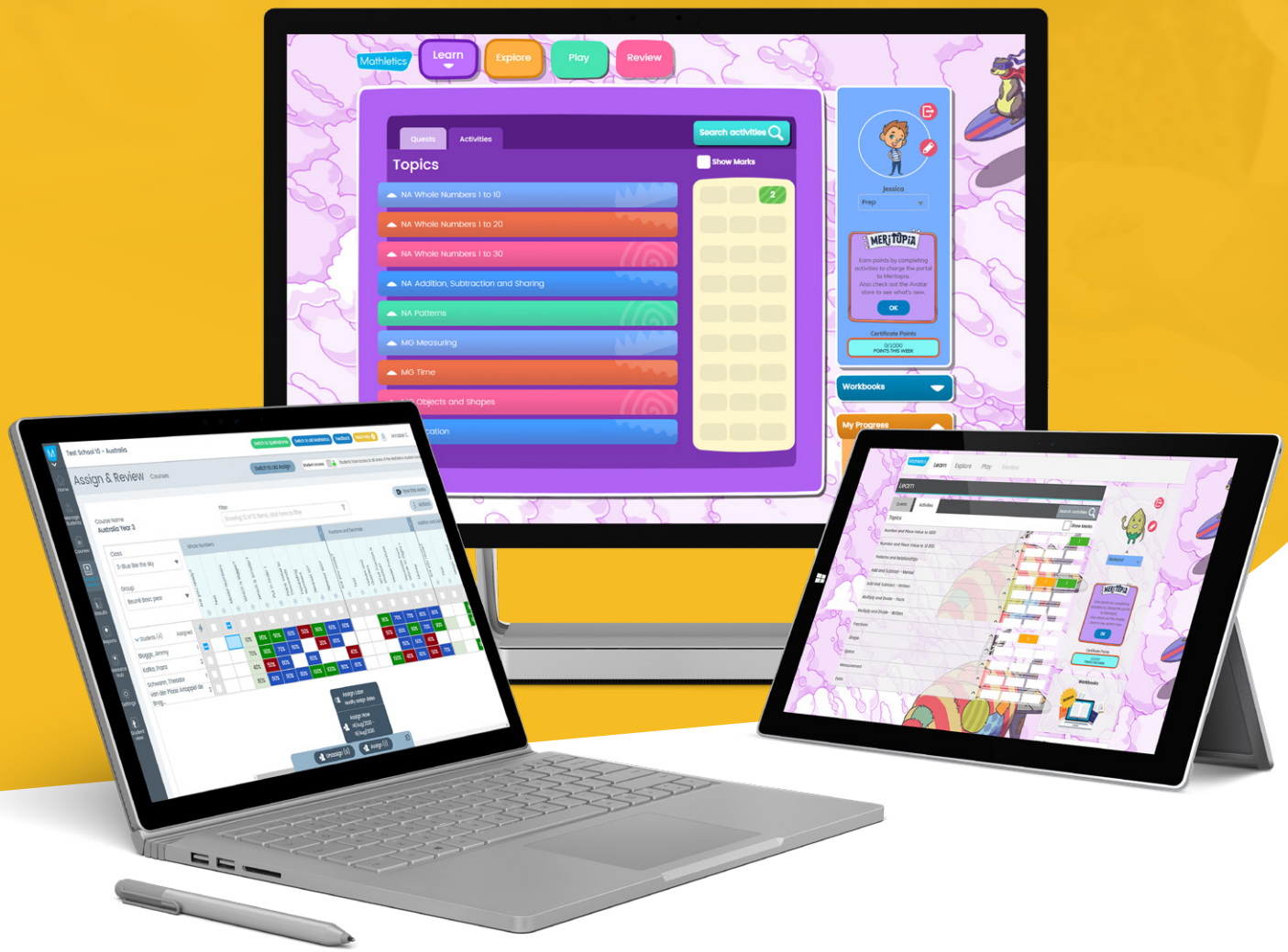
Mathletics
Ontario Curriculum
Understanding Practice and Fluency (UPF)



Grades 1 – 8

Mathletics

Ontario Curriculum Grades 1 – 8

Understanding Practice and Fluency (UPF)

Content

Thank you for using Mathletics.

We look forward to sharing the love of learning with your school.

Ontario Curriculum Grades 1

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.1 read and represent whole numbers up to and including 50, and describe various ways they are used in everyday life				
Read and represent whole numbers to 50	Connect number names, numerals & collections to 50	1	Connecting number names, numerals and collections 0 to 50 (focus on 21 to 50)	• represent numbers 0 to 50 using fingers, pictures, objects, numerals and words • match the collection to the numeral and number word or given a numeral or number word, create the collection
Whole Numbers B1.2 compose and decompose whole numbers up to and including 50, using a variety of tools and strategies, in various contexts				
Compose and decompose numbers to 50	Partitioning 2-digit numbers to 50	1	Using place value to partition 2-digit numbers up to 50	• use place value equipment and models, eg tens frames, to partition a given 2-digit number (up to 50) into tens and ones
	Non-standard partitioning: 2-digit numbers to 50	1	Partitioning 2-digit numbers up to 50 using non-standard partitioning	• use place value equipment and models, eg tens frames, to partition a given 2-digit number (up to 50) using non-standard partitioning, eg 35 as 2 tens and 15 ones
Whole Numbers B1.3 compare and order whole numbers up to and including 50, in various contexts				
Compare and order whole numbers to 50	Comparing collections and numerals to 50	1	Comparing collections and numerals 0 to 50: more than, less than, the same as (focus on 21 to 50)	• apply counting strategies to solve simple everyday problems and justify answers, eg 'who has more?' • compare numerals 0 to 50 and describe as 'more than', 'less than' or 'the same as'
	Ordering collections and numerals to 50	1	Ordering collections and numbers 0 to 50 (focus on 21 to 50)	• count and label collections with numbers 0 to 50;- order from smallest to largest or largest to smallest • order numbers 0 to 50 from smallest to largest or largest to smallest (not necessarily consecutive numbers)
Whole Numbers B1.4 estimate the number of objects in collections of up to 50, and verify their estimates by counting				
Whole Numbers B1.5 count to 50 by 1s, 2s, 5s, and 10s, using a variety of tools and strategies				
Count to 50	Counting by 1s to 50, forward and backward	1	Counting forward by 1s to 50	• count forward by 1s from any number up to 50
		2	Counting backward by 1s to 50	• count backward by 1s from any number up to 50

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B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.5 count to 50 by 1s, 2s, 5s, and 10s, using a variety of tools and strategies				
Count to 50	Counting by 2s to 50, forward and backward	1	Counting by skip counting forward by 2s from any number up to 50	• use concrete materials, models, drawings, number lines/ charts to skip count forward by 2s from any number • skip count by 2s forward by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		2	Counting by skip counting backward by 2s from any number up to 50	• use concrete materials, models, drawings, number lines/ charts to skip count backward from any number up to 50 • skip count by 2s backward by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		3	Counting by skip counting forward or backward by 2s from any number up to 50	• use concrete materials, models, drawings, number lines/ charts to skip count forward or backward by 2s from any number up to 50 • skip count by 2s forward and backward by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
	Counting by 5s to 50, forward and backward	1	Counting by skip counting forward by 5s from any number up to 50	• use concrete materials, models, drawings, number lines/ charts to skip count forward by 5s from any number • skip count by 5s forward by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		2	Counting by skip counting backward in 5s from any number up to 50	• use concrete materials, models, drawings, number lines/ charts to skip count backwards from any number up to 50 • skip count by 5s backwards by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		3	Counting by skip counting forward or backward by 5s from any number up to 50	• use concrete materials, models, drawings, number lines/ charts to skip count forward or backward by 5s from any number up to 50 • skip count by 5s forward and backward by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
	Counting by 10s to 50, forward and backward	1	Counting by skip counting forward by 10s from zero up to 50	• use concrete materials, models, drawings, number lines/ charts to skip count by 10s from zero • use rhythmic counting to count in 10s from zero
		2	Counting by skip counting backward by 10s from numbers up to 50	• use concrete materials, models, drawings, number lines/ charts to skip count backward by 10s • use rhythmic counting to count in 10s from zero
		3	Counting by skip counting forward or backward by 10s from zero up to 50	• use concrete materials, models, drawings, number lines/ charts to skip count forward and backward by 10s from zero • use rhythmic counting to count in 10s forward and backward

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B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.5 count to 50 by 1s, 2s, 5s, and 10s, using a variety of tools and strategies				
Count to 50	Counting by 2s, 5s, 10s to 50	1	Counting by skip counting by 2s, 5s, 10s from zero to 50	• use concrete materials, models, drawings, number lines/ charts to skip count by 2s, 5s, 10s from zero • use rhythmic counting to count by 2s, 5s or 10s from zero
Fractions B1.6 use drawings to represent and solve fair-share problems that involve 2 and 4 sharers, respectively, and have remainders of 1 or 2				
Fair-share problems, 2 and 4 sharers	Solving fair-share problems, 2 and 4 sharers	1	Solving fair-share problems that involve 2 sharers and have remainders of 1 or 2 (no symbols)	• solve fair-share problems that involve 2 sharers using models • solve fair-share problems that involve 2 sharers and have remainders of 1 or 2 using models
		2	Solving fair-share problems that involve 4 sharers and have remainders of 1 or 2 (no symbols)	• solve fair-share problems that involve 4 sharers using models • solve fair-share problems that involve 4 sharers and have remainders of 1 or 2 using models
Fractions B1.7 recognize that one half and two fourths of the same whole are equal, in fair-sharing contexts				
Equivalence, one half and two fourths	Introducing the concept of half	1	Introducing the concept of half (no symbols)	• introduce equal sharing — informal language and related to fairness
Fractions B1.8 use drawings to compare and order unit fractions representing the individual portions that result when a whole is shared by different numbers of sharers, up to a maximum of 10				
Compare and order unit fractions	Comparing and ordering unit fractions with models	1	Comparing and ordering unit fractions with models (denominators to 10)	• compare unit fractions with models (denominators to 10) • order unit fractions with models (denominators to 10)

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B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Properties and Relationships B2.1 use the properties of addition and subtraction, and the relationship between addition and subtraction, to solve problems and check calculations				
Add/subtract properties & relationship	Introducing the commutative property of addition	1	Introducing the commutative property of addition	• represent and solve an addition problem both ways using concrete materials and models eg 5 + 4 or 4 + 5 • swap an addition problem around so the larger number comes first and add by counting on (within 20) • determine, through investigation, that the order in which numbers are subtracted may affect the difference
	Fact families: addition/ subtraction, within 30	1	Finding fact families for addition and subtraction (within 30)	• model and investigate the relationship between addition and subtraction using concrete models and or a number line • find the other three facts given one fact, eg 12 + 5 = 17
Math Facts B2.2 recall and demonstrate addition facts for numbers up to 10, and related subtraction facts				
Addition/ subtraction facts to 10	Recognizing and recalling bonds to 10	1	Recognizing and recalling bonds to 10	• recognize pairs of numbers that add to 10 • find the missing number to add to 10 given one number • recall and record the bonds that add to 10
	Adding and subtracting within 10 fluently	1	Adding and subtracting within 10 fluently	• recall addition and subtraction facts within 10
	Modelling and recording combinations to 5	1	Modelling and recording combinations that add up to 5	• model and record with numerals, the patterns of numbers that add to 5 • find the missing number to add to 5 when one number is given • describe any combination using words such as five is one more than four, or three combined with two makes five
	Modelling and recording combinations to 6	1	Modelling and recording combinations that add up to 6	• model and record with numerals, the patterns of numbers that add to 6 • find the missing number to add to 6 when one number is given • describe any combination using words such as double three makes six
	Modelling and recording combinations to 7	1	Modelling and recording combinations that add up to 7	• model and record with numbers the patterns of numbers that add to 7 • find the missing number to add to 7 when one number is given • describe any combination using words such as four combined with three makes seven
	Modelling and recording combinations to 8	1	Modelling and recording combinations that add up to 8	• model and record the patterns of numbers that add to 8 • find the missing number to add to 8 when one number is given • describe any combination using words such as double four makes eight
	Modelling and recording combinations to 9	1	Modelling and recording combinations that add up to 9	• model and record the patterns of numbers that add to 9 • find the missing number to add to 9 when one number is given • describe any combination using words such as nine is one more than eight

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B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Mental Math **B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 20, and explain the strategies used**				
Mental math: add/subtract to 20	Mental strategies: addition and subtraction to 18	1	Describing and using mental strategies for basic addition and related subtraction facts to 18	• describe and use mental strategies to solve addition and subtraction facts to 18
Addition and Subtraction **B2.4 use objects, diagrams, and equations to represent, describe, and solve situations involving addition and subtraction of whole numbers that add up to no more than 50**				
Add and subtract to 50	Bridging to ten to add, models	1	Bridging to ten to add a 1-digit and 1-digit number using models and diagrams	• add to the nearest ten first then add the rest, using models for support, e.g., 8 + 7 as 8 + 2 = 10 and 10 + 5 = 15 • recognize the best time to use this strategy is when one number is close to a ten • record the strategy of bridging to ten using numbers and/or models, eg, number lines
		2	Bridging to ten to add a 2-digit and 1-digit number using models and diagrams	• add to the nearest ten first then add the rest, using models for support, e.g., 28 + 7 as 28 + 2 = 30 and 30 + 5 = 35 • recognize the best time to use this strategy is when one number is close to a ten • record the strategy of bridging to ten using numbers and/or models, eg number lines
	Adding doubles or near doubles	1	Adding doubles or near doubles	• solve addition problems using doubles, eg 4 + 3 + 4 as 4 + 4 + 3 • model and solve addition problems with near doubles, eg 5 + 7 as 5 + 5 + 2 = 12
	Adding using compatible numbers	1	Adding using compatible numbers and manipulatives for support	• combine numbers that add to 10 eg 4 + 7 + 8 + 6 + 3, first combine 4 and 6, and 7 and 3, then add 8 • find compatible numbers (bonds to 10 or doubles) to add a list of 1-digit numbers, eg 6 + 3 + 4 + 3
	Adding 2-digit and 1-digit numbers, place value	1	Adding 2-digit and 1-digit numbers using place value partitioning with models (split strategy)	• model and solve the addition of a 2-digit and 1-digit number using place value equipment, eg use base 10 blocks to show 25 + 8 as 20 + 5 + 8 and then 20 + 13 = 33 • record and explain the use of the strategy
	Bridging to ten to subtract, models	1	Bridging to ten to subtract a 1-digit number from a 2-digit number using models and diagrams	• subtract to the nearest ten first then subtract the rest, using models for support, e.g., 32 - 6 as 32 - 2 = 30 and 30 - 4 = 26 • recognize the best time to use this strategy is when one number is close to a ten • record the strategy of bridging to ten using numbers and/or models eg number lines

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B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.4 use objects, diagrams, and equations to represent, describe, and solve situations involving addition and subtraction of whole numbers that add up to no more than 50**				
Add and subtract to 50	Subtracting using doubles	1	Subtracting using doubles	• model and solve subtraction problems using doubles, eg 14 - 7 as 7 + 7 = 14 or 15 - 8 as 7 + 7 + 1 = 15
	Addition and subtraction word problems within 20	1	Creating and solving simple addition and subtraction word problems in context (within 20)	• represent a word problem as an addition or subtraction number sentence • solve a variety of simple addition and subtraction word problems in context, eg find the difference, find the sum, change unknown, start unknown simple addition and subtraction word problems • explain and compare strategies used to solve addition and subtraction word problems
Multiplication and Division **B2.5 represent and solve equal-group problems where the total number of items is no more than 10, including problems in which each group is a half, using tools and drawings**				
Represent and solve equal-group problems	Representing and solving equal-group problems	1	Representing and solving equal-group problems with models (total items no more than 10)	• represent and solve equal-group problems with models (total items no more than 10)

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C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.1 identify and describe the regularities in a variety of patterns, including patterns found in real-life contexts**				
Identify and describe patterns	Identifying & describing repeating patterns	1	Identifying the structure of repeating patterns with 1 attribute change	• identify the smallest unit (the core) of a pattern • identify a rule for a repeating pattern, eg 'we are lining up girl, boy, girl, boy'
		2	Describing repeating patterns with 1 attribute change	• copy and describe repeating patterns (only 1 attribute change) using language such as 'goes before', 'goes after', 'repeats'
	Recognizing repeating patterns	1	Recognizing repeating patterns with 1 attribute change and 2 or 3 elements	• identify patterns from sequences of shapes, symbols, objects that do not form patterns
		2	Recognizing repeating patterns with 1 attribute change and 3 or 4 elements	• identify patterns from sequences of shapes, symbols, objects that do not form patterns
		3	Recognizing repeating patterns with 1 attribute change and 4 or 5 elements	• identify patterns from sequences of shapes, symbols, objects that do not form patterns
Patterns **C1.2 create and translate patterns using movements, sounds, objects, shapes, letters, and numbers**				
Create patterns	Creating repeating patterns	1	Creating repeating patterns with 1 attribute change	• create and describe a repeating visual pattern using drawings, or concrete materials (only 1 attribute change)
		2	Creating repeating patterns with 1 attribute change and 2 or 3 elements	• create and describe a repeating visual pattern using drawings, or concrete materials (only 1 attribute change)
		3	Creating repeating patterns with 1 attribute change and 3 or 4 elements	• create and describe a repeating visual pattern using drawings, or concrete materials (only 1 attribute change)
		4	Creating repeating patterns with 1 attribute change and 4 or 5 elements	• create and describe a repeating visual pattern using drawings, or concrete materials (only 1 attribute change)
Patterns **C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns**				
Patterns: extend, predict, identify	Extending a simple repeating pattern	1	Extending a simple repeating pattern with 1 attribute change	• continue a repeating pattern (only 1 attribute change)

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C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns**				
Patterns: extend, predict, identify	Identifying errors & missing elements in patterns	1	Manipulating repeating patterns with 1 attribute change and 2 or 3 elements	• identify errors in simple patterns with 1 attribute change • identify the missing element in a simple pattern • identify the element required to complete a simple given pattern
		2	Manipulating repeating patterns with 1 attribute change and 3 or 4 elements	• identify errors in simple patterns with 1 attribute change • identify the missing element in a simple pattern • identify the element required to complete a simple given pattern
		3	Manipulating repeating patterns with 1 attribute change and 4 or 5 elements	• identify errors in simple patterns with 1 attribute change • identify the missing element in a simple pattern • identify the element required to complete a simple given pattern
Patterns **C1.4 create and describe patterns to illustrate relationships among whole numbers up to 50**				
Create/describe patterns, numbers to 50	Copy/extend additive & subtractive number patterns	1	Recognizing and describing additive and subtractive number patterns (within 5)	• recognize and describe given number patterns that increase or decrease, eg 'the numbers are going up' • recognize and describe given number patterns that increase or decrease, eg 'the numbers are going up'

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Variables **C2.1 identify quantities that can change and quantities that always remain the same in real-life contexts**				
Equalities and Inequalities **C2.2 determine whether given pairs of addition and subtraction expressions are equivalent or not**				
Equivalence: addition and subtraction	Recognizing equality in addition and subtraction	1	Recognizing equality in addition and subtraction number sentences using objects and models for support	• understand the meaning of the equal sign • determine if equations involving addition or subtraction are true or false, eg 6 = 6, 7 = 8 - 1, 5 + 2 = 2
		2	Recognizing and recording equivalent addition and subtraction number sentences (1-digit and 2-digit addition and subtraction)	• model equal number sentences using a variety of concrete and/or pictorial representations and record the equalities symbolically

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C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Equalities and Inequalities C2.3 identify and use equivalent relationships for whole numbers up to 50, in various contexts				
Identify & use equivalent relationships	Recognize the concept of equality, numbers to 50	1	Recognizing the concept of equality in numbers up to 50	• partition whole numbers to 50 in a variety of ways using concrete materials • recognize equality, eg starting with 12 tiles and adding 20 more yields the same result as starting with 30 tiles and adding 2 more • find the missing number to make an addition or subtraction number sentence true (up to 50)

C3. Coding - solve problems and create computational representations of mathematical situations using coding concepts and skills

Quest	Learning Journey	Steps	Content	Detail
Coding Skills C3.1 solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential events				
Write/execute code: sequential events	Write/ execute code: sequential events	1	Creating and using computational representations of real-life situations that involve sequential events	• create computational representations of real-life situations that involve sequential events • use computational representations of real-life situations that involve sequential events • create computational representations of mathematical situations using pseudocode that involve sequential events • solve mathematical problems by writing code, including code that involves sequential events
Coding Skills C3.2 read and alter existing code, including code that involves sequential events, and describe how changes to the code affect the outcomes				
Read/alter code: sequential events	Read/ alter code: sequential events	1	Reading existing code, including code that involves sequential events, and describe how changes to the code affect the outcomes	• read existing code, including code that involves sequential events • describe how changes to the code affect the outcomes • alter code which involves sequential events
			Identifying and correcting errors in an algorithm	• identify and correct errors in an algorithm

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D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Collection and Organization D1.1 sort sets of data about people or things according to one attribute, and describe rules used for sorting				
Sorting sets of data	Grouping simple data using 1 attribute	1	Grouping simple data using 1 attribute	• sort concrete objects (data) into groups according to physical attributes (max number 10);- explain the groups that have been made using their own language • sort concrete objects into given category groups (max number 10)
Data Collection and Organization D1.2 collect data through observations, experiments, or interviews to answer questions of interest that focus on a single piece of information; record the data using methods of their choice; and organize the data in tally tables				
Data collection and recording	Asking simple questions to gather data	1	Asking simple questions to gather data	• ask and answer questions about an attribute, eg colour, shape, size, texture
	Collecting and sorting data in a tally table	1	Introducing and completing tally tables	• collect and sort data using a simple given tally table
Data Visualization D1.3 display sets of data, using one-to-one correspondence, in concrete graphs and pictographs with proper sources, titles, and labels				
Represent data using simple displays	Representing data using simple displays	1	Representing category or discrete data using simple displays	• use concrete materials or pictures of objects as symbols to create data displays where 1 object or picture represents 1 data value (one-to-one correspondence), e.g., use different-coloured blocks to represent different-coloured cars • record data in prepared graphic organizers such as simple bar graphs, pictographs or other diagrams
Data Analysis D1.4 order categories of data from greatest to least frequency for various data sets displayed in tally tables, concrete graphs, and pictographs				
Order category data	Ordering category data	1	Ordering category data from greatest to least frequency for various data sets	• order category data from greatest to least frequency for various data sets displayed in tally tables, concrete graphs and pictographs
Data Analysis D1.5 analyze different sets of data presented in various ways, including in tally tables, concrete graphs, and pictographs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions				
Interpret basic data displays	Interpreting basic data displays	1	Interpreting basic data displays including tally tables, tables and data displays with concrete materials	• describe information presented in tables, lists or other simple data displays using comparative language such as 'more than' and 'less than', eg 'There were more black cars than red cars' • explain interpretations of information presented in data displays, eg 'More children like dogs because there are more dog pictures than cat pictures' • pose questions and write simple sentences to describe data in a display, eg 'The most popular fruit snack is an apple'

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D. Data

D2. Probability - describe the likelihood that events will happen, and use that information to make predictions

Quest	Learning Journey	Steps	Content	Detail
Probability **D2.1 use mathematical language, including the terms “impossible”, “possible”, and “certain”, to describe the likelihood of events happening, and use that likelihood to make predictions and informed decisions**				
Use the basic language of probability	Using the basic language of probability	1	Using the basic language of probability: impossible, unlikely, less likely, more likely, certain	• describe outcomes in everyday activities and events as being 'impossible', 'unlikely', 'less likely', 'more likely', 'certain'
Probability **D2.2 make and test predictions about the likelihood that the categories in a data set from one population will have the same frequencies in data collected from a different population of the same size**				

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E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Geometric Reasoning E1.1 sort three-dimensional objects and two-dimensional shapes according to one attribute at a time, and identify the sorting rule being used				
Sort 3D objects and 2D shapes	Sorting 3D objects, 1 attribute	1	Sorting three-dimensional objects using 1 attribute	• sort basic three-dimensional objects by 1 attribute and explain the attribute used to sort, e.g., shape, colour, size, function • recognize and explain how a group of objects has been sorted (1 attribute only)
	Sorting 3D objects, more than 1 attribute	1	Sorting three-dimensional objects using more than 1 basic attributes	• sort three-dimensional objects and explain the attribute used to sort, eg shape, colour, size, function • recognize and explain how a group of objects has been sorted
	Sorting basic 2D shapes, 1 attribute	1	Sorting basic two-dimensional shapes by 1 attribute	• recognize and explain how a group of two-dimensional shapes as been sorted, e.g., size or shape • sort a group of two-dimensional shapes by 1 attribute, e.g., size, colour, shape • compare similarities and differences using informal language
	Sorting basic 2D shapes, more than 1 attribute	1	Sorting basic two-dimensional shapes by more than 1 attribute	• recognize and explain how a group of two-dimensional shapes as been sorted, e.g., size or shape • sort a group of two-dimensional shapes by attributes such as size, colour, shape • compare similarities and differences using informal language
Geometric Reasoning E1.2 construct three-dimensional objects, and identify two-dimensional shapes contained within structures and objects				
Construct three-dimensional structures	Constructing three-dimensional structures	1	Building three-dimensional structures	• build three-dimensional structures using concrete materials • describe the two-dimensional shapes that the structure contains
Geometric Reasoning E1.3 construct and describe two-dimensional shapes and three-dimensional objects that have matching halves				
Location and Movement E1.4 describe the relative locations of objects or people, using positional language				
Describe relative locations	Describing position and movement	1	Describing position and movement using everyday language	• describe the position of stationary objects/people in relation to other objects/people and structures using everyday language • interpret the everyday language of position to move objects
	Distinguishing between left and right	1	Distinguishing between left and right from own perspective	• describe the position of an object as to the left or right of another object from their own perspective • move objects to the left or right as instructed

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E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Location and Movement E1.5 give and follow directions for moving from one location to another				
Give and follow directions	Following directions to move between locations	1	Following given directions to move between locations	• follow directions to move themselves between 2 locations
	Giving directions	1	Giving directions	• give directions to another person to place themselves in a specific location • give directions to another person to place an object in a specific location

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Attributes E2.1 identify measurable attributes of two-dimensional shapes and three-dimensional objects, including length, area, mass, capacity, and angle				
Identify measurable attributes	Introducing the attribute of length	1	Introducing the attribute of length	• use everyday language to describe length, eg long, short, high, tall, low
	Introducing the attribute of mass	1	Introducing the concept of mass: mass as an attribute of an object and the language of mass	• use the language of mass;- heavy, light, easy/hard to push, easy/hard to pull
	Introducing the attributes of volume and capacity	1	Introducing the attributes of volume and capacity	• use the terms 'full', 'empty' and 'about half-full' to describe the amount of substance in a container
	Introducing the attribute of area	1	Exploring the attribute of area	• define area as an attribute • identify areas in the environment • describe areas using everyday language, such as 'surface', 'inside', 'outside' • understand that the area remains the same if a given area is divided up and rearranged into a new configuration (conservation)
	Introducing angles as a measurable attribute	1	Introducing angles as a measurable attribute	• identify angles in two-dimensional shapes and three-dimensional objects

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E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Attributes **E2.2 compare several everyday objects and order them according to length, area, mass, and capacity**				
Compare and order objects by attributes	Compare/ order 2 or more lengths, informal units	1	Comparing 2 or more lengths using informal units	• use uniform informal units, eg handprints, to compare lengths of 2 or more everyday objects • check by placing the objects side-by-side and aligning the ends
		2	Ordering 2 or more lengths using informal units	• use uniform informal units, eg handprints, to order lengths of 2 or more everyday objects • check by placing the objects side-by-side and aligning the ends
	Compare areas using direct comparison	1	Comparing areas using direct comparison	• compare areas by positioning one area over another area • compare areas by tracing one area and placing it over the top of another area • describe one area as larger than, the same as (about the same as), or smaller than another area
	Compare/ order mass of 2 objects, pan balance	1	Comparing and describing mass of 2 objects using a pan balance	• establish meaning of a 'level balance' and describe the 2 objects as having 'equal mass/weight' • create a level balance when a larger object is placed on 1 side of a pan balance using smaller objects on the other side • describe the results of imbalance of a pan balance using the terms 'heavier' and 'lighter'
		2	Ordering more than 2 objects by mass using a pan balance	• order more than 2 objects by mass using a pan balance • predict and explain comparisons (transitivity)
	Compare/ order volume and capacity, informal units	1	Comparing and ordering the volume and capacity of 2 or more containers using uniform informal units	• compare the capacities of 2 or more containers using appropriate uniform informal units, eg count the number of times a smaller container can be filled and emptied into the containers being measured • order containers in terms of capacity • predict the larger volume or capacity of 2 or more containers and check by measuring using uniform informal units • recognize that containers of different shapes may have the same capacity
	Compare capacities, direct comparison			

Ontario Curriculum Grades 1

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Time **E2.3 read the date on a calendar, and use a calendar to identify days, weeks, months, holidays, and seasons**				
The calendar	Introducing the days of the week	1	Introducing days of the week	• name and order the days of the week • determine the day before or after a given day • classify days of the week as weekdays or weekend days • use the terms 'today', 'tomorrow' and 'yesterday' in relation to days of the week
	Introducing the months of the year	1	Introducing the months of the year	• know that there are 12 months in a year • name and order the months of the year • determine the month before or after a given month • relate familiar events to the month of the year in which they occur • sequence familiar events according to the months of the year in which they occur
	Introducing the seasons	1	Introducing the seasons	• know that there are 4 seasons in a year • name and order the seasons of the year • know and recall the months for each season • describe the environmental characteristics of each season • recognize that the seasons are opposite in the opposite hemisphere of the planet • relate familiar events to the season of the year in which they occur
	Using calendars	1	Introducing calendars	• identify elements of a conventional calendar (month, day, date) • identify a day and date using a conventional calendar • relate calendars to seasons and significant dates • relate calendars to the parts of a written date
		2	Interpreting calendars	• locate today on a calendar and record the date • locate yesterday and tomorrow on a calendar and record their dates • locate any given date on a calendar
		3	Using calendars to solve problems	• locate any given date, including today's date, on a calendar • use a calendar to locate the date to match a given description, eg if today is Monday 8th April, then what is the date on Thursday?;- find the date of the third Thursday in March • use a calendar to determine the number of days, weeks or months until a future event or between events • use a calendar to calculate and describe lengths of time in days/weeks

Ontario Curriculum Grades 1

Understanding Practice and Fluency (UPF)

F. Financial Literacy

F1. Money and Finances - demonstrate an understanding of the value of Canadian currency

Quest	Learning Journey	Steps	Content	Detail
Money Concepts F1.1 identify the various Canadian coins up to 50¢ and coins and bills up to $50, and compare their values				
Identifying coins and bills	Identifying coins	1	Recognizing coins | Canada	• recognize and name Canadian coins by their common names: penny, nickel, dime, quarter, half dollar, loonie, toonie • recognize the monetary value of Canadian coins and relate these values to their common names • order Canadian coins by value • sort coins into groups of the same denomination
	Identifying bills	1	Recognizing bills | Canada	• recognize the monetary value of Canadian bills • order Canadian bills by value • order Canadian coins and bills by value • sort bills into groups of the same denomination

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers **B1.1 read, represent, compose, and decompose whole numbers up to and including 200, using a variety of tools and strategies, and describe various ways they are used in everyday life**				
Numbers up to 200	Reading and writing 3-digit numbers to 200	1	Reading and writing 3-digit numbers to 200 using words and numbers	• write a given 3-digit number to 200 in words, eg 156 as one hundred fifty-six • write the numbers for a 3-digit number to 200 given in words
	Reading and writing 2-digit numbers	1	Reading and writing 2-digit numbers using words and numerals	• write a given 2-digit number in words, eg 67 as sixty-seven • write the numerals for a 2-digit number given in words
	Using place value to partition 2-digit numbers	1	Using place value to partition 2-digit numbers	• use place value equipment and models, eg tens frames, to partition a given 2-digit number into tens and ones • model and describe a 2-digit number in both words and numerals, eg 53 as '5 tens and 3 ones' or '50 and 3' • model a number expressed in words, eg '6 tens and 2 ones'
	Identifying place value: 2-digit numbers	1	Identifying the place value of digits in 2-digit numbers	• write the numeral for a 2-digit number modelled using place value equipment • identify the digit in the tens or ones column for a given 2-digit number • write the numeral for a 2-digit number modelled using place value equipment • identify the digit in the tens or ones column for a given 2-digit number
	Partitioning 3-digit numbers to 200	1	Using place value to partition 3-digit numbers to 200	• use place value equipment to partition a given 3-digit number to 200 into hundreds, tens and ones • describe a 3-digit number to 200 using words, eg 123 as '1 hundred, 2 tens and 3 ones' • write a 3-digit number to 200 in expanded notation, eg 123 as 100 + 20 + 3 • write the number for a number represented by expanded notation
	Identifying place value: 3-digit numbers to 200	1	Identifying the place value of digits in 3-digit numbers to 200	• write the number for a 3-digit number to 200 modelled using place value equipment • identify the digit in the hundreds, tens or ones column for a given 3-digit number to 200 • recognize that the value of the digit is determined by its place value, eg in 189 the digit 8 has a place value of tens and a total value of 80 • identify, record and model a number using place value clues, eg 'a 1 in the hundreds and a 2 in the ones' as 102 • create the smallest and largest numbers possible using 3 digits

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.1 read, represent, compose, and decompose whole numbers up to and including 200, using a variety of tools and strategies, and describe various ways they are used in everyday life				
Numbers up to 200	Non-standard partitioning: 2-digit numbers	1	Partitioning 2-digit numbers using non-standard partitioning	• use place value equipment and models, eg tens frames, to partition a given 2-digit number using non-standard partitioning, eg, 35 as 2 tens and 15 ones • model and identify a number from non-standard partitioning, eg, recognize 4 tens and 13 ones as 53
	Non-standard partitioning: 3-digit numbers to 200	1	Partitioning 3-digit numbers to 200 using non-standard partitioning	• use place value equipment to partition a given 3-digit number to 200 using non-standard partitioning, eg 175 as 1 hundreds and 75 ones or 100 + 75 • model and identify a number from non-standard partitioning, eg recognize 1 hundred, 4 tens and 27 ones or 100 + 40 + 27 as 167
Whole Numbers B1.2 compare and order whole numbers up to and including 200, in various contexts				
Compare and order numbers to 200	Comparing and ordering numbers to 200	1	Comparing numbers to 200	• model and compare two numbers up to 200 using place value equipment • compare 2 numbers up to 200
		2	Ordering numbers to 200	• order up to 4 consecutive numbers to 200 from smallest to largest or largest to smallest;- explain the reason for the order given • order up to 4 non-consecutive numbers up to 200 from smallest to largest or largest to smallest;- explain the reason for the order given
Whole Numbers B1.3 estimate the number of objects in collections of up to 200 and verify their estimates by counting				
Whole Numbers B1.4 count to 200, including by 20s, 25s, and 50s, using a variety of tools and strategies				
Count to 200	Counting by 1s to 200, forward and backward	1	Counting forward by 1s to 200	• count forward by 1s from any number to 200 • identify missing numbers on a number line to 200
		2	Counting backward by 1s to 200	• count backward by 1s from any number to 200 • identify missing numbers on a number line to 200

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.4 count to 200, including by 20s, 25s, and 50s, using a variety of tools and strategies				
Count to 200	Counting by 10s to 200, forwards and backwards	1	Counting by skip counting forwards by 10s from any multiple of 10 to 200	• use concrete materials, models, drawings, number lines/ charts to skip count forwards by 10s from any multiple of 10 up to 200 • skip count forwards by 10s from any multiple of 10 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		2	Counting by skip counting backwards by 10s from any multiple of 10 up to 200	• use concrete materials, models, drawings, number lines/ charts to skip count backwards by 10s from any multiple of 10 up to 200 • skip count backwards by 10s from any multiple of 10 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		3	Counting by skip counting forwards or backwards by 10s from any multiple of 10 up to 200	• use concrete materials, models, drawings, number lines/ charts to skip count forwards or backwards by 10s from any multiple of 10 up to 200 • skip count forwards or backwards by 10s from any multiple of 10 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
	Counting by 2s to 200, forward and backward	1	Counting by skip counting forwards by 2s from any multiple of 2 to 200	• use concrete materials, models, drawings, number lines/ charts to skip count forwards by 2s from any multiple of 2 up to 200 • skip count forwards by 2s from any multiple of 2 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		2	Counting by skip counting backwards by 2s from any multiple of 2 up to 200	• use concrete materials, models, drawings, number lines/ charts to skip count backwards by 2s from any multiple of 2 up to 200 • skip count backwards by 2s from any multiple of 2 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		3	Counting by skip counting forwards or backwards by 2s from any multiple of 2 up to 200	• use concrete materials, models, drawings, number lines/ charts to skip count forwards or backwards by 2s from any multiple of 2 up to 200 • skip count forwards or backwards by 2s from any multiple of 2 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.4 count to 200, including by 20s, 25s, and 50s, using a variety of tools and strategies				
Count to 200	Counting by 5s to 200, forwards and backwards	1	Counting by skip counting forwards by 5s from any multiple of 5 to 200	• use concrete materials, models, drawings, number lines/ charts to skip count forwards by 5s from any multiple of 5 up to 200 • skip count forwards by 5s from any multiple of 5 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		2	Counting by skip counting backwards by 5s from any multiple of 5 up to 200	• use concrete materials, models, drawings, number lines/ charts to skip count backwards by 5s from any multiple of 5 up to 200 • skip count backwards by 5s from any multiple of 5 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		3	Counting by skip counting forwards or backwards by 5s from any multiple of 5 up to 200	• use concrete materials, models, drawings, number lines/ charts to skip count forwards or backwards by 5s from any multiple of 5 up to 200 • skip count forwards or backwards by 5s from any multiple of 5 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
	Counting by 20s to 200, forward and backward	1	Counting by skip counting forward or backward by 20s to 200	• use concrete materials, models, drawings, number lines/ charts to skip count forward or backward by 20s to 200 • skip count forward or backward by 20s by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
	Counting by 25s to 200, forward and backward	1	Counting by skip counting forward or backward by 25s to 200	• use concrete materials, models, drawings, number lines/ charts to skip count forward or backward by 25s to 200 • skip count forward or backward by 25s by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
	Counting by 50s to 200, forward and backward	1	Counting by skip counting forward or backward by 50s to 200	• use concrete materials, models, drawings, number lines/ charts to skip count forward or backward by 50s to 200 • skip count forwards or backward by 50s by memory and an understanding of the number sequence • recognize an error in the skip counting sequence

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.5 describe what makes a number even or odd				
Odd and even numbers	Modelling odd and even number patterns up to 20	1	Modelling odd and even number patterns up to 20	• model odd and even numbers using objects such as counters paired in 2 rows • describe the pattern created using the terms 'odd' or 'even' numbers
Fractions B1.6 use drawings to represent, solve, and compare the results of fair-share problems that involve sharing up to 10 items among 2, 3, 4, and 6 sharers, including problems that result in whole numbers, mixed numbers, and fractional amounts				
Fair-share problems: 2, 3, 4, 6 sharers	Fair-share problems with models, 2 or 4 sharers	1	Representing, solving and comparing fair-share problems that involve sharing up to 10 items among 2 or 4 sharers using models	• represent and solve fair-share problems that involve sharing up to 10 items among 2 or 4 sharers using models • compare the results of fair-share problems that involve sharing up to 10 items among 2 or 4 sharers using models
	Fair-share problems with models, 3 sharers	1	Representing, solving and comparing fair-share problems that involve sharing up to 10 items among 3 sharers using models	• represent and solve fair-share problems that involve sharing up to 10 items among 3 sharers using models • compare the results of fair-share problems that involve sharing up to 10 items among 3 sharers using models
	Fair-share problems with models, 6 sharers	1	Representing, solving and comparing fair-share problems that involve sharing up to 10 items among 6 sharers using models	• represent and solve fair-share problems that involve sharing up to 10 items among 6 sharers using models • compare the results of fair-share problems that involve sharing up to 10 items among 6 sharers using models
Fractions B1.7 recognize that one third and two sixths of the same whole are equal, in fair-sharing contexts				
Equivalence, one third and two sixths	Equivalence, one third and two sixths	1	Recognizing that one third and two sixths of the same whole are equal, in fair-sharing contexts	• recognize that one third and two sixths of the same whole are equal, in fair-sharing contexts

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Properties and Relationships B2.1 use the properties of addition and subtraction, and the relationships between addition and multiplication and between subtraction and division, to solve problems and check calculations				
Properties and operational relationships	Using the commutative property of addition to 20	1	Using the commutative property of addition to find missing numbers (up to 20)	• develop an understanding of the commutative property of addition and complete number sentences in addition and subtraction fact families, eg 9 + 6 = 15, 6 + 9 = 15, 15 - 6 = 9, 15 - 9 = 6
	Using repeated addition to multiply	1	Using repeated addition to multiply	• recognize and describe the relationship between, eg, 3 groups of 4 as 4 + 4 + 4 • use empty number lines and number charts to help solve multiplication problems using repeated addition (2s, 5s, 10s, 3s, 4s) • explore the use of repeated addition to count in practical situations • apply known facts, such as doubles, to repeated addition problems, e.g., 5 + 5 + 5 + 5 as 10 + 10
	Using repeated subtraction to divide	1	Using repeated subtraction to divide	• solve division problems (group size known, number of groups unknown) using repeated subtraction and concrete materials, models or drawings of groups or arrays • use an empty number line or number chart to represent division problems as repeated subtraction (group size known ... number of groups unknown) • explore the use of repeated subtraction in practical situations
Math Facts B2.2 recall and demonstrate addition facts for numbers up to 20, and related subtraction facts				
Addition/ subtraction facts to 20	Adding and subtracting within 20 fluently	1	Adding and subtracting within 20 fluently	• use known mental strategies to add and subtract fluently within 20
Mental Math B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 50, and explain the strategies used				
Mental math: add/subtract to 50	Bridging to ten to mentally add or subtract	1	Bridging to ten to mentally add or subtract a 1-digit and 2-digit number	• use bridging to ten to solve addition and subtraction problems with 1- and 2-digit numbers • use bridging to ten to solve addition and subtraction problems with 1- and 2-digit numbers where the change is unknown, eg 25 + ? = 32
	Using place value to mentally add numbers	1	Adding 2-digit and 1-digit numbers using place value understanding (split strategy)	• mentally solve the addition of a 2-digit and 1-digit number using place value partitioning • record and explain the use of the strategy

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.4 use objects, diagrams, and equations to represent, describe, and solve situations involving addition and subtraction of whole numbers that add up to no more than 100**				
Add and subtract to 100	Add/subtract numbers using efficient strategies	1	Adding and subtracting 1 digit to/from 2-digit numbers using efficient strategies (max sum 100)	• select, use and record an efficient strategy to solve an addition or subtraction problem (max sum 100) • check the solution to an addition or subtraction problem using a different strategy • recognize the most efficient strategy and explain why
	Add 2-digit numbers, number line	1	Adding two 2-digit numbers using place value partitioning on a number line (jump strategy)	• use an empty number line to model and solve the addition of two 2-digit numbers, eg solve 35 + 43 as 35 + 40 = 75 then 75 + 3 = 78 • record and explain the use of the strategy
	Subtract 2-digit numbers, number line	1	Subtracting two 2-digit numbers using place value partitioning on a number line (jump strategy)	• use an empty number line to model and solve the subtraction of two 2-digit numbers by counting back, eg solve 52 − 23 as 52 − 20 = 32 then 32 − 3 = 29 (max sum 100) • record and explain the use of the strategy
	Add tens to a 2-digit number, models	1	Adding tens to a 2-digit number using models and/or equipment for support	• add ten and multiples of ten to a give 2-digit number, eg 36 + 20 = 56 (max sum 100)
	Subtract tens from a 2-digit number, models	1	Subtracting tens from a 2-digit number using models and/or equipment for support	• subtract ten and multiples of ten to a give 2-digit number, eg 36 - 20 = 16 (max sum 100)
Multiplication and Division **B2.5 represent multiplication as repeated equal groups, including groups of one half and one fourth, and solve related problems, using various tools and drawings**				
Multiplication as repeated equal groups	Use repeated addition with arrays (2, 5, 10)	1	Using repeated addition with arrays (2, 5, 10)	• solve simple multiplication problems represented in arrays by using repeated addition (up to 50) • describe using, eg '_groups of _ is the same as _ + _ + _'
	Connect multiplication, arrays, repeated addition	1	Connecting the multiplication symbol with arrays and repeated addition	• represent and solve simple multiplication problems represented in arrays by using repeated addition • describe using, eg '_groups of _ is the same as _ + _ + _' • connect the multiplication symbol with statements about groups of and repeated addition, eg 3 groups of 5 is 5 + 5 + 5 or 3 x 5 = 15
	Repeated addition with one half and one fourth	1	Representing multiplication by using repeated addition with one half and one fourth, models	• represent multiplication by using repeated addition with one half, models • represent multiplication by using repeated addition with one fourth, models

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.6 represent division of up to 12 items as the equal sharing of a quantity, and solve related problems, using various tools and drawings				
Represent division up to 12	Sharing objects to divide up to 12, models	1	Sharing objects to divide up to 12, models	• share a collection of objects equally into a given number of groups using concrete materials, models or drawings, eg '12 balloons shared by 3 children, how many balloons will they each get?' • relate to multiplication by recombining the groups, eg by counting or skip counting to check the total number of objects

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns C1.1 identify and describe a variety of patterns involving geometric designs, including patterns found in real-life contexts				
Identify/ describe geometric patterns	Exploring visual patterns	1	Exploring and representing growing, shrinking and repeating visual patterns	• identify repeating, growing and shrinking patterns found in real-life contexts (eg, wallpaper pattern, music) • represent a given growing or shrinking pattern in a variety of ways, eg represent a letter pattern A, AA, AAA, AAAA in a variety of ways
	Exploring simple patterns with transformations	1	Exploring simple patterns with transformations	• identify a pattern involving simple transformations • copy and continue patterns involving transformations
Patterns C1.2 create and translate patterns using various representations, including shapes and numbers				
Create patterns with shapes and numbers	Create repeating shape patterns	1	Creating repeating patterns with 1 attribute change and 4 or 5 elements	• create and describe a repeating visual pattern using drawings, or concrete materials (only 1 attribute change) • create and describe the rule for a repeating pattern that includes sounds or actions
	Identify/extend/ describe repeating number patterns	1	Identifying, extending and describing repeating numeric patterns	• identify and extend through investigation, numeric repeating patterns, eg 1, 2, 1, 2, 1, 2, • describe numeric repeating patterns
Patterns C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns represented with shapes and numbers				
Pattern rules, repeating patterns	ID errors/missing elements, repeating patterns	1	Manipulating repeating patterns with 1 attribute change and 4 or 5 elements	• identify errors in simple patterns with 1 attribute change • identify the missing element in a simple pattern • identify the element required to complete a simple given pattern
	Identify the structure of repeating patterns	1	Identifying the structure of repeating patterns with 1 attribute change	• identify the smallest unit (the core) of a pattern • identify a rule for a repeating pattern, eg 'we are lining up girl, boy, girl, boy'
	Extend repeating patterns	1	Extending repeating patterns with more than 1 attribute change	• continue and describe the rule for a repeating pattern (can include more than 1 attribute change)

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.4 create and describe patterns to illustrate relationships among whole numbers up to 100**				
Create/describe patterns, numbers to 100	Growing/ shrinking/ repeating number patterns to 100	1	Exploring growing, shrinking and repeating number patterns up to 100	• identify and describe growing and shrinking number patterns involving addition or subtraction
		2	Extending, completing and describing simple additive or subtractive number patterns with 1 operation (within 10) up to 100	• determine a missing number in a number pattern, eg 3, 7, 11, _, 19 • explain how a solution was determined and check solutions by repeating the pattern • describe a number pattern in words, eg 'It goes up by 3s'
	Identify and describe number patterns to 100	1	Identifying and describing number patterns (1s, 2s, 5s, 10s, 25s) up to 100	• identify and describe growing and shrinking patterns generated by the repeated addition or subtraction of 1s, 2s, 5s, 10s or 25s on a number line or number chart

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Variables **C2.1 identify when symbols are being used as variables, and describe how they are being used**				
Equalities and Inequalities **C2.2 determine what needs to be added to or subtracted from addition and subtraction expressions to make them equivalent**				
Explore equality, addition/ subtraction	Exploring equality, addition/ subtraction	1	Exploring equality and inequality (up to 20)	• create a set in which the number of objects is greater than, less than or equal to the number of objects in a given set • demonstrate examples of equality and inequality through investigation, using a balance model;- describe equality as balance and inequality as imbalance, concretely and pictorially • determine through investigation using a balance model and whole numbers to 20 the number of identical objects that must be added or subtracted to establish equality • determine if 2 given concrete sets are equal or unequal and explain the process used

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Equalities and Inequalities C2.3 identify and use equivalent relationships for whole numbers up to 100, in various contexts				
Equivalent relationships to 100	Equivalent addition/ subtraction relationships	1	Recognizing and recording equivalent addition and subtraction number sentences (1-digit and 2-digit addition and subtraction)	• determine, through investigation using models and objects for support, whether the 2 sides of a given addition or subtraction number sentence are equal or not equal using symbols;- justify the answer • model equal number sentences using a variety of concrete and/or pictorial representations and record the equalities symbolically • justify solutions when completing number sentences

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Equalities and Inequalities C2.3 identify and use equivalent relationships for whole numbers up to 100, in various contexts				
Equivalent relationships to 100	Equivalent addition/ subtraction relationships	1	Recognizing and recording equivalent addition and subtraction number sentences (1-digit and 2-digit addition and subtraction)	• determine, through investigation using models and objects for support, whether the 2 sides of a given addition or subtraction number sentence are equal or not equal using symbols;- justify the answer • model equal number sentences using a variety of concrete and/or pictorial representations and record the equalities symbolically • justify solutions when completing number sentences

C3. Coding - solve problems and create computational representations of mathematical situations using coding concepts and skills

Quest	Learning Journey	Steps	Content	Detail
Coding Skills C3.1 solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential and concurrent events				
Write code: sequential/ concurrent events	Write/execute code: sequential/ concurrent events	1	Creating and using computational representations of real-life situations that involve sequential and concurrent events	• create computational representations of real-life situations that involve sequential and concurrent events
		2	Creating and using computational representations of real-life situations that involve sequential and concurrent events	• use computational representations of real-life situations that involve sequential and concurrent events
		3	Creating computational representations of mathematical situations using pseudocode that involves sequential and concurrent events	• create computational representations of mathematical situations by writing code, including code that involves sequential and concurrent events
		4	Solving mathematical problems by writing code, including code that involves sequential and concurrent events	• solve problems by writing code, including code that involves sequential and concurrent events

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

C. Algebra

C3. Coding - solve problems and create computational representations of mathematical situations using coding concepts and skills

Quest	Learning Journey	Steps	Content	Detail
Coding Skills C3.2 read and alter existing code, including code that involves sequential and concurrent events, and describe how changes to the code affect the outcomes				
Read code: sequential/ concurrent events	Read/alter code: sequential/ concurrent events	1	Reading existing code, including code that involves sequential and concurrent events, and describe how changes to the code affect the outcomes	• read existing code, including code that involves sequential and concurrent events and describe how changes to the code affect the outcomes
		2	Identifying and correcting errors in an algorithm	• identify errors in an algorithm
		3	Identifying and correcting errors in an algorithm	• correct errors in an algorithm
		4	Exploring computational representations of mathematical situations	• explore computational representations of mathematical situations

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Collection and Organization D1.1 sort sets of data about people or things according to two attributes, using tables and logic diagrams, including Venn and Carroll diagrams				
Sort data according to 2 attributes	Introducing Venn diagrams	1	Introducing Venn diagrams	• group data according to physical attributes given • look at sorted data and identify the physical attributes by which they have been sorted
	Introducing Carroll diagrams	1	Introducing Carroll diagrams	• sort data about people or things according to 2 attributes • look at sorted data and identify the attributes by which they have been sorted
	Relating Carroll and Venn diagrams	1	Relating Carroll and Venn diagrams	• group data according to physical attributes given • look at sorted data and identify the physical attributes by which they have been sorted
	Sorting data using logic diagrams	1	Sorting sets of data about people or things according to 2 attributes using logic diagrams	• sort sets of data about people or things according to 2 attributes using logic diagrams
Data Collection and Organization D1.2 collect data through observations, experiments, or interviews to answer questions of interest that focus on two pieces of information, and organize the data in two-way tally tables				
Collect/organize data, two-way tables	Collecting data	1	Collecting data about the class or school to answer a given question	• determine what data to gather in order to investigate a question of interest, eg colour, mode of transport, gender, type of animal, sport • predict the likely responses within data to be collected;- adjust questions if necessary • collect data through questioning and record the data using tally marks • identify categories of data and use them to sort data, eg sort data collected on attendance by day of the week and into boys and girls present
	Organizing data in a two-way tally table	1	Organizing data in Carroll diagrams	• organize data in a Carroll diagram that focuses on 2 pieces of information
Data Visualization D1.3 display sets of data, using one-to-one correspondence, in concrete graphs, pictographs, line plots, and bar graphs with proper sources, titles, and labels				
Pictographs, line plots, and bar graphs	Representing and reading data in pictographs	1	Representing and reading category data in a pictograph	• represent category data in a pictograph using a baseline, equal spacing, same-sized symbols and a key indicating one-to-one correspondence • read and interpret data represented in a pictograph;- pose and answer simple summative and comparative questions, eg 'Which is the least favourite season?'

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Visualization **D1.3 display sets of data, using one-to-one correspondence, in concrete graphs, pictographs, line plots, and bar graphs with proper sources, titles, and labels**				
Pictographs, line plots, and bar graphs	Representing and reading data in line plots	1	Representing and reading data in basic line plots (dot plots)	• order discrete data sets represented with concrete objects, numbers or symbols • record discrete data in a table showing frequency • represent discrete data sets on a simple line plot with a single scale • read and interpret simple discrete data sets represented on a line plot;- pose and answer questions
	Representing and reading data in bar graphs	1	Representing and reading data in a given bar graph with one-to-one correspondence	• complete a vertical or horizontal bar graph (one-to-one correspondence) ;- choose the correct title for a bar graph • answer one-step and two-step questions, eg, 'How many more students like reading than art?';- identify basic similarities and differences between categories;- make simple conclusions • agree or disagree with simple statements made by others related to data in a bar graph
Data Analysis **D1.4 identify the mode(s), if any, for various data sets presented in concrete graphs, pictographs, line plots, bar graphs, and tables, and explain what this measure indicates about the data**				
Identify and explain the mode	Identifying and explaining the mode	1	Identifying and explaining the mode of a data set presented in various data displays	• identify and explain the mode of a data set presented in a pictograph • identify and explain the mode of a data set presented in a line plot • identify and explain the mode of a data set presented in a bar graph • identify and explain the mode of a data set presented in a table
Data Analysis **D1.5 analyze different sets of data presented in various ways, including in logic diagrams, line plots, and bar graphs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions**				
Analyze data	Analyzing data in a line plot	1	Introducing and reading basic line plots (dot plots)	• read and interpret simple discrete data sets represented on a line plot;- pose and answer questions
	Analyzing data in a bar graph	1	Introducing and reading data in bar graphs with one-to-one correspondence	• become familiar with the structure and layout of a basic bar graph including title, labels on each axis, equal spacing • answer one-step and two-step questions, eg, 'How many more students like reading than art?';- identify basic similarities and differences between categories;- make simple conclusions • recognize and remedy errors in bar graphs
	Analyzing data in a logic diagram	1	Analyzing data in logic diagrams	• ask and answer questions about the data • draw conclusions then make convincing arguments and informed decisions

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

D. Data

D2. Probability - describe the likelihood that events will happen, and use that information to make predictions

Quest	Learning Journey	Steps	Content	Detail
Probability **D2.1 use mathematical language, including the terms "impossible", "possible", and "certain", to describe the likelihood of complementary events happening, and use that likelihood to make predictions and informed decisions**				
Probability: complementary events	Exploring complementary events	1	Exploring everyday events that cannot occur simultaneously	• identify and discuss everyday events that cannot occur at the same time
	Using probability language, complementary events	1	Using the language of probability, including the terms "impossible", "possible", and "certain", to describe the likelihood of complementary events happening	• use the language of probability, including the terms "impossible", "possible", and "certain", to describe the likelihood of complementary events happening
Probability **D2.2 make and test predictions about the likelihood that the mode(s) of a data set from one population will be the same for data collected from a different population**				

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Geometric Reasoning E1.1 sort and identify two-dimensional shapes by comparing number of sides, side lengths, angles, and number of lines of symmetry				
Sort and identify two-dimensional shapes	Comparing two-dimensional shapes	1	Comparing 1 shape with another: squares, rectangles, circles and triangles	• describe similarities and differences in terms of number of sides, side lengths and corners
	Identifying and naming two-dimensional shapes	1	Identifying and naming two-dimensional shapes	• identify and name two-dimensional shapes including octagons, pentagons, circles, hexagons, triangles and quadrilaterals by their number of sides • select a shape from a description of its features, eg number of sides or vertices • measure and describe the side properties of the special quadrilaterals, including parallelograms, rectangles, rhombuses, squares, trapezoids and kites • identify and name shapes in pictures, designs and the environment
	Sorting two-dimensional shapes	1	Sorting two-dimensional shapes	• sort regular and irregular two-dimensional shapes in various orientations including octagons, pentagons, circles, hexagons, triangles, quadrilaterals;- explain the attribute used to sort, eg size • sort regular and irregular two-dimensional shapes in various orientations including octagons, pentagons, circles, hexagons, triangles, quadrilaterals using a given attribute, eg number of sides or vertices
	Recognizing line symmetry	1	Recognizing line symmetry in the environment	• observe and describe symmetry informally in everyday objects, pictures, designs and shapes • identify shapes that are symmetrical and are not symmetrical by folding to test for symmetry • sort objects, pictures, designs and/or shapes according to whether they are symmetrical or not • draw a single line of symmetry on given pictures, designs and shapes

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Geometric Reasoning **E1.2 compose and decompose two-dimensional shapes, and show that the area of a shape remains constant regardless of how its parts are rearranged**				
Geometric Reasoning **E1.3 identify congruent lengths and angles in two-dimensional shapes by mentally and physically matching them, and determine if the shapes are congruent**				
Introduce congruent shapes	Introducing congruent shapes	1	Introducing congruent shapes	• identify shapes in different orientations which have the same properties as a given shape by manipulating or matching and recognize them as 'the same'
Location and Movement **E1.4 create and interpret simple maps of familiar places**				
Create and interpret simple maps	Creating and interpreting simple maps	1	Interpreting simple maps	• interpret simple maps of familiar locations and describe the location of specific features relative to other features • describe, using landmarks and directional language, a path from 1 feature to another on a simple map
		2	Creating simple maps	• draw simple maps of familiar locations such as the classroom, school or local area (no grid referencing) • use technology to create simple maps of familiar locations such as the classroom, school or local area (no grid referencing)
Location and Movement **E1.5 describe the relative positions of several objects and the movements needed to get from one object to another**				
Describe relative positions & movements	Describing relative positions & movements	1	Describing position and movement using everyday language	• describe the position of stationary objects/people in relation to themselves using everyday language • describe the position of stationary objects/people in relation to other objects/people and structures using everyday language • interpret the everyday language of position to move themselves • interpret the everyday language of position to move objects

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Length E2.1 choose and use non-standard units appropriately to measure lengths, and describe the inverse relationship between the size of a unit and the number of units needed				
Measure length, non-standard units	Measuring length, non-standard units	1	Exploring uniform informal units of length and distance	• identify appropriate uniform informal units to measure lengths and distances, e.g., paper clips instead of craft sticks to measure a pencil;- explain the relationship between the size of a unit and the number of units needed, eg, more paper clips than craft sticks will be needed to measure the length of the desk • record lengths using informal units, eg, the pencil is __ units long • recognize the need for uniform units and the need to place the units end-to-end without gaps or overlaps • recognize that the length of an object remains the same even when the units are rearranged • recognize that the length of an object remains the same even when the orientation changes • investigate different informal units of length used in various cultures
	Measuring length using unit iteration	1	Measuring length using unit iteration	• measure lengths and distances with an informal unit by using the 'make, mark and move' strategy • record lengths and distances by referring to the number and type of uniform informal unit used
Length E2.2 explain the relationship between centimetres and metres as units of length, and use benchmarks for these units to estimate lengths				
Introduce centimetres and metres	Introducing formal units for length: metres	1	Introducing formal units for length: metres	• recognize the need for formal units to measure lengths and distances • develop a personal reference for the approximate length of 1 m • estimate and use the metre as a unit to measure lengths and distances to the nearest metre or half metre • record lengths and distances using the abbreviation for metres (m) • compare lengths with the same standard unit
	Introducing formal units for length: centimetres	1	Introducing formal units for length: centimetres	• recognize the need for a formal unit smaller than the metre • develop a personal reference for the approximate length of 1 cm • recognize and model that there are 100 cm in 1 m ie 100 cm = 1 m • estimate and use the centimetre as a unit to measure lengths, to the nearest centimetre, using a device with 1 cm markings, eg use a paper strip of length 10 cm • record lengths and distances using the abbreviation for centimetres (cm) • compare lengths with the same standard unit

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Length **E2.3 measure and draw lengths in centimetres and metres, using a measuring tool, and recognize the impact of starting at points other than zero**				
Measure in metres and centimetres	Measuring in metres and centimetres	1	Measuring in metres and centimetres	• estimate and measure lengths and distances using metres and centimetres • explain strategies used to estimate lengths and distances, such as by referring to a known length, eg 'My handspan is 10 cm and my desk is 8 handspans long, so my desk is about 80 cm long' • record lengths and distances using abbreviations for metres and centimetres, eg 1 m 25 cm
Time **E2.4 use units of time, including seconds, minutes, hours, and non-standard units, to describe the duration of various events**				
Use units of time to describe duration	Measuring and estimating time using informal units	1	Measuring and estimating time using informal units	• estimate and measure the duration of an event using repeated informal units such as the number of times you can clap your hands • relate informal units of duration to seconds, minutes and hours using personal reference, eg a television program or a song
	Introducing formal units for time: hours	1	Introducing formal units for time: hours	• establish the need for formal units (hours) to measure time • identify situations where hours are an appropriate unit for measuring the duration of time • identify the relationship between half hours and hours • know that there are 24 hours in one day • introduce the abbreviation h to record time in hours • compare durations in hours
	Introducing formal units for time: minutes	1	Introducing formal units for time: minutes	• develop a sense of the duration of 1 minute by experiencing activities with this duration • identify situations where minutes are an appropriate unit for measuring the duration of time • establish the need for formal units (minutes) to measure time • identify the relationship between minutes and hours: know that 1 hour is 60 minutes;- that ½ hour is 30 minutes;- that a quarter of an hour is 15 minutes;- and that three-quarters of an hour is 45 minutes • read the time on digital clocks using the terms 'thirty' 'fifteen' 'forty-five' etc • connect the duration of 1 minute to the coordinated movements of the hands of an analog clock • introduce the abbreviation min to record time in minutes • compare and sequence durations in minutes

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Time E2.4 use units of time, including seconds, minutes, hours, and non-standard units, to describe the duration of various events				
Use units of time to describe duration	Introducing formal units for time: seconds	1	Introducing formal units for time: seconds	• develop a sense of the duration of a few seconds by experiencing activities with this duration • establish the need for formal units (seconds) to measure time • identify situations where seconds are an appropriate unit for measuring the duration of time • identify the relationship between minutes and seconds: know that 1 minutes is 60 seconds;- that ½ minute is 30 seconds • connect the duration of 1 minute to the coordinated movements of the hands of an analog clock • introduce the abbreviation s to record time in seconds • compare and sequence durations in seconds

Ontario Curriculum Grades 2

Understanding Practice and Fluency (UPF)

F. Financial Literacy

F1. Money and Finances - demonstrate an understanding of the value of Canadian currency

Quest	Learning Journey	Steps	Content	Detail
Money Concepts **F1.1 identify different ways of representing the same amount of money up to Canadian 200¢ using various combinations of coins, and up to $200 using various combinations of $1 and $2 coins and $5, $10, $20, $50, and $100 bills**				
Represent amounts of money	Using bills and coins to make amounts	1	Using bills and coins to make amounts | Canada	• determine the total amount of money by counting the value of bills of the same denomination • combine amounts of bills and coins to make a given amount of money shown in dollars and cents (no decimal point) • calculate the total value of a group of bills and coins and record this value in dollars and cents using the correct symbols (no decimal point) • generate and recognize different combinations of coins that have the same value (combining coins of the same denominations and different denominations) and record these using the symbol c • generate and recognize different combinations of bills that have the same value (combining bills of the same denominations and different denominations) and record these using the symbol $

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.1 read, represent, compose, and decompose whole numbers up to and including 1000, using a variety of tools and strategies, and describe various ways they are used in everyday life				
Numbers up to 1000	Reading and writing 3-digit numbers	1	Reading and writing 3-digit numbers using numbers only	• read a given 3-digit number in words, e.g., 456 says 'four hundred fifty-six' • write the numbers for a 3-digit number given verbally in words
		2	Reading and writing 3-digit numbers using words and numbers	• write a given 3-digit number in words, e.g., 456 as four hundred fifty-six • write the numbers for a 3-digit number given in words
		3	Representing 3-digit numbers using words, numbers, and objects	• model a given 3-digit number using concrete materials, pictures, or drawings • write the numbers and words, e.g., 'two hundred fifty-three' for a 3-digit number represented using place value manipulatives or using pictures and drawings
	Using place value to partition 3-digit numbers	1	Using place value to partition 3-digit numbers	• use place value equipment to partition a given 3-digit number into hundreds, tens and ones • describe a 3-digit number using words, eg 523 as '5 hundreds, 2 tens and 3 ones' • write a 3-digit number in expanded notation, eg 523 as 500 + 20 + 3 • write the numeral for a number represented by expanded notation • recognize zero as a placeholder
	Non-standard partitioning, 3-digit numbers	1	Partitioning 3-digit numbers using non-standard partitioning	• use place value equipment to partition a given 3-digit number using non-standard partitioning, eg 375 as 2 hundreds and 175 ones or 200 + 175 • model and identify a number from non-standard partitioning, eg recognize 3 hundreds, 4 tens and 27 ones or 300 + 40 + 27 as 367
Whole Numbers B1.2 compare and order whole numbers up to and including 1000, in various contexts				
Compare and order numbers to 1000	Comparing numbers to 1000	1	Comparing numbers to 1000	• model and compare two 3-digit numbers using place value equipment • compare two 3-digit numbers;- describe as 'more than' or 'less than', 'smaller than, greater than'
		2	Comparing numbers to 1000 using <, = and > symbols	• model and compare two 3-digit numbers using place value equipment • compare two 3-digit numerals using <, = and > symbols
	Ordering numbers to 1000	1	Ordering numbers to 1000	• order up to 4 consecutive numbers within 1000 in ascending order or descending order;- explain the reason for the order given • order up to 4 non-consecutive numbers within 1000 in ascending order;- explain the reason for the order given

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.3 round whole numbers to the nearest ten or hundred, in various contexts				
Round numbers up to 1000	Rounding numbers to the nearest ten	1	Rounding numbers up to 1000 to the nearest 10	• round numbers up to 1000 to the nearest 10
	Rounding numbers to the nearest hundred	1	Rounding numbers up to 1000 to the nearest 100	• model a 3-digit number and recognize which hundred it is nearer to; explain reasoning • round a 3-digit number to the nearest 100, recognize the digit in the tens column as the key digit
Whole Numbers B1.4 count to 1000, including by 50s, 100s, and 200s, using a variety of tools and strategies				
Count to 1000	Counting by 10s to 1000, forwards and backwards	1	Counting by skip counting forwards by 10s from any multiple of 10 to 1000	• use concrete materials, models, drawings, number lines/ charts to skip count forwards by 10s from any multiple of 10 up to 1000 • skip count forwards by 10s from any multiple of 10 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		2	Counting by skip counting forwards and backwards by 10s from any number up to 1000	• use concrete materials, models, drawings, number lines/ charts to skip count forwards or backwards by 10s from any number up to 1000 • skip count forwards or backwards by 10s from any number using understanding of the number sequence and place value • recognize an error in the skip counting sequence
	Counting by 2s to 1000, forwards and backwards	1	Counting by skip counting forwards by 2s from any multiple of 2 to 1000	• use concrete materials, models, drawings, number lines/ charts to skip count forwards by 2s from any multiple of 2 up to 1000 • skip count forwards by 2s from any multiple of 2 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		2	Counting by skip counting backwards by 2s from any multiple of 2 up to 1000	• use concrete materials, models, drawings, number lines/ charts to skip count backwards by 2s from any multiple of 2 up to 1000 • skip count backwards by 2s from any multiple of 2 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
	Counting by 5s to 1000, forwards and backwards	1	Counting by skip counting forwards by 5s from any multiple of 5 to 1,000	• use concrete materials, models, drawings, number lines/ charts to skip count forwards by 5s from any multiple of 5 up to 1,000 • skip count forwards by 5s from any multiple of 5 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
		2	Counting by skip counting forwards or backwards by 5s from any number up to 1000	• use concrete materials, models, drawings, number lines/ charts to skip count forwards or backwards by 5s from any number up to 1000 • skip count forwards or backwards by 5s from any multiple of 5 by memory and an understanding of the number sequence • recognize an error in the skip counting sequence

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.4 count to 1000, including by 50s, 100s, and 200s, using a variety of tools and strategies				
Count to 1000	Counting by 100s to 1000, forwards and backwards	1	Counting by skip counting forwards by 100s from any number up to 1,000	• use concrete materials, models, drawings, number lines/charts to skip count forwards by 100s from any number up to 1,000 • skip count forwards by 100s from any number using understanding of the number sequence and place value • recognize an error in the skip counting sequence
		2	Counting by skip counting backwards by 100s from any number within 1000	• use concrete materials, models, drawings, number lines/charts to skip count backwards by 100s from any number within 1000 • skip count backwards by 100s from any number by memory and an understanding of the number sequence • recognize an error in the skip counting sequence
	Counting by 20s to 1000, forwards and backwards	1	Counting by skip counting forwards or backwards by 20s from zero to 1000	• use concrete materials, models, drawings, number lines/charts to skip count forwards or backwards by 20s from zero to 1000 • skip count forwards or backwards by 20s using an understanding of the number sequence • recognize an error in the skip counting sequence
	Counting by 50s to 1000, forwards and backwards	1	Counting by skip counting forwards or backwards by 50s from zero to 1000	• use concrete materials, models, drawings, number lines/charts to skip count forwards or backwards by 50s from zero to 1000 • skip count forwards or backwards by 50s using an understanding of the number sequence • recognize an error in the skip counting sequence
	Counting by 200s to 1000, forwards and backwards	1	Counting by skip counting forwards or backwards by 200s from zero to 1000	• use concrete materials, models, drawings, number lines/charts to skip count forwards or backwards by 200s from zero to 1000 • skip count forwards or backwards by 200s using an understanding of the number sequence • recognize an error in the skip counting sequence
Whole Numbers B1.5 use place value when describing and representing multi-digit numbers in a variety of ways, including with base ten materials				
Place value to 1000	Identifying place value: 3-digit numbers	1	Identifying the place value of digits in 3-digit numbers	• write the number for a 3-digit number modeled using place value manipulatives • identify the digit in the hundreds, tens, or ones column for a given 3-digit number • recognize that the value of the digit is determined by its place value, e.g., in 689 the digit 8 has a place value of tens and a total value of 80 • identify, record, and model a number using place value clues, e.g., 'a 5 in the hundreds and a 2 in the ones' as 502 • recognize the role of zero as a placeholder • create the smallest and largest numbers possible using 3 digits

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers **B1.5 use place value when describing and representing multi-digit numbers in a variety of ways, including with base ten materials**				
Place value to 1000	Solving place value problems: 3-digit numbers	1	Solving problems using 3-digit numbers	• identify the smallest or largest number that can be made from 3 digits, e.g., given 1, 7 and 3, recognize that 731 is the largest number;- explain reasoning • identify a 3-digit number using given clues, e.g., 'the digit in the ones place is odd' or 'the number is between 500 and 700'
Fractions **B1.6 use drawings to represent, solve, and compare the results of fair-share problems that involve sharing up to 20 items among 2, 3, 4, 5, 6, 8, and 10 sharers, including problems that result in whole numbers, mixed numbers, and fractional amounts**				
Fair-share problems	Fair-share problems	1	Representing, solving and comparing the results of fair-share problems that involve sharing up to 20 items among 2, 3, 4, 5, 6, 8, and 10 sharers, including problems that result in whole numbers, mixed numbers and fractional amounts	• represent and solve fair-share problems that involve sharing up to 20 items among 2, 3, 4, 5, 6, 8, and 10 sharers with whole numbers results • represent and solve fair-share problems that involve sharing up to 20 items among 2, 3, 4, 5, 6, 8, and 10 sharers with fractional and mixed number results • compare the results of fair-share problems that involve sharing up to 20 items among 2, 3, 4, 5, 6, 8, and 10 sharers with whole numbers, mixed numbers and fractional amounts
Fractions **B1.7 represent and solve fair-share problems that focus on determining and using equivalent fractions, including problems that involve halves, fourths, and eighths; thirds and sixths; and fifths and tenths**				
Equivalent fraction fair-share problems	Equivalent fraction fair-share problems	1	Representing and solving fair-share problems that focus on determining and using equivalent fractions (denominators 2, 3, 4, 5, 6, 8, 10)	• represent and solve fair-share problems that focus on determining and using equivalent fractions (denominators 2, 3, 4, 5, 6, 8, 10)
	Investigating equivalent fractions	1	Investigating simple equivalent fractions less than 1 using concrete materials and/or models (denominators 2, 3, 4, 5, 6, 8, 10)	• use models such as number lines, fraction strips, fraction walls to identify equivalent fractions • use concrete materials or models to show equivalent fractions, eg folding a strip of paper

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Properties and Relationships B2.1 use the properties of operations, and the relationships between multiplication and division, to solve problems and check calculations				
Multiplication & division relationships	Properties of multiplication	1	Introducing the commutative property of multiplication	• use concrete materials or drawings of groups or arrays to model the commutative property, e.g., 3 groups of 2 is the same as 2 groups of 3 • explain the reason why the result is the same, eg, 'there are still the same number but they have been grouped differently' • explore the understanding that division problems are not commutative
		2	Using the commutative property of multiplication up to 10 x 10	• use the commutative property of multiplication, e.g., 7 x 9 = 9 x 7
		3	Using the associative property of multiplication up to 10 x 10	• use the associative property of multiplication up to 10 x 10
		4	Using the distributive property up to 10 x 10	• use the distributive property up to 10 x 10
	Understanding division, unknown-factor problem	1	Understanding division as an unknown-factor problem	• understand division as an unknown-factor problem
	Modelling multiplication & division relationships	1	Modelling the relationship between multiplication and division	• use reversing to rewrite division statements as multiplication statements
Math Facts B2.2 recall and demonstrate multiplication facts of 2, 5, and 10, and related division facts				
Multiplication/ division facts: 2, 5, 10	Multiplication facts: 2	1	Recalling multiplication facts for 2	• recall the 2 multiplication facts
	Multiplication facts: 5	1	Recalling multiplication facts for 5	• recall the 5 multiplication facts
	Multiplication facts: 10	1	Recalling the multiplication facts for 10	• recall the 10 multiplication facts
	Division facts: 2	1	Recalling the division facts for 2	• recall the division facts for 2
	Division facts: 5	1	Recalling the division facts for 5	• recall the division facts for 5
	Division facts: 10	1	Recalling the division facts for 10	• recall the division facts for 10

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Mental Math **B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 1000, and explain the strategies used**				
Mental math: add/subtract to 1000	Add 2-/3-digit numbers mentally, place value	1	Adding 2-digit and 3-digit numbers mentally using place value understanding (jump strategy)	• mentally solve addition problems involving 2-digit and 3-digit numbers using a jump strategy, eg 823 + 56 as 823 + 50 = 873, 873 + 6 = 879 • record and explain the use of the strategy • check calculations using the inverse operation
	Subtract 2-/3-digit numbers mentally, place value	1	Subtracting a 2-digit number from a 3-digit number mentally using place value understanding (jump strategy)	• mentally solve subtraction problems involving 2-digit and 3- digit numbers using place value partitioning, eg 823 − 56 as 823 − 50 = 773, 773 − 6 = 767 • record and explain the use of the strategy • check calculations using the inverse operation
	Add and subtract 2-/3-digit number, place value	1	Adding and subtracting a 2-digit and 3-digit number mentally using place value understanding (jump strategy)	• mentally solve addition and subtraction problems involving 2-digit and 3- digit numbers using place value partitioning, eg 823 − 56 as 823 − 50 = 773, 773 − 6 = 767
	Subtract two 3-digit numbers mentally, place value	1	Subtracting two 3-digit numbers mentally using place value understanding (split strategy)	• solve subtraction problems using a split strategy, eg 548 − 127 as 500 − 100 and 40 − 20 and 8 − 7, 400 + 20 + 1 = 421 • record and explain the strategy using numerals, models and/or diagrams
	Estimation: addition/ subtraction	1	Estimating additions	• round numbers to the nearest multiple of 100 to estimate additions, eg 546 + 789 as 500 + 800 • round numbers to the nearest multiple of 10 or 100 to estimate additions, eg 546 + 789 as 540 + 800 • explain the reason for the estimation used and whether the estimation is higher or lower than the actual answer
		2	Estimating subtractions	• round numbers to the nearest multiple of 100 to estimate subtractions, eg 546 − 189 as 500 − 200 • round numbers to the nearest multiple of 10 or 100 to estimate subtractions, eg 746 − 389 as 740 − 400 • explain the reason for the estimation used and whether the estimation is higher or lower than the actual answer

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.4 demonstrate an understanding of algorithms for adding and subtracting whole numbers by making connections to and describing the way other tools and strategies are used to add and subtract**				
Addition and Subtraction **B2.5 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 1000, using various tools and algorithms**				
Add and subtract within 1000	Create/solve addition & subtraction word problems	1	Creating and solving addition and subtraction word problems (within 1000)	• represent a word problem as an addition or subtraction number sentence • solve simple addition and subtraction word problems in context including find the difference, find the sum, change unknown, start unknown • explain and compare strategies used to solve addition and subtraction word problems • create problems in contexts that involve addition and subtraction
	Add/subtract using the number line	1	Adding 2-digit and 3-digit numbers using place value partitioning on a number line (jump strategy)	• model and solve the addition of a 2-digit and 3-digit number using an empty number line, eg 823 + 56 as 823 + 50 = 873, 873 + 6 = 879
		2	Subtracting a 2-digit number from a 3-digit number using place value partitioning on a number line (jump strategy)	• model and solve the subtraction of a 2-digit number from a 3-digit number using an empty number line, eg 823 − 56 as 823 − 50 = 773, 773 − 6 = 767
		3	Adding and subtracting a 2-digit and 3-digit number using place value partitioning on a number line (jump strategy)	• model and solve the addition or subtraction of a 2-digit number from a 3-digit number using an empty number line, eg 823 − 56 as 823 − 50 = 773, 773 − 6 = 767
	Add/subtract using place value	1	Adding a 2-digit and 3-digit number using place value models (split strategy)	• model the addition of a 2-digit and 3-digit number using a split strategy with or without crossing tens;- use place value manipulatives, money, or diagrams • solve addition problems using a split strategy, e.g., 265 + 27 as 260 + 20 and 5 + 7, 280 + 12 = 292 • record and explain the use of the strategy
		2	Subtracting a 2-digit number from a 3-digit number using place value models (split strategy)	• model the subtraction of a 2-digit and 3-digit number using a split strategy;- place value equipment, money or diagrams • solve subtraction problems using a split strategy, eg 265 − 21 as 260 − 20 and 5 − 1, 240 + 4 = 244 • record and explain the use of the strategy
		3	Adding and subtracting 2-digit and 3-digit numbers using place value models (split strategy)	• model the addition or subtraction of a 2-digit and 3-digit number using a split strategy;- place value equipment, money or diagrams • solve addition and subtraction problems using a split strategy, eg 265 − 21 as 260 − 20 and 5 − 1, 240 + 4 = 244 • record and explain the strategy using numerals, models and/or diagrams • check calculations using the inverse operation

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.5 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 1000, using various tools and algorithms**				
Add and subtract within 1000	Add/subtract using rounding and compensating	1	Introducing addition using rounding and compensating when the change or start is unknown	• model with number lines and solve addition problems with two 2-digit numbers where the digits in the ones column for the known addend and result are close together, e.g., 23 + ? = 81 becomes 23 + 60 − 2 • explain and justify the use of the strategy
		2	Adding up to two 3-digit numbers using rounding and compensating	• add up to two 3-digit numbers where 1 number is close to a hundred (ends in 97, 98 or 99) • round 1 number to the next 100, carry out the addition and adjust the answer to compensate for the original rounding, eg 398 + 23 as 400 + 23 − 2 • record the strategy using numerals, models and/or diagrams and explain the need to compensate
		3	Subtracting up to two 3-digit numbers using rounding and compensating	• subtract up to two 3-digit numbers where 1 number is close to a hundred (ends in 97, 98 or 99) • round 1 number to the next 100, carry out the subtraction and adjust the answer to compensate for the original rounding, eg 398 − 23 as 400 − 23 + 2 • record the strategy using numerals, models and/or diagrams and explain the need to compensate
		4	Adding and subtracting up to two 3-digit numbers using rounding and compensating	• add or subtract up to two 3-digit numbers where 1 number is close to a hundred (ends in 97, 98 or 99) • round 1 number to the next 100, carry out the addition or subtraction and adjust the answer to compensate for the original rounding, eg 398 + 23 as 400 + 23 − 2
	Add/subtract using expanded form	1	Introducing the addition of two 2-digit numbers using an expanded form of the written method	• solve the addition of two 2-digit numbers represented vertically using place value partitioning and an expanded form of the written method
		2	Introducing the subtraction of two 2-digit numbers using an expanded form of the written method	• solve the subtraction of two 2-digit numbers represented vertically using place value partitioning and an expanded form of the written method

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.5 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 1000, using various tools and algorithms**				
Add and subtract within 1000	Represent add/subtract problems using a bar model	1	Representing addition problems using a bar model (within 1000)	• represent an addition problem where the result is unknown, eg 'Anna had 58 marbles. Sam gave her 27 more. How many marbles does Anna have now?' • represent addition problems where the change or part is unknown, eg 'Anna has 58 marbles, how many more does she need to have 73? or Anna had 53 marbles. 17 were yellow. How many were red?' • represent addition problems where the start is unknown, eg 'Anna had some marbles. Sam gave her 17 more. Now she has 53. How many did she have to start with?' • solve addition problems represented on a bar model using efficient mental strategies
		2	Representing subtraction problems using a bar model (within 1000)	• represent subtraction problems where the result is unknown, eg 'Anna had 52 marbles. She gave 17 to Sam. How many marbles does she have left?' • represent and solve subtraction problems where the change is unknown, eg 'Anna had 52 marbles. She gave some to Sam. Now she has 15 left. How many marbles did she give to Sam?' • represent and solve subtraction problems where the start is unknown, eg 'Anna gave 27 marbles to Sam. Now she has 5 marbles left. How many marbles did Anna begin with?' • solve subtraction problems represented on a bar model using efficient mental strategies
		3	Representing comparison problems using a bar model (within 1000)	• represent and solve comparison problems where the difference is unknown, eg 'Anna has 13 plums. Sam has 7 plums. How many more plums does Anna have?' • represent and solve comparison problems where the referent is unknown, eg 'Anna has 43 marbles. She has 17 more than Sam. How many marbles does Sam have?' • represent and solve subtraction problems where the comparison quantity is unknown, eg 'Sam has 17 marbles. Anna has 35 more marbles. How many marbles does Anna have?' • solve comparison problems represented on a bar model using efficient mental strategies

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction B2.5 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 1000, using various tools and algorithms				
Add and subtract within 1000	Add/subtract using an algorithm	1	Using a formal written algorithm for addition calculations up to three-digit numbers (no regrouping)	• apply algorithms to solve problems without regrouping, with the same number of places and with a different number of places • use estimation or reverse operation to check the reasonableness of solutions
		2	Using a formal written algorithm for addition calculations up to three-digit numbers (with regrouping)	• apply algorithms to solve problems with regrouping in 1 or more places, with the same number of places and with a different number of places;- include opportunities for students to write their own algorithms with digits in correct place value positions;- include word problems • use estimation or reverse operation to check the reasonableness of solutions
		3	Using a formal written algorithm to record subtraction calculations involving up to three-digit numbers (without decomposing)	• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend);- include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first;- include word problems • use estimation or reverse operation to check the reasonableness of solutions
		4	Using a formal written algorithm to record subtraction calculations involving up to three-digit numbers (with decomposing)	• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend);- include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first;- include word problems • use estimation or reverse operation to check the reasonableness of solutions

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.6 represent multiplication of numbers up to 10 × 10 and division up to 100 ÷ 10, using a variety of tools and drawings, including arrays				
Represent multiplication/ division to 100	Introducing and describing arrays	1	Introducing and describing arrays	• describe simple multiplication problems represented in arrays using '_ groups of _' and use 'rows' and 'columns' to describe the parts of the array • represent simple multiplication problems using arrays (concrete materials, pictures, or diagrams) • recognize and describe practical examples of arrays, eg, seedling trays, seating arrangements
	Using arrays to add or subtract another group	1	Using arrays to add or subtract another group	• model the array for a given multiplication fact and identify the impact of adding 1 row or group, e.g., 4 x 5 = 20 so 5 x 5 must be 20 + 5 • model the array for a given multiplication fact and identify the impact of removing 1 row, or group, e.g., 4 x 5 = 20 so 3 x 5 must be 20 − 5
	Representing multiplication up to 10 × 10, models	1	Representing multiplication up to 10 × 10, using a variety of tools and drawings, including arrays	• represent multiplication up to 10 × 10, using a variety of tools and drawings, including arrays
	Representing division up to 100 ÷ 10, models	1	Representing division up to 100 ÷ 10, using a variety of tools and drawings, including arrays	• represent division up to 100 ÷ 10, using a variety of tools and drawings, including arrays
Multiplication and Division B2.7 represent and solve problems involving multiplication and division, including problems that involve groups of one half, one fourth, and one third, using tools and drawings				
Solve multiplication/ division problems	Use repeated addition to multiply	1	Using repeated addition to multiply	• recognize and describe the relationship between, eg, 3 groups of 4 as 4 + 4 + 4 • use empty number lines and number charts to help solve multiplication problems using repeated addition (2s, 5s, 10s, 3s, 4s) • explore the use of repeated addition to count in practical situations • apply known facts, such as doubles, to repeated addition problems, e.g., 5 + 5 + 5 + 5 as 10 + 10

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.7 represent and solve problems involving multiplication and division, including problems that involve groups of one half, one fourth, and one third, using tools and drawings				
Solve multiplication/ division problems	Divide by sharing and grouping	1	Dividing by sharing (up to 50)	• model and solve division problems by equally sharing a collection into a given number of groups or number of columns/rows in an array • record answers to division problems using drawings, words and numerals;- complete stem sentences eg 'when _ is shared into _ equal groups there are _ in each group' • describe any parts left over when the collection is not able to be equally shared
		2	Dividing by grouping (up to 50)	• model and solve division problems sharing a collection of objects into groups of a given size, and by arranging it into rows or columns of a given size in an array, eg determine the number of columns in an array when 20 objects are arranged into rows of 4 • record answers to division problems using drawings, words and numerals;- complete stem sentences, eg 'when _ is shared into _ equal groups there are _ in each group' • describe an parts left over when the collection is not able to be equally shared
	Create/solve problems, sharing and grouping	1	Creating and solving problems using grouping and sharing up to 5 x 5 (equal groups)	• create and solve problems in context using and grouping and sharing of equal groups • explain and compare methods of solving
	Use repeated subtraction to divide	1	Using repeated subtraction to divide	• solve division problems (group size known, number of groups unknown) using repeated subtraction and concrete materials, models or drawings of groups or arrays • use an empty number line or number chart to represent division problems as repeated subtraction (group size known ... number of groups unknown) • explore the use of repeated subtraction in practical situations
	Multiply/divide, models (2x, 5x, 10x)	1	Solving simple multiplication and division problems using models and manipulatives (2x, 5x, 10x)	• recognize a simple word problem as a division or multiplication problem • select and use a strategy to solve a multiplication or division problem, using concrete materials, drawings, number lines/charts for support • describe and explain the strategy used, e.g., skip counting or repeated subtraction • record answers to multiplication and division problems using drawings, words and numbers, e.g., '2 rows of 5 is 10'

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division **B2.7 represent and solve problems involving multiplication and division, including problems that involve groups of one half, one fourth, and one third, using tools and drawings**				
Solve multiplication/ division problems	Solve multiplication problems, sharing/ grouping	1	Solving multiplication problems using fair shares or equal grouping (within 100)	• solve fair share multiplication or division problems (with unknown in any position), eg '20 flowers are to be placed in 4 bunches, how many flowers will be in each bunch?' • solve equal grouping multiplication or division problems (with unknown in any position), eg 'There are 9 tables in a cafeteria. Each table has 5 chairs. What is the total number of chairs in the cafeteria?' • write equations using a symbol, eg a box or a blank, to represent the unknown number • compare their own and others' methods of solution
	Solve multiplication/ division problems, arrays	1	Solving multiplication and division problems involving arrays (within 100)	• solve multiplication and division problems (with the unknown in any position) involving arrays, eg 'A rectangular egg carton has 3 rows and 4 columns of eggs. How many eggs are there?' • write equations using a symbol, eg a box or a blank, to represent the unknown number • compare their own and others' methods of solution
	Repeated addition/ subtraction, unit fractions	1	Using repeated addition or subtraction to represent and solve multiplication and division problems involving groups of one half, one fourth, and one third (with models)	• use repeated addition or subtraction to represent and solve multiplication and division problems involving groups of one half, one fourth, and one third (with models)
Multiplication and Division **B2.8 represent the connection between the numerator of a fraction and the repeated addition of the unit fraction with the same denominator using various tools and drawings, and standard fractional notation**				
Understand the numerator	Using models to add unit fractions	1	Using models to add unit fractions with the same denominator (denominators 2, 3, 4, 5, 6, 8, 10)	• use models to add unit fractions with the same denominator (denominators 2, 3, 4, 5, 6, 8, 10)
Multiplication and Division **B2.9 use the ratios of 1 to 2, 1 to 5, and 1 to 10 to scale up numbers and to solve problems**				
Use ratios to scale up numbers	Using ratios to scale up numbers with models	1	Using ratios to scale up numbers (1:2, 1:5, 1:10), with models	• use ratios to scale up numbers (1:2, 1:5, 1:10), with model

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.1 identify and describe repeating elements and operations in a variety of patterns, including patterns found in real-life contexts**				
Identify/ describe repeating patterns	Identify/ describe repeating number patterns	1	Identifying, extending and describing repeating numeric patterns	• identify and extend through investigation, numeric repeating patterns, eg 1, 2, 1, 2, 1, 2, • describe numeric repeating patterns
Patterns **C1.2 create and translate patterns that have repeating elements, movements, or operations using various representations, including shapes, numbers, and tables of values**				
Create repeating patterns	Creating repeating patterns using given attributes	1	Creating repeating patterns using a given criteria, eg using 3 colours and 2 shapes	• predict the next element in a repeating element;- justify
	Identifying and creating number patterns	1	Identifying and creating additive number patterns (3s, 4s, 6s, 7s, 8s, 9s, from any starting point within 100)	• identify additive number patterns, eg, patterns that increase in 3s, 4s, 6s, 7s, 8s, and 9s from any starting point • describe the rule for an additive number pattern, eg, 'It goes up by 3s' • continue and create an additive number pattern
		2	Identifying and creating subtractive number patterns (3s, 4s, 6s, 7s, 8s, 9s, from any starting point within 100)	• identify subtractive number patterns, eg, patterns that decrease by 3s, 4s, 6s, 7s, 8s, and 9s from any starting point • describe the rule for a subtractive number pattern, e.g., 'It goes down by 3s' • continue and create a subtractive number pattern represented in numbers, on a number line, or expressed in words, e.g., 'make a pattern that starts at 20 and shrinks by subtracting 2 each time'
		3	Identifying and creating additive and subtractive number patterns (3s, 4s, 6s, 7s, 8s, 9s, from any starting point within 100)	• identify additive or subtractive number patterns on a number line, hundreds chart, or calendar, e.g., patterns that increase in 3s, 4s, 6s, 7s, 8s, and 9s from any starting point • describe the rule for an additive or subtractive number pattern, e.g., 'It goes up by 3s' • continue and create an additive or subtractive number pattern represented in numbers, on a number line, or expressed in words, e.g., 'make a pattern that starts at 0 and grows by adding 7 each time'

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns that have repeating elements, movements, or operations**				
Create/extend/ describe repeating pattern	Creating/ extending/ describing repeating patterns	1	Creating, extending and describing repeating patterns	• extend and describe repeating patterns involving more than 1 attribute change, eg transformation and size • predict the next element in the a repeating element;- justify
Patterns **C1.4 create and describe patterns to illustrate relationships among whole numbers up to 1000**				
Describe patterns in numbers to 1000	Describing/ recognizing patterns in numbers to 1000	1	Identifying and describing additive, subtractive or multiplicative number patterns on charts and number lines up to 1000	• identify number patterns on number lines, calendars, or hundreds charts , eg the multiples of 3 appear diagonally in a hundreds chart
		2	Recognizing patterns with 1 operation involving addition, subtraction, or multiplication (doubling) up to 1000	• identify patterns with involving addition, subtraction, or multiplication on a number line, hundreds chart, or calendar • describe the rule for a number pattern, e.g., 'It goes up by 3s', or 'it doubles each time'
Patterns **C1.4 create and describe patterns to illustrate relationships among whole numbers up to 1000**				
Describe patterns in numbers to 1000	Describing/ recognizing patterns in numbers to 1000	1	Identifying and describing additive, subtractive or multiplicative number patterns on charts and number lines up to 1000	• identify number patterns on number lines, calendars, or hundreds charts , eg the multiples of 3 appear diagonally in a hundreds chart
		2	Recognizing patterns with 1 operation involving addition, subtraction, or multiplication (doubling) up to 1000	• identify patterns with involving addition, subtraction, or multiplication on a number line, hundreds chart, or calendar • describe the rule for a number pattern, e.g., 'It goes up by 3s', or 'it doubles each time'

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Variables **C2.1 describe how variables are used, and use them in various contexts as appropriate**				
Equalities and Inequalities **C2.2 determine whether given sets of addition, subtraction, multiplication, and division expressions are equivalent or not**				
Recognize equivalent expressions	Recognizing equivalent expressions, 4 operations	1	Recognizing equivalent expressions, 4 operations	• determine whether given sets of addition expressions are equivalent or not using symbols (within 1000) • determine whether given sets of subtraction expressions are equivalent or not using symbols (within 1000) • determine whether given sets of multiplication expressions are equivalent or not using symbols (within 10 x 10) • determine whether given sets of division expressions are equivalent or not using symbols (within 100 ÷ 10)
Equalities and Inequalities **C2.3 identify and use equivalent relationships for whole numbers up to 1000, in various contexts**				
Use equivalent relationships to 1000	Using equivalent relationships to 1000	1	Using equivalent relationships to balance number sentences, 4 operations	• complete number sentences involving addition by calculating missing numbers (within 1000) • complete number sentences involving subtraction by calculating missing numbers (within 1000) • complete number sentences involving multiplication by calculating missing numbers (within 10 x 10) • complete number sentences involving division by calculating missing numbers (within 100 ÷ 10)

C3. Coding - solve problems and create computational representations of mathematical situations using coding concepts and skills

Quest	Learning Journey	Steps	Content	Detail
Coding Skills **C3.1 solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, and repeating events**				
Write code for different types of events	Write code for different types of events	1	Creating computational representations of real-life situations that involve sequential, concurrent and repeating events	• create computational representations of real-life situations that involve sequential, concurrent and repeating events
		2	Using computational representations of real-life situations that involve sequential, concurrent and repeating events	• use computational representations of real-life situations that involve sequential, concurrent and repeating events
		3	Creating computational representations of mathematical situations using pseudocode that involves sequential, concurrent and repeating events	• create computational representations of mathematical situations by writing code, including code that involves sequential, concurrent and repeating events

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

C. Algebra

C3. Coding - solve problems and create computational representations of mathematical situations using coding concepts and skills

Quest	Learning Journey	Steps	Content	Detail
Coding Skills C3.2 read and alter existing code, including code that involves sequential, concurrent, and repeating events, and describe how changes to the code affect the outcomes				
Read code for different types of events	Read code for different types of events	1	Reading existing code, including code that involves sequential, concurrent and repeating events, and describe how changes to the code affect the outcomes	
		2	Identifying and correcting errors in an algorithm	
		3	Exploring computational representations of mathematical situations	

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Collection and Organization D1.1 sort sets of data about people or things according to two and three attributes, using tables and logic diagrams, including Venn, Carroll, and tree diagrams, as appropriate				
Sort data according to 2–3 attributes	Carroll and Venn diagrams	1	Introducing Venn diagrams	• group data according to physical attributes given • explain why a certain piece of data has been put in each area of the Venn diagram • identify physical attributes to sort data by • look at sorted data and identify the physical attributes by which they have been sorted
		2	Relating Carroll and Venn diagrams	• understand the link between each area of a Venn diagram and a Carroll diagram • group data according to physical attributes given • explain why a certain piece of data has been put in each area of the Carroll diagrams • identify physical attributes to sort data by • look at sorted data and identify the physical attributes by which they have been sorted
	Tree diagrams	1	Constructing tree diagrams	• construct a tree diagram to show all possible combinations or outcomes for 2 or more independent events
	Sorting data in logic diagrams	1	Sorting sets of data about people or things according to 2 and 3 attributes using logic diagrams	• sort sets of data about people or things according to 2 and 3 attributes using logic diagrams
Data Collection and Organization D1.2 collect data through observations, experiments, and interviews to answer questions of interest that focus on qualitative and quantitative data, and organize the data using frequency tables				
Collect and organize data in tables	Collecting and organizing data in tables	1	Collecting and recording category data in tables	• create a list of categories for efficient data collection and present in a table format, e.g., 'Which sport is the most popular with members of our class?' • sort data from a simple survey and create a list or table to organize the data, e.g., sort data on the number of children in a class. • determine which data should be collected and presented in the table

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Visualization **D1.3 display sets of data, using many-to-one correspondence, in pictographs and bar graphs with proper sources, titles, and labels, and appropriate scales**				
Graphs: pictographs, bar graphs	Bar graphs, many-to-one correspondence	1	Representing data in bar graphs using many-to-one correspondence	• represent given or collected categorical data in bar graphs • discuss and determine a suitable scale of many-to-one correspondence to draw graphs for large data sets and state the key used • use grid paper to assist in drawing graphs that represent data using a scale of many-to-one correspondence • use data in a spreadsheet to create bar graphs with appropriately labelled axes • mark equal spaces on axes, name and label axes, and choose appropriate titles for graphs • interpret data in bar graph; ask and answer questions related to the data in the display; draw conclusion
	Pictographs, many-to-one correspondence	1	Representing data in pictographs using many-to-one correspondence	• represent given or collected categorical data in pictographs • discuss and determine a suitable scale of many-to-one correspondence to draw graphs for large data sets and state the key used • use grid paper to assist in drawing graphs that represent data using a scale of many-to-one correspondence • mark equal spaces on axes, name and label axes, and choose appropriate titles for graphs • interpret data in a pictograph; ask and answer questions related to the data in the display; draw conclusions
Data Analysis **D1.4 determine the mean 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 and mode	Determining and explaining the mean	1	Understanding the mean	• explore a set of values in data displays and in lists with the aim of summarizing all of the values with a single number • calculate the mean for a small set of data that would produce a whole number • use the mean to describe the shape of the data set across its range of values, using charts, tables, and graphs (eg, 'The data values fall mainly into two groups on both sides of the mean.';- 'The set of data is not spread out evenly around the mean.') • decide if the mean is the best representative number for the centre of the data set;- justify and discuss
		2	Calculating the mean	• calculate the mean for a small set of data
	Determining and explaining the mode	1	Understanding the mode	• explore a set of values in data displays and in lists with the aim of summarizing all of the values with a single number • organize values in order and find the value that is occurs the most • decide if the mode is the best representative number for centre of the data set;- justify and discuss
		2	Calculating the mode	• organize values in order and find the value that is occurs the most

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Analysis **D1.5 analyze different sets of data presented in various ways, including in frequency tables and in graphs with different scales, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions**				
Analyze data, various data displays	Analyzing data in pictographs, different scales	1	Reading data in a pictograph with a scale of 1, 2, 5, or 10	• ask and answer one step and two step questions, e.g., 'how many more students like reading than art?' • make conclusions about data presented in a bar graph, e.g., 'Football is the most popular sport for students in Year 3 at our school' • compare bar graphs with pictograph • evaluate simple statements made by others relating to data in a pictograph
	Analyzing data in bar graphs, different scales	1	Reading data in a bar graph with a scale of 1, 2, 5, or 10	• ask and answer one-step and two-step questions, e.g., 'How many more students like reading than art?' • make conclusions about data presented in a bar graph, e.g., 'Football is the most popular sport for students in Year 3 at our school' • compare bar graphs with pictographs • evaluate simple statements made by others relating to data in a bar graph
	Analyzing data in tables and lists	1	Reading secondary data displayed in tables or lists	• describe secondary data displayed in simple tables and lists, eg found in books and/or created by other students;- pose and answer one-step and two-step questions;- compare categories;- make simple conclusions

D2. Probability - describe the likelihood that events will happen, and use that information to make predictions

Quest	Learning Journey	Steps	Content	Detail
Probability **D2.1 use mathematical language, including the terms “impossible”, “unlikely”, “equally likely”, “likely”, and “certain”, to describe the likelihood of events happening, and use that likelihood to make predictions and informed decisions**				
Use the language of probability	Using the language of probability	1	Using the basic language of probability: impossible, unlikely, less likely, equally likely, more likely, certain	• Identify practical activities and everyday events that involve chance, eg 'I might or might not win the game' • make predictions about what might happen when discussing practical activities and everyday events that involve chance • describe outcomes in everyday activities and events as being 'impossible', 'unlikely', 'less likely', 'equally likely', 'more likely', 'certain'

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

D. Data

D2. Probability - describe the likelihood that events will happen, and use that information to make predictions

Quest	Learning Journey	Steps	Content	Detail
Probability D2.2 make and test predictions about the likelihood that the mean and the mode(s) of a data set will be the same for data collected from different populations				

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Geometric Reasoning E1.1 sort, construct, and identify cubes, prisms, pyramids, cylinders, and cones by comparing their faces, edges, vertices, and angles				
Three-dimensional objects	Introducing cones	1	Introducing cones	• recognize cones in the environment and drawings, including different orientations • manipulate and describe cones as having 1 flat surface and 1 curved surface • select cones from other three-dimensional objects using a description, '1 flat surface and 1 curved surface';- name the shape
	Introducing cubes	1	Introducing cubes	• recognize cubes in the environment and drawings, including different orientations • manipulate and describe cubes as having square faces • select cubes from other three-dimensional objects using a description, e.g., '6 square faces';- name the shape
	Introducing cylinders	1	Introducing cylinders	• recognize cylinders in the environment and drawings, including different orientations • manipulate and describe cylinders as having 2 flat surfaces and 1 curved surface • select cylinder from other three-dimensional objects using a description, e.g., '2 flat surfaces and 1 curved surface', name the shape
	Introducing prisms	1	Introducing prisms	• recognize prisms in the environment and drawings, including different orientations • manipulate and describe prisms as having identical bases and rectangular faces • select prisms from other three-dimensional objects using a description, e.g., 'rectangular faces';- name the shape (as prism only)
	Introducing pyramids	1	Introducing pyramids	• recognize pyramids in the environment and drawings • select pyramids from other three-dimensional objects using a description, '1 square face, 4 triangular faces';- name the shape (pyramid only — no need for specific pyramid names)
	Comparing, sorting, and naming prisms and pyramids	1	Comparing, sorting and naming prisms and pyramids	• compare and sort prisms and pyramids by their geometric properties, eg number of edges, number of vertices • describe and name prisms and pyramids by the shape of their base
	Making basic models of three-dimensional objects	1	Making basic models of three-dimensional objects	• use a variety of materials to make models of prisms (including cubes), pyramids, cylinders, cones and spheres, given a three-dimensional object, picture or photograph to view • identify and describe the two-dimensional shapes that can be found in a three-dimensional object, eg build a structure using concrete materials and describe it using geometric terms so that a partner will be able to build it

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Geometric Reasoning **E1.1 sort, construct, and identify cubes, prisms, pyramids, cylinders, and cones by comparing their faces, edges, vertices, and angles**				
Three-dimensional objects	Faces, edges, and vertices	1	Introducing faces	• manipulate three-dimensional objects and recognize that faces are flat surfaces with straight edges • identify and describe the number and shape of faces on a cube, rectangular prism or triangular prism • select a three-dimensional object from a description of its faces, e.g., '6 square faces'
		2	Introducing edges on three-dimensional objects	• trace around the face of a three-dimensional object onto paper;- describe the shape of the edges, e.g., '1 round edge' or '4 straight edges' • manipulate and describe the edges of basic three-dimensional objects;- recognize that a sphere has no edges • identify and count the edges on everyday objects and cones, cylinders, prisms, spheres and cubes
		3	Introducing vertices on three-dimensional objects	• manipulate and describe the vertices of basic three-dimensional objects;- recognize that a sphere has no vertices • recognize that a vertex is the point where 2 lines meet • identify and count the vertices on everyday objects and cones, cylinders, prisms, spheres and cubes
		4	Identifying faces, edges, vertices of cones, cubes, prisms, cylinders and spheres	• manipulate and describe the faces, edges and vertices of basic three-dimensional objects • identify and count the faces, edges and vertices on everyday objects and cones, cylinders, prisms, spheres and cubes
	Sorting three-dimensional objects	1	Sorting three-dimensional objects (cubes, prisms, pyramids, spheres, cylinders)	• sort three-dimensional objects according to particular attributes, eg the shape of the surfaces or number of edges
	Comparing three-dimensional objects	1	Comparing three-dimensional objects including pyramids, prisms, cones, spheres, and cylinders	• describe similarities and differences between prisms (including cubes), pyramids, cylinders, cones and spheres, e.g., surfaces, faces, edges, and vertices • recognize and describe the use of three-dimensional objects in a variety of contexts, e.g., buildings, packaging • identify and name three-dimensional objects as prisms (including cubes), pyramids, cylinders, cones and spheres

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Geometric Reasoning **E1.2 compose and decompose various structures, and identify the two-dimensional shapes and three-dimensional objects that these structures contain**				
Geometric Reasoning **E1.3 identify congruent lengths, angles, and faces of three-dimensional objects by mentally and physically matching them, and determine if the objects are congruent**				
Identify congruency in 3D objects	Identifying congruency in 3D objects	1	Identifying congruent lengths, angles, and faces of 3D objects by mentally and physically matching them and determine if the objects are congruent	• identify congruent lengths, angles, and faces of 3D objects by mentally and physically matching them • determine if 3D objects with congruent lengths, angles, and faces are congruent
Location and Movement **E1.4 give and follow multistep instructions involving movement from one location to another, including distances and half- and quarter-turns**				
Give and follow multistep instructions	Following instructions	1	Moving between two locations	• follow a sequence of directions, involving changes of direction from to left and right, to move themselves between 2 locations
		2	Following given directions to move between locations	• follow directions to move themselves between 2 locations
		3	Following given directions	• follow directions to position an object in a structure or picture
		4	Following pathways on simple maps	• follow and draw a path on a simple map given directions that use landmarks and directional language
	Giving instructions	1	Giving directions	• give directions to another person to place themselves in a specific location • give directions to another person to place an object in a specific location

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Length, Mass, and Capacity E2.1 use appropriate units of length to estimate, measure, and compare the perimeters of polygons and curved shapes, and construct polygons with a given perimeter				
Perimeter: polyons and curved shapes	Introducing perimeter	1	Introducing perimeter	• use the term 'perimeter' to describe the total distance around a two-dimensional shape • estimate and measure the perimeters of two-dimensional shapes • describe when a perimeter measurement might be used in everyday situations
	Calculating the perimeters of regular polygons	1	Calculating the perimeters of regular polygons	• explain the relationship between the lengths of the sides and the perimeters for polygons (including equilateral triangles and squares) • record calculations used to find the perimeters of two-dimensional shapes • find the length of 1 unknown side of a shape given the perimeter
Length, Mass, and Capacity E2.2 explain the relationships between millimetres, centimetres, metres, and kilometres as metric units of length, and use benchmarks for these units to estimate lengths				
Length: mm, cm, m, km	Introducing formal units for length: millimetres	1	Introducing formal units for length: millimetres	• recognize the need for a formal unit smaller than the centimetre to measure length • develop a personal reference for the approximate length of 1 mm • recognize and model that there are 10 mm in 1 cm, i.e., 10 mm = 1 cm • estimate and use the millimetre as a unit to measure lengths to the nearest millimetre using a ruler • record lengths using the abbreviation for millimetres (mm), e.g., 5 cm 3 mm or 53 mm • compare lengths with the same standard unit
	Introducing formal units for length: kilometres	1	Introducing formal units for length: kilometres	• recognize the need for a formal unit longer than the metre for measuring distance, eg distance between known places or visible landmarks • recognize that there are 1000 m in 1 km, ie 1000 m = 1 km • describe 1 m as one thousandth of a kilometre • develop a personal reference for the approximate length of 1 km and half a kilometre • record distances using the abbreviation for kilometres (km)
	Metres and centimetres	1	Measuring in metres and centimetres	• estimate and measure lengths and distances using metres and centimetres • explain strategies used to estimate lengths and distances, such as by referring to a known length, eg 'My handspan is 10 cm and my desk is 8 handspans long, so my desk is about 80 cm long' • record lengths and distances using abbreviations for metres and centimetres, eg 1 m 25 cm

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Length, Mass, and Capacity **E2.3 use non-standard units appropriately to estimate, measure, and compare capacity, and explain the effect that overfilling or underfilling, and gaps between units, have on accuracy**				
Capacity: non-standard units	Comparing and ordering capacity	1	Comparing and ordering capacities using an informal measuring tool	• make and use a measuring device for measuring capacity calibrated in uniform informal units, eg calibrate a bottle by adding cups of water and marking the new level as each cup is added • compare and order capacities by measuring with an informal measuring tool • record capacity comparisons informally using drawings, numerals and words, and by referring to the informal measuring tool used
		2	Comparing and ordering capacity through displacement	• explore the concept of displacement • compare and order the capacities of 2 or more objects by marking the change in water level when each is submerged • recognize that changing the shape of an object does not change the amount of water it displaces • record capacity comparisons informally using drawings, numerals and words, and by referring to the uniform informal unit used
Length, Mass, and Capacity **E2.4 compare, estimate, and measure the mass of various objects, using a pan balance and non-standard units**				
Compare, estimate, and measure mass	Measure mass using informal units	1	Measuring mass using informal units	• establish the importance of using uniform informal units to measure mass by comparing to the use of non-uniform informal units • estimate and measure the mass of an object using uniform informal units on a level balance • select an appropriate informal unit to measure and identify the relationship between the size of unit and number of units used • explore the conservation of mass, eg change the shape of a lump of modelling clay
	Compare and order mass, informal units	1	Comparing and ordering masses using uniform informal units	• compare and order masses using uniform informal units by estimating through hefting/lifting and checking with a pan balance • describe the comparison using uniform informal units • find differences in mass by measuring and comparing, eg 'The pencil has a mass equal to 3 blocks and a pair of plastic scissors has a mass of 6 blocks, so the scissors are 3 blocks heavier than the pencil' • compare masses using simple multiples, eg twice and heavy, half as heavy

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Length, Mass, and Capacity E2.4 compare, estimate, and measure the mass of various objects, using a pan balance and non-standard units				
Compare, estimate, and measure mass	Compare, describe, and order mass, pan balance	1	Comparing and describing mass of 2 objects using a pan balance	• establish meaning of a 'level balance' and describe the 2 objects as having 'equal mass/weight' • create a level balance when a larger object is placed on 1 side of a pan balance using smaller objects on the other side • describe the results of imbalance of a pan balance using the terms 'heavier' and 'lighter'
		2	Ordering more than 2 objects by mass using a pan balance	• order more than 2 objects by mass using a pan balance • predict and explain comparisons (transitivity)
Length, Mass, and Capacity E2.5 use various units of different sizes to measure the same attribute of a given item, and demonstrate that even though using different-sized units produces a different count, the size of the attribute remains the same				
Time E2.6 use analog and digital clocks and timers to tell time in hours, minutes, and seconds				
Tell time	Telling time to the hour	1	Telling time to the hour (digital)	• read time on 12-hour digital clocks to the hour using the term 'o'clock' • connect 12-hour digital displays for times to the hour to their corresponding display on an analog clock
		2	Telling time to the hour (analog)	• read time on analog clocks to the hour using the term 'o'clock' • observe and describe the coordinated movements of the hands on an analog clock as time progresses from hour to hour • describe the position or draw of the hands of an analog clock when reading time to the hour • position or draw the hands on an analog clock to show time to the hour • relate the duration of an hour to everyday events;- develop a personal reference for one hour
	Telling time to the hour and half hour	1	Telling time to the hour and half hour (digital)	• read time on 12-hour digital clocks to the half-hour using the terms 'o'clock' and 'half past' • connect 12-hour digital displays for times to the half-hour to their corresponding display on an analog clock • record times on analog clocks to the half-hour in 12-hour digital format • relate hour and half hour times and the duration of a half hour to everyday events;- develop a personal reference for a half hour • position or draw the hands on an analogue clock to show time to the half-hour where the time is given in 12-hour digital format
		2	Telling time to the hour and half hour (analog)	• observe and describe the coordinated movements of the hands on an analogue clock as time progresses in half-hour intervals • describe the position or draw of the hands of an analog clock when reading time to the half hour • read time on analog clocks to the half hour using the terms 'o'clock' and 'half past' • position or draw the hands on an analog clock to show time to the half-hour where the time is given using the terms 'o'clock' or 'half-past' • relate hour and half hour times and the duration of a half hour to everyday events;- develop a personal reference for a half hour

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Time **E2.6 use analog and digital clocks and timers to tell time in hours, minutes, and seconds**				
Tell time	Telling time to the quarter hour	1	Telling time to the quarter hour (digital)	• read time on 12-hour digital clocks to the quarter-hour using the terms 'o'clock', 'half', 'quarter after' and 'quarter to' • position or draw the hands on an analog clock to show time to the quarter-hour where the time is given using the terms 'o'clock' or 'quarter-after' • record times on analog clocks to the quarter-hour in 12-hour digital format • position or draw the hands on an analog clock to show time to the quarter-hour where the time is given in 12-hour digital format • connect 12-hour digital displays for times to the quarter-hour to their corresponding display on an analog clock
		2	Telling time to the quarter hour (analog)	• observe and describe the coordinated movements of the hands on an analog clock as time progresses in quarter hour intervals • describe the position or draw of the hands of an analog clock when reading time to the quarter hour • read time on analog clocks to the quarter-hour using the terms 'o'clock', 'half', 'quarter after' and 'quarter to' and relate to knowledge of fractions
	Telling time to five minutes	1	Telling time to five minutes (digital)	• read time on 12-hour digital clocks to 5 minutes using the terms 'o'clock', 'past' and 'to', including 'half past', 'quarter past' and 'quarter to' • record times on analog clocks to 5 minutes in 12-hour digital format • position or draw the hands on an analogue clock to show time to 5 minutes where the time is given in 12-hour digital format • connect 12-hour digital displays for times to 5 minutes to their corresponding display on an analog clock
		2	Telling time to five minutes (analog)	• observe and describe the movement of the minute hand as time passes, including the time it takes for the minute hand to move from one number to the next and the time it takes for the minute hand to complete one full rotation • observe and describe the movement of the hour hand as time passes, including the time it takes for the hour hand to move from 1 number to the next and the time it takes for the hour hand to complete 1 full rotation • read time on analog clocks to 5 minutes using the terms 'o'clock', 'after' and 'to', including 'half past', 'quarter after' and 'quarter to' and write in words • position or draw the hands on an analog clock to show time to 5 minutes where the time is given using the terms 'o'clock', 'after' and 'to', including 'half past', 'quarter after' and 'quarter to'

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Time **E2.6 use analog and digital clocks and timers to tell time in hours, minutes, and seconds**				
Tell time	Telling time to the minute	1	Telling time to the minute (digital)	• read time on 12-hour digital clocks to the minute using the terms 'o'clock', 'after' and 'to', including 'half-past', 'quarter after' and 'quarter to' and write in words • record times on analog clocks to the minute in 12-hour digital format • position or draw the hands on an analog clock to show time to the minute where the time is given in 12-hour digital format • connect 12-hour digital displays for times, to the minute, to their corresponding display on an analog clock
		2	Telling time to the minute (analog)	• read time on analog clocks to the minute using the terms 'o'clock', 'past' and 'to', including 'half past', 'quarter past' and 'quarter to' • observe and describe the position or draw the hands of an analog clock when reading time to the minute, including the hour hand, minute hand and second hand • position or draw the hands on an analog clock to show time to the minute where the time is given using the terms 'o'clock', 'after' and 'of', including 'half past', 'quarter after' and 'quarter to'
	Telling time to the second	1	Telling time to the second	• read time on analogue and digital clocks to the second
Area **E2.7 compare the areas of two-dimensional shapes by matching, covering, or decomposing and recomposing the shapes, and demonstrate that different shapes can have the same area**				
Compare areas using direct comparison	Comparing areas using direct comparison	1	Comparing areas using direct comparison	• compare areas by positioning one area over another area • compare areas by tracing one area and placing it over the top of another area • describe one area as larger than, the same as (about the same as), or smaller than another area
Area **E2.8 use appropriate non-standard units to measure area, and explain the effect that gaps and overlaps have on accuracy**				
Measure area using non-standard units	Measuring area using non-standard units	1	Measuring area using informal units	• compare use of non-uniform units with uniform units to measure area • tile units to completely cover an area • consider effect of gaps and overlaps when measuring area • recognize iteration and structure in arrangement of uniform informal units to measure the area • identify features that determine whether chosen units will be good units to measure area;- ie, units must be the same size, units need to tile without gaps or overlaps • estimate areas in uniform informal units

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Area **E2.9 use square centimetres (cm²) and square metres (m²) to estimate, measure, and compare the areas of various two-dimensional shapes, including those with curved sides**				
Estimate/ measure/ compare area: cm², m²	Introducing formal units for area: cm²	1	Introducing formal units for area: the square centimetre	• establish the need for a formal unit to measure area and introduce square centimetres • develop a sense of the area of 1 square centimetre and identify surfaces that have area 'about 1 square centimetre', 'less than 1 square centimetre' and 'greater than 1 square centimetre' • identify everyday situations where square centimetres are an appropriate unit for measuring area • introduce the abbreviation cm² for recording area in square centimetre
	Introducing formal units for area: m²	1	Introducing formal units for area: the square metre	• recognize the need for a larger formal unit to measure area and introduce square metres • develop a sense of the area of 1 square metre and identify surfaces that have area 'about 1 square metre', 'less than 1 square metre' and 'greater than 1 square metre' • identify everyday situations where square metres are an appropriate unit for measuring the area, eg floor of a room • recognize that a square metre need not be square in shape, eg cut a piece of cardboard that is 1 metre by 1 metre in half and join the shorter ends to make an area that is 2 metres by half a metre • introduce the abbreviation m² for measuring area in square metres
	Estimate and measure areas of rectangles	1	Estimating and measuring areas of rectangles using efficient strategies and counting in square centimetres or metres	• measure the area of rectangles (including squares) using square centimetres and/or square metres (both tiling and using grid overlay) using whole number side lengths only • estimate areas of rectangles (including squares) in square centimetres and/or square metres and then check by measuring • develop efficient strategies for counting square centimetres/ metres when measuring areas of rectangles • draw possible rectangles on a grid to represent a given whole number rectangular area
	Compare and order rectangular areas	1	Comparing and ordering rectangular areas using counting of standard metric units	• compare two areas by measuring using standard metric units • order three or more areas by measuring using standard metric units • choose the most appropriate unit cm² or m² and justify selection
	Approximate/ compare areas, non-rectilinear shapes	1	Approximating and comparing areas of non-rectilinear shapes using a square centimetre grid	• use a square-centimetre grid to approximate and compare the areas of non-rectilinear shapes • compare how different placements of the grid make approximation easier or more difficult • find and explain the area of irregular shapes by counting squares or part squares

Ontario Curriculum Grades 3

Understanding Practice and Fluency (UPF)

F. Financial Literacy

F1. Money and Finances - demonstrate an understanding of the value and use of Canadian currency

Quest	Learning Journey	Steps	Content	Detail
Money Concepts F1.1 estimate and calculate the change required for various simple cash transactions involving whole-dollar amounts and amounts of less than one dollar				
Estimate and calculate change	Estimating and calculating change	1	Estimating and calculating the change required for various simple cash transactions involving whole-dollar amounts and amounts of less than 1 dollar | Canada	• calculate the change required for various simple cash transactions involving whole-dollar amounts and amounts of less than 1 dollar

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers **B1.1 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 and writing 4-digit numbers	1	Reading and writing 4-digit numbers using words and numerals	• write a given 4-digit number in words, eg 4567 as four thousand, four hundred and sixty-seven • write the numerals for a 4-digit number given in words
		2	Representing 4-digit numbers using words, numerals and objects	• model a given 4-digit number using concrete materials, pictures or drawings • write the numerals in words, eg 'seven thousand, three hundred and fifty three' for a 4-digit number represented using place value equipment or using pictures, drawings
	Using place value to partition 4-digit numbers	1	Using place value to partition 4-digit numbers	• use place value equipment to partition a given 4-digit number into thousands, hundreds, tens and ones • describe a 4-digit number using words, eg 9523 as '9 thousands, 5 hundreds, 2 tens and 3 ones' • write a 4-digit number in expanded notation, eg 7523 as 7000 + 500 + 20 + 3 • write the numeral for a number represented by expanded form • recognize zero as a placeholder
	Non-standard partitioning: 4-digit numbers	1	Partitioning 4-digit numbers using non-standard partitioning	• use place value equipment to partition a given 4-digit number using non-standard partitioning, eg 2375 as 2 thousands, 1 hundred and 275 ones or 2000 + 100 + 275 • model and identify a number from non-standard partitioning, eg recognize 3 hundreds, 4 tens and 27 ones or 300 + 40 + 27 as 367
	Identifying place value: 4-digit numbers	1	Identifying the place value of digits in 4-digit numbers	• write the numeral for a 4-digit number modelled using place value equipment • identify the digit in the thousands, hundreds, tens or ones column for a given 4-digit number • identify, record and model a number using place value clues, eg 'an 8 in the thousands, 5 in the hundreds and a 2 in the ones' as 8502 • recognize the role of zero as a placeholder • create the smallest and largest numbers possible using 4 digits

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

Mathletics

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers **B1.2 compare and order whole numbers up to and including 10 000, in various contexts**				
Compare and order 4-digit numbers	Comparing and ordering 4-digit numbers	1	Comparing numbers to 10 000	• model and compare two 4-digit numbers using place value equipment • compare two numbers of up to 4 digits and describe using the terms and symbols: greater than (>) or less than (<); explain the comparison using place value reasoning
		2	Ordering numbers to 10 000	• order up to 4 consecutive 2-digit, 3-digit or 4-digit numbers within 10 000 in ascending order or descending order; explain the reason for the order given • order up to 4 non-consecutive 2-digit, 3-digit or 4-digit numbers within 1000 in ascending or descending order; explain the reason for the order given using place value reasoning
Whole Numbers **B1.3 round whole numbers to the nearest ten, hundred, or thousand, in various contexts**				
Round 4-digit numbers	Rounding 4-digit numbers	1	Rounding numbers up to 10 000 to the nearest 1000	• model a 4-digit number and recognize which thousand it is nearer to; explain reasoning • round a 4-digit number to the nearest 1000; recognize the digit in the hundreds column as the key digit
		2	Rounding numbers up to 10 000 to the nearest 10, 100 or 1000	• round a 4-digit number to the nearest 10, 100 or 1000; explain the rounding
Fractions and Decimals **B1.4 represent fractions from halves to tenths using drawings, tools, and standard fractional notation, and explain the meanings of the denominator and the numerator**				
Representing fractions, halves to tenths	Introducing the terms numerator and denominator	1	Introducing the terms numerator and denominator	• read and write symbols to represent fractions • use the terms denominator and numerator to describe a fraction
	Representing halves and fourths	1	Finding halves and quarters of objects, shapes or sets (symbols used)	• find halves and quarters of objects and shapes • find halves and quarters of sets • find the whole from a part • find halves and quarters of uneven partitioned shapes • use language 'one half', 'two halves', 'one quarter', 'two quarters' and so on • use symbols to represent fractions: 1/2, 2/2, 1/4, 2/4, 3/4, 4/4

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions and Decimals B1.4 represent fractions from halves to tenths using drawings, tools, and standard fractional notation, and explain the meanings of the denominator and the numerator				
Representing fractions, halves to tenths	Representing thirds	1	Introducing thirds	• find thirds of objects, shapes and lengths • find thirds of sets • estimate the size of a fractional part before using eg paper folding to check or estimate the size of the whole from the part • find the whole from a part • use language 'one third', 'two thirds', 'three thirds' • use symbols to represent: 1/3, 2/3, 3/3
	Representing sixths	1	Introducing sixths	• find sixths of objects and shapes • find sixths of sets • estimate the size of a fractional part before using, eg paper folding to check or estimate the size of the whole from the part • find the whole from a part • use language 'one sixth', 'two sixths', 'three sixths' • use symbols to represent: 1/6, 2/6, 3/6 • understand the relationship between thirds and sixths
	Representing fifths	1	Introducing fifths	• estimate the size of a fractional part before using, eg paper folding to check or estimate the size of the whole from the part • find fifths of objects, shapes and lengths • find fifths of sets • find the whole from a part • use language 'one fifth', 'two fifths', 'three fifths' and so on • use symbols to represent fractions 1/5, 2/5 ...
	Representing tenths	1	Introducing tenths	• recognize that tenths come from 10 equal parts • find tenths of objects, sets and shapes • find the whole from the part • use language 'one tenth', 'two tenths' etc • use symbols to represent fractions 1/10, 2/10 etc • recognize that tenths come from dividing 1-digit numbers or quantities by 10
	Representing eighths	1	Introducing eighths of objects or shapes	• find eighths of objects and shapes • recognize equivalence with halves and quarters • use the language of 'one eighth', 'two eighths' and so forth along with standard fractional notation

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions and Decimals **B1.5 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 and order fractions with models	Compare and order unit fractions with models	1	Comparing and ordering unit fractions with different denominators using models and diagrams	• compare and order common unit fractions using models and diagrams for support • compare and order common fractions with different denominators (halves, thirds, quarters, fifths, sixths, sevenths, eighths)
	Compare and order common fractions with models	1	Comparing and ordering common fractions with different denominators using models and diagrams	• compare and order common fractions using models and diagrams for support • compare and order common fractions with different denominators (halves, thirds, quarters, fifths, sixths, sevenths, eighths)
	Compare fractions with the same numerator	1	Comparing fractions with the same numerator up to 1 using >, =, < (denominators 2, 3, 4, 6, 8)	• compare fractions with the same numerator up to 1 using >, =, < (denominators 2, 3, 4, 6, 8)
	Compare fractions with the same denominator	1	Comparing fractions with the same denominator up to 1 using >, =, < (denominators 2, 3, 4, 6, 8)	• compare fractions with the same denominator up to 1 using >, =, < (denominators 2, 3, 4, 6, 8)
Fractions and Decimals **B1.6 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 and fourths	1	Counting up to 10 in halves and quarters (symbols used)	• count up to 10 from any starting point in halves and quarters • use the number line to count with halves and quarters
	Counting in thirds on a number line up to 3	1	Counting in thirds on a number line up to 3	• count in proper and improper fractions on a number line • identify whole number equivalence 3/3 = 1, 6/3 = 2
	Counting in tenths	1	Counting in tenths	• count up in tenths using proper fractions and mixed numerals (starting from any multiple of tenths), including on a number line • count down in tenths using proper fractions and mixed numerals (starting from any multiple of tenths) , including on a number line • represent counting in tenths using number lines and models
	Counting in fractions	1	Counting in simple fractions with denominators of 2, 3, 4, 5, 6, 8, 10 and 100 both forwards and backwards on a number line (between 0 and 10)	• count forwards in unit fractions starting from 0 and extending beyond 1 • count forwards in unit fractions starting from any multiple of the unit fraction and extending beyond 1 • count backwards in unit fractions starting from any multiple of the unit fraction (no further than 0)

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions and Decimals B1.7 read, represent, compare, and order decimal tenths, in various contexts				
Decimal tenths	Introducing decimal notation	1	Introducing decimal notation	• identify decimal fractions in everyday use • understand that the decimal point is a mark that identifies the ones place, and indicates the change from whole numbers to parts of a whole • read decimal fractions correctly, ie 'six point nine' • understand that any numbers after the decimal point represent part of a whole
	Introducing decimal tenths	1	Introducing decimal tenths	• recognize that the place value system can be extended to tenths • represent tenths using concrete materials and written representations • recognize that tenths arise from dividing an object into 10 equal parts • recognize that tenths arise from dividing a one-digit number or quantity by 10 • identify decimals on a number line • represent decimals using models and place value equipment such as base ten and arrow cards, place value grid, hundred square
	Comparing and ordering decimal tenths	1	Comparing and ordering decimal tenths	• compare and order tenths using >, < and =
Fractions and Decimals B1.8 round decimal numbers to the nearest whole number, in various contexts				
Round decimal tenths	Round decimal tenths, nearest whole	1	Rounding decimal tenths	• round tenths to the nearest whole number
Fractions and Decimals B1.9 describe relationships and show equivalences among fractions and decimal tenths, in various contexts				
Equivalence, fractions & decimal tenths	Connecting decimal tenths to common fractions	1	Connecting decimal numbers to common fractions involving tenths	• understand the relationship between decimal numbers and common fractions involving tenths • recognize and apply decimal notation to express whole numbers and tenths as decimals, eg 0.1 is the same as 1/10 • investigate equivalences using various methods, eg use a number line or a calculator to show that 1/2 is the same as 0.5 and 5/10

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

Mathletics

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Properties and Relationships **B2.1 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 and properties	Multiplication properties	1	Using the commutative property of multiplication up to 10 x 10	• use the commutative property of multiplication, eg 7 x 9 = 9 x 7
		2	Using the associative property of multiplication up to 10 x 10	• use the associative property of multiplication up to 10 x 10
		3	Using the distributive property up to 10 x 10	• use the distributive property up to 10 x 10
		4	Multiplying 3 or more single-digit numbers using the commutative and associative properties	• apply the commutative property of multiplication • explore and apply the associative property of multiplication, eg 2 x 3 x 5 = 2 x 5 x 3 = 10 x 3 = 30
		5	Representing and multiplying a 2-digit number by a 1-digit number using place value understanding and the distributive property	• represent and use place value to solve a multiplication fact, eg multiplying the tens and then the units, eg 7 × 19: 7 tens + 7 nines is 70 + 63, which is 133 • explain and justify the use of the strategy
	Checking calculations, addition and subtraction	1	Checking accuracy of addition and subtraction calculations	• check solutions to problems by using the inverse operation • round numbers appropriately when obtaining estimates to numerical calculations • use estimation to check the reasonableness of answers to addition and subtraction calculations
	Divide 2-digit by 1-digit, inverse relationship	1	Dividing a 2-digit number by a 1-digit number using the inverse relationship of multiplication and division (no remainders)	• divide a 2-digit number by a 1-digit number using the inverse relationship of multiplication and division, eg 63 ÷ 9 = 7 because 7 x 9 = 63
Math Facts **B2.2 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	1	Recalling multiplication facts for 2	• recall the 2 multiplication facts
	Recalling multiplication facts for 3	1	Recalling multiplication facts for 3	• recall the multiplication facts for 3
	Recalling multiplication facts for 4	1	Recalling multiplication facts for 4	• recall the multiplication facts for 4
	Recalling multiplication facts for 5	1	Recalling multiplication facts for 5	• recall the 5 multiplication facts

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Math Facts B2.2 recall and demonstrate multiplication facts for 1 × 1 to 10 × 10, and related division facts				
Multiplication/ division facts, 1-10	Recalling multiplication facts for 6	1	Recalling multiplication facts for 6	• recall the multiplication facts for 6
	Recalling multiplication facts for 7	1	Recalling multiplication facts for 7	• recall the multiplication facts for 7
	Recalling multiplication facts for 8	1	Recalling multiplication facts for 8	• recall the multiplication facts for 8
	Recalling multiplication facts for 9	1	Recalling multiplication facts for 9	• recall the multiplication facts for 9
	Recalling the multiplication facts for 10	1	Recalling the multiplication facts for 10	• recall the 10 multiplication facts
	Recalling multiplication facts to 10 x 10	1	Recalling multiplication facts up to 10 x 10 with automaticity	• recall facts in order • recall facts in random order • create a table or simple spreadsheet to record multiplication facts
	Recalling the division facts for 2	1	Recalling the division facts for 2	• recall the division facts for 2
	Recalling the division facts for 3	1	Recalling the division facts for 3 up to 30	• recall the division facts for 3
	Recalling division facts for 4	1	Recalling division facts for 4	• recall the division facts for 4
	Recalling the division facts for 5	1	Recalling the division facts for 5	• recall the division facts for 5
	Recalling division facts for 6	1	Recalling division facts for 6	• recall the division facts for 6
	Recalling division facts for 7	1	Recalling division facts for 7	• recall the division facts for 7
	Recalling division facts for 8	1	Recalling division facts for 8	• recall the division facts for 8
	Recalling division facts for 9	1	Recalling division facts for 9	• recall the division facts for 9
	Recalling the division facts for 10	1	Recalling the division facts for 10	• recall the division facts for 10

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Mental Math **B2.3 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 strategies, 4 operations	Adding decimal tenths using mental strategies	1	Adding decimals to 1 decimal place using mental strategies	• select and apply efficient mental strategies to solve addition problems, including compensation, bridging to 1, using place value • record strategies using numbers, models and diagrams • relate decimals to fractions to aid mental strategies • solve word problems using mental strategies, including problems involving measurement
Addition and Subtraction **B2.4 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 10 000 and of decimal tenths, using appropriate tools and strategies, including algorithms**				
Add/subtract whole numbers and tenths	Add numbers up to 5 digits, mental strategies	1	Choosing efficient mental addition strategies with numbers up to five digits	• apply place value and partitioning to rearrange and regroup numbers to assist with calculations, eg use rounding and compensating, fraction strip, jump strategies, split strategies, place value strategies or bridging strategies • use a range of recording methods to solve addition problems, eg number sentences, empty number line, regrouping
		2	Solving one-step word problems using efficient mental addition strategies with numbers up to five digits	• solve addition word problems using mental strategies
	Add numbers up to 4 digits, algorithm	1	Using a formal written algorithm for addition calculations up to four-digit numbers (no carrying)	• apply algorithms to solve problems without carrying, with the same number of places and with a different number of places • use estimation or reverse operation to check the reasonableness of solutions
		2	Using a formal written algorithm for addition calculations up to four-digit numbers (with carrying)	• apply algorithms to solve problems with carrying in 1 or more places, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	Subtract numbers up to 5 digits, mental strategies	1	Choosing efficient mental subtraction strategies with numbers up to five digits	• apply place value and partitioning to rearrange and regroup numbers to assist with calculations, eg use rounding and compensating, jump strategies, split strategies, place value strategies or bridging strategies • use a range of recording methods to solve subtraction problems, eg number sentences, empty number line, regrouping
		2	Solving word problems using efficient mental subtraction strategies with numbers up to five digits	• solve subtraction word problems using mental strategies

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.4 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 10 000 and of decimal tenths, using appropriate tools and strategies, including algorithms**				
Add/subtract whole numbers and tenths	Subtract numbers up to 4 digits, algorithm	1	Using a formal written algorithm to record subtraction calculations involving up to four-digit numbers (without decomposing)	• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions
		2	Using a formal written algorithm to record subtraction calculations involving up to four-digit numbers (with decomposing)	• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	Add decimal tenths using a variety of strategies	1	Adding decimals to 1 decimal place using place value partitioning and models for support	• apply place value partitioning to add tenths and whole numbers or just tenths eg 3.4 + 5.2 as 3 + 5 and 4 tenths + 2 tenths
		2	Adding decimals to 1 decimal place using rounding and compensating and models for support	• apply rounding and compensating to add tenths and whole numbers or just tenths eg 3.9 + 5.2 as 4 + 5.2 = 9.2, 9.2 - 0.1 = 9.1
		3	Adding decimals to 1 decimal place using bridging to 10 and models for support	• apply bridging to 10 to add tenths and whole numbers or just tenths eg 3.8 + 0.5 as 3.8 + 0.2 + 0.3

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

Mathletics

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division **B2.5 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**				
Multiplying 2- and 3-digit numbers	Multiply 2-digit numbers by 100	1	Representing and using known facts to multiply 2-digit numbers by 100	• represent with models/diagrams and use known facts and place value understanding to multiply 2-digit numbers by 100, eg 13 x 100 = 10 x 100 + 3 x 100 • know that multiplying by 100 shifts the digits 2 places to the left
	Multiply 2-digit by 1-digit, area model	1	Multiplying a 2-digit number by a 1-digit number using an area model	• use area model to solve multiplication problems • explain and justify the use of the strategy
	Multiply 2-digit by 1-digit, doubling	1	Representing and multiplying a 2-digit number by a 1-digit number using doubling and related facts	• represent and use doubling to multiply a 2-digit and 1-digit number, eg 41 × 6 is 41 × 3, which is 123, and then double to obtain 246 • explain and justify the use of the strategy
	Multiply 2-digit by 1-digit, algorithm	1	Multiplying 2-digit numbers by 1-digit numbers using the contracted algorithm (no carrying)	• multiply the ones, then the tens, without regrouping
		2	Multiplying 2-digit numbers by 1-digit numbers using the contracted algorithm (with regrouping)	• multiply 2-digit numbers by 1-digit numbers using the contracted algorithm (with regrouping)
	Multiply 2-digit by 1-digit, expanded algorithm	1	Multiplying 2-digit numbers by 1-digit numbers using the expanded algorithm	• multiply the ones, then the tens, with and without regrouping • model the method with place value models or diagrams; relate to the area model • check answers to mental calculations using inverse solutions or digital technologies
	Multiply 2-digit by 1-digit, rounding/ compensating	1	Multiplying 1-digit and 2-digit numbers using rounding and compensating	• use known facts to solve multiplication problems by adding on or taking off, eg 5 x 100 is 500, so 5 x 99 is 5 less, which is 495 • explain and justify the use of the strategy
	Multiply 3-digit by 1-digit, place value	1	Multiplying 3-digit numbers by 1-digit numbers using split method	• multiply the hundreds, then the tens and then the ones • check answers to mental calculations using digital technologies • use inverse operations to justify solutions
	Multiply 3-digit by 1-digit, area model	1	Multiplying 3-digit numbers by 1-digit numbers using an area model	• use an area model for 3-digit by 1-digit multiplication • check answers to mental calculations using digital technologies • use inverse operations to justify solutions

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division **B2.5 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**				
Multiplying 2- and 3-digit numbers	Multiply 3-digit by 1-digit, expanded algorithm	1	Multiplying 3-digit numbers by 1-digit numbers using the expanded algorithm	• multiply the ones, then the tens, then the hundreds, with and without regrouping • model the method with place value models or diagrams; relate to the area model • check answers to mental calculations using inverse solutions or digital technologies
	Multiply 3-digit by 1-digit, algorithm	1	Multiplying 3-digit numbers by 1-digit numbers using the contracted algorithm	• multiply the ones, then the tens, then the hundreds, with and without regrouping • use inverse operations or digital technologies to check solutions
Multiplication and Division **B2.6 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**				
Dividing 2-/3-digits by 1-digit	Divide 2-digit by 1-digit, halving	1	Dividing a 2-digit number by a 1-digit number using halving and repeated halving (no remainders)	• use halve to divide by 2 • use halve, halve to divide by 4 • use halve, halve, halve to divide by 8
	Divide 2-digit by 1-digit, related facts	1	Dividing a 2-digit number by a 1-digit number using related facts (no remainders)	• use related facts to divide a 2-digit number by a 1-digit number, eg to divide by 5, first divide by 10 and then multiply by 2
	Divide 2-digit by 1-digit, extended algorithm	1	Dividing a 2-digit number by a 1-digit divisor using the extended algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, without remainders and without zeros in the answer
		2	Dividing a 2-digit number by a 1-digit divisor using the extended algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, with remainders but without zeros in the answer
		3	Dividing a 2-digit number by a 1-digit divisor using the extended algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, with and without remainders and zeros in the answer
	Divide 2-digit by 1-digit, algorithm	1	Dividing a 2-digit number by a 1-digit divisor using the contracted algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, without remainders and without zeros in the answer
		2	Dividing a 2-digit number by a 1-digit divisor using the contracted algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, with remainders but without zeros in the answer
		3	Dividing a 2-digit number by a 1-digit divisor using the contracted algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide a 2-digit number by a 1-digit number, with and without remainders and zeros in the answer

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

Mathletics

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division **B2.6 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**				
Dividing 2-/3-digits by 1-digit	Divide 3-digit by 1-digit, place value	1	Dividing a 3-digit number by a 1-digit number using partitioning	• partition a 3-digit number to divide
	Divide 3-digit by 1-digit, extended algorithm	1	Dividing a 3-digit number by a 1-digit divisor using the extended algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, without remainders and without zeros in the answer
		2	Dividing a 3-digit number by a 1-digit divisor using the extended algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, with remainders but without zeros in the answer
		3	Dividing a 3-digit number by a 1-digit divisor using the extended algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, with and without remainders and zeros in the answer
	Divide 3-digit by 1-digit, algorithm	1	Dividing a 3-digit number by a 1-digit divisor using the contracted algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, without remainders and without zeros in the answer
		2	Dividing a 3-digit number by a 1-digit divisor using the contracted algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, with remainders but without zeros in the answer
		3	Dividing a 3-digit number by a 1-digit divisor using the contracted algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide a 3-digit number by a 1-digit number, with and without remainders and zeros in the answer
Multiplication and Division **B2.7 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	1	Multiplying unit fractions by whole numbers using models and diagrams	• apply and extend previous understandings of multiplication to multiply a unit fraction by a whole number • use repeated addition to represent and multiply unit fractions by whole numbers, eg $1/5 \times 3 = 1/5 + 1/5 + 1/5 = 3/5$ • develop a rule for multiplying unit fractions by whole numbers, eg multiply the numerator by the whole number • solve word problems involving multiplication of unit fractions by whole numbers, including area and length problems

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.8 show simple multiplicative relationships involving whole-number rates, using various tools and drawings				
Solving problems involving rates	Solving simple problems involving speed	1	Introducing speed using metric units	• recognize symbols used to record speed in kilometres per hour • solve simple problems involving speed

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.1 identify and describe repeating and growing patterns, including patterns found in real-life contexts**				
ID/describe repeating & growing patterns	Identifying and creating additive number patterns	1	Identifying and creating additive number patterns (3s, 4s, 6s, 7s, 8s, 9s, from any starting point within 100)	• identify additive number patterns, eg patterns that increase in 3s, 4s, 6s, 7s, 8s and 9s from any starting point • describe the rule for a forwards (additive) number pattern, eg 'It goes up by 3s' • continue and create an additive number pattern
	Exploring number patterns, addition table	1	Exploring number patterns represented in addition tables and charts	• identify and explore patterns in an addition table and explain using properties of operations
	Exploring number patterns, multiplication table	1	Exploring number patterns represented in multiplication tables and charts	• identify and explore patterns in a multiplication table, eg all the 10 times tables are in a straight line or 4 times a number is always even
Patterns **C1.2 create and translate repeating and growing patterns using various representations, including tables of values and graphs**				
Creating repeating and growing patterns	Creating shape patterns from a given rule	1	Generating shape patterns from a given rule	• extend and create a shape pattern given the core of the sequence • identify apparent features of that pattern that were not explicit in the rule
	Creating addition patterns from a given rule	1	Generating addition patterns from a given rule	• extend and create a number pattern that follows an addition rule, eg generate the pattern when given the starting number of 1 and the rule 'add 3' • extend and create a shape pattern that follows an addition rule, eg a growing pattern of triangles made using matchsticks • identify apparent features of that pattern that were not explicit in the rule
	Creating multiplication patterns from a given rule	1	Generating multiplication patterns from a given rule	• extend and create a number pattern that follows a rule, eg 'start at 1 and multiply each term by 2 to get the next term' generates the sequence 1, 2, 4, 8, 16, 32, 64, ... • identify apparent features of that pattern that were not explicit in the rule

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.3 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 and growing	Number sequences: multiples of 3, 4, 6, 7, 8, 9	1	Investigating number sequences involving multiples of 3, 4, 6, 7, 8 and 9	• generate number patterns using multiples of 3, 4, 6, 7, 8 and 9 • investigate visual number patterns on a number chart • find missing terms in a number sequence
	Number patterns, multiplication	1	Exploring number patterns resulting from performing multiplication	• find a higher term in a number pattern resulting from performing multiplication, given the first few terms, eg determine the next term in the pattern 4, 8, 16, 32, 64, ... • describe how the next term in a number pattern is calculated, eg 'Each term in the pattern is double the previous term' • find missing terms in a number sequence

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Equalities and Inequalities **C2.2 solve equations that involve whole numbers up to 50 in various contexts, and verify solutions**				
Solving equations, numbers up to 50	Solving addition/ subtraction equations up to 18	1	Finding the missing number to make an addition or subtraction number sentence true (up to 18)	• complete number sentences involving 1 operation of addition or subtraction by finding the missing number using a variety of tools, equipment and strategies, eg using guess and check, eg 5 + (box symbol) = 13 or 15 - (box symbol) = 9
	Addition and subtraction word problems	1	Writing number sentences to solve word problems (1-digit and 2-digit addition and subtraction)	• represent a word problem as an addition or subtraction number sentence • solve and check the appropriateness of the answer against the word problem • pose an addition or subtraction word problem using a given number sentence

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Collection and Organization D1.1 describe the difference between qualitative and quantitative data, and describe situations where each would be used				
Qualitative and quantitative data	Identifying qualitative and quantitative data	1	Identifying qualitative and quantitative data	• identify qualitative and quantitative data
Data Collection and Organization D1.2 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				
Collecting and comparing data	Collecting and recording category data in tables	1	Collecting and recording category data in tables	• create a list of categories for efficient data collection and present in a table format, eg 'Which sport is the most popular with members of our class?' • sort data from a simple survey and create a list or table to organize the data, eg sort data on the number of children in a class • determine which data should be collected and presented in the table
Data Visualization D1.3 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	Interpret and represent data, multiple-bar graphs	1	Introducing and interpreting multiple-bar graphs	• interpret multiple-bar graphs for 2 categorical variables, eg favourite television show of students in Grade 1 compared to that of students in Grade 6 • ask and answer comparative and relational questions related to data in multiple-bar graph
		2	Representing bivariate data in a multiple-bar graph	• construct a multiple-bar graph for two categorical variables eg favourite television show of students in Grade 1 compared to that of students in Grade 6 • ask and answer comparative and relational questions related to data in a multiple-bar graph
Data Analysis D1.5 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, and mode	The mean: understanding and calculating	1	Understanding the mean	• explore a set of values in data displays and in lists with the aim of summarizing all of the values with a single number • calculate the mean for a small set of data that would produce a whole number • use the mean to describe the shape of the data set across its range of values, using charts, tables, and graphs (eg, 'The data values fall mainly into two groups on both sides of the mean.'; 'The set of data is not spread out evenly around the mean.') • decide if the mean is the best representative number for the centre of the data set; justify and discuss
		2	Calculating the mean	• calculate the mean for a small set of data

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Analysis **D1.5 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, and mode	The median: understanding and calculating	1	Understanding the median	• explore a set of values in data displays and in lists with the aim of summarizing all of the values with a single number • organize values in order and find the middle number (median) • decide if the median is the best representative number for the centre of data set; justify and discuss
		2	Calculating the median	• organize values in order and find the middle number (median)
	The mode: understanding and calculating	1	Understanding the mode	• explore a set of values in data displays and in lists with the aim of summarizing all of the values with a single number • organize values in order and find the value that is occurs the most • decide if the mode is the best representative number for centre of the data set; justify and discuss
		2	Calculating the mode	• organize values in order and find the value that occurs the most

D2. Probability - describe the likelihood that events will happen, and use that information to make predictions

Quest	Learning Journey	Steps	Content	Detail
Probability **D2.1 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**				
Using probability language	Describe the chances of everyday events occurring	1	Describing the chances of everyday events occurring	• use the terms 'equally likely', 'likely' and 'unlikely' to describe the chance of everyday events occurring • compare the chance of familiar events occurring and describe the events as being 'more likely' or 'less likely' to occur than each other • order events from least likely to most likely to occur

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Location and Movement E1.2 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				
Introducing the Cartesian plane	The Cartesian coordinate system, 1st quadrant	1	Using the coordinate plane in the first quadrant only	• recognize that the axes are labelled x and y • locate and plot points on a Cartesian coordinate plane
Location and Movement E1.3 describe and perform translations and reflections on a grid, and predict the results of these transformations				
Translations and reflections	Translations	1	Creating patterns that result from translations	• extend and create repeating patterns that result from translations through investigation using a variety of tools, eg pattern blocks, dynamic geometry software, dot paper • describe the pattern • predict the next term/s in the pattern

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
The Metric System E2.1 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 and capacity	Introducing formal units for mass: the gram	1	Introducing formal units for mass: the gram	• establish the need for a smaller unit of mass and introduce the gram, including that 1000 grams = 1 kilogram • develop a sense of the mass of standard everyday objects in grams, eg an egg is about 50 grams • identify everyday situations where grams are an appropriate unit for measuring the mass • introduce the abbreviation 'g' for recording mass in grams and record masses • calculate the number of grams in a whole number of kilograms • interpret simple fractions (¼, ½, ¾) of a kilogram and relate these to the number of grams
	Introducing formal units for mass: the kilogram	1	Introducing formal units for mass: the kilogram	• establish the need for formal units to measure mass and introduce the kilogram • develop a sense of the mass of 1 kilogram and identify objects that have mass 'about 1 kilogram', 'less than 1 kilogram', 'greater than 1 kilogram', eg a litre of milk is about 1 kilogram, a standard pack of flour is 1 kilogram • identify everyday situations where kilograms are an appropriate unit for measuring the mass • introduce the abbreviation 'kg' for recording mass in kilograms

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
The Metric System **E2.1 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 and capacity	Introducing formal units for capacity: millilitres	1	Introducing formal units for volume and capacity: millilitres	• recognize the need for a formal unit smaller than the litre to measure volume and capacity • recognize that there are 1000 millilitres in 1 litre, ie 1000 millilitres = 1 litre • relate the millilitre to familiar everyday containers and familiar informal units, eg 250 mL fruit juice containers, 1 teaspoon is approximately 5 mL
	Introducing formal units for capacity: litres	1	Introducing formal units for volume and capacity: litres	• recognize and explain the need for formal units to measure volume and capacity • develop a personal reference for one litre and fractions of 1 litre (quarters and halves); relate the litre to familiar everyday containers, eg milk cartons • recognize that one-litre containers can be a variety of shapes • record volumes and capacities using the abbreviation for litres (L)
	Estimating capacities using millilitres and litres	1	Estimating given capacities in millilitres and litres	• make appropriate estimations of capacities using millilitres and litres
The Metric System **E2.2 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 and tools	Select/use metric units/ devices, mass	1	Selecting and using the appropriate metric unit and device to measure mass	• select and use the appropriate metric unit and device to measure mass
	Select/use metric units/ devices, capacity	1	Selecting and justifying appropriate metric units to measure volume and capacity (mL and L)	• select and use appropriate units to measure the capacities of a variety of containers • select and use appropriate units to estimate the volumes of a variety of objects
	Select/use metric units, length	1	Selecting appropriate units of measurement: metres, centimetres, millimetres	• explore the appropriateness of units when measuring length • select and justify the most appropriate metric unit to measure given lengths and distances

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Time **E2.3 solve problems involving elapsed time by applying the relationships between different units of time**				
Solving problems involving elapsed time	Calculating elapsed time, one unit of time	1	Calculating elapsed time within one unit of measurement	• estimate and determine elapsed time in hours only • estimate and determine elapsed time in minutes only, without crossing an hour • estimate and determine elapsed time in minutes only, including crossing an hour
	Calculating elapsed time, different units of time	1	Calculating elapsed time across units of measurement (to five minutes)	• estimate and determine elapsed time given the durations of events, expressed in 5 minute intervals, hours, days, weeks, months or years
	Calculating elapsed time	1	Calculating elapsed time	• solve problems involving elapsed time given the starting or finishing time • estimate, measure and represent time intervals to the nearest second • use a stopwatch to measure, compare and order the duration of events • use start and finish times to calculate the elapsed time of events • select an appropriate unit to measure a particular period of time
Angles **E2.4 identify angles and classify them as right, straight, acute, or obtuse**				
Classifying angles	Classifying angles as acute, right or obtuse	1	Classifying angles as acute, right or obtuse	• identify and name angles as acute, right or obtuse • categorize angles as acute, right or obtuse • draw and create angles of a given size: acute, right, obtuse (no protractors)
	Introducing angles	1	Introducing the concept of angles up to 180°	• understand and describe angles as an amount of turning, openings • identify angles in everyday situations, eg door openings, designs, between the arms of a clock • recognize that angles are formed whenever 2 lines meet or when 2 rays meet at a common endpoint
	Identifying right angles	1	Introducing right angles	• identify right angles on two-dimensional shapes and three-dimensional objects • identify right angles in pictures, designs and the environment • identify right angles in line diagrams • use and interpret the symbol □ in diagrams to represent a right angle • define perpendicular lines and identify them in pictures, designs and the environment • recognize that a pair of perpendicular lines form 4 right angles

Ontario Curriculum Grades 4

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Area **E2.5 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	1	Developing an additive formula for area of a rectangle	• connect arrays with side lengths through repeated addition leading to multiplication
	Finding the area of a rectangle, area model	1	Using area models and the distributive property to find the area of a rectangle	• use area models and the distributive property to find the area of a rectangle
Area **E2.6 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	1	Developing a multiplicative formula for area of a rectangle using metric units	• connect the area of a rectangle to the multiplication of its side lengths and develop a formula (in words) for the area of a rectangle, eg Area of rectangle = length x width • calculate the area of a rectangle by multiplying the length and width of the rectangle • calculate a side length of the rectangle given its area and one other side length • explain methods for finding the area of a square as a type of rectangle; connect multiplying equal sides to the concept of square numbers
		2	Applying the formula for the area of a rectangle	• develop the formula for the area of a rectangle, A = l × w (also A = lw) • apply the formula for area of a rectangle to find the area of rectangles given 2 side lengths measured in the same or different units • apply the formula for area of a rectangle to find the area of composite rectilinear figures, such as an L-shape, U-shape • apply the formula to real life contexts

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Whole Numbers B1.1 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 and writing 5-digit numbers	1	Reading and writing numbers up to 5 digits	• apply an understanding of place value to read numbers up to 5 digits • apply an understanding of place value to write numbers up to 5 digits
	Identifying place value: 5-digit numbers	1	Identifying the place value of digits in numbers up to 5 digits	• state the place value of digits in numbers of up to 5 digits • pose and answer questions that extend place value understanding of numbers, eg 'What happens if I rearrange the digits in the number 12 345?', 'How can I rearrange the digits to make the largest number?' • represent and describe whole numbers to 10 000 pictorially and symbolically
	Using place value to partition 5-digit numbers	1	Using place value to partition 5-digit numbers	• use place value to partition numbers of up to 5 digits, eg 67 012 is 60 000 + 7000 + 10 + 2
		2	Using non-standard partitioning with 5-digit numbers	• partition numbers of up to 5 digits in non-standard forms, eg 67 000 as 50 000 + 17 000
	Rounding 5-digit numbers	1	Rounding 5-digit numbers	• round to the nearest 10, 100, 1000 or 10 000
Whole Numbers B1.2 compare and order whole numbers up to and including 100 000, in various contexts				
Compare and order 5-digit numbers	Comparing and ordering 5-digit numbers	1	Comparing 5-digit numbers using words and symbols	• compare two 5-digit numbers using words and symbols <, =, >
		2	Ordering numbers up to 5 digits	• arrange numbers of up to 5 digits in ascending and descending order
Fractions, Decimals, and Percents B1.3 represent equivalent fractions from halves to twelfths, including improper fractions and mixed numbers, using appropriate tools, in various contexts				
Equivalent fractions	Finding equivalent fractions up to 1	1	Using multiplicative strategies to recognize and find equivalent fractions with related denominators up to 1 whole (denominators 2, 3, 4, 5, 6, 8, 10)	• develop mental strategies for generating equivalent fractions, such as multiplying or dividing the numerator and the denominator by the same number • explain or demonstrate why 2 fractions are or are not equivalent • use multiplication and division to make equivalent fractions with a given related denominator eg 1/2 = ?/16

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions, Decimals, and Percents B1.3 represent equivalent fractions from halves to twelfths, including improper fractions and mixed numbers, using appropriate tools, in various contexts				
Equivalent fractions	Finding equivalent fractions greater than 1	1	Using multiplicative strategies to recognize and find equivalent fractions greater than 1 with related denominators (denominators 2, 3, 4, 5, 6, 8, 10)	• develop mental strategies for generating equivalent fractions, such as multiplying or dividing the numerator and the denominator by the same number • explain or demonstrate why 2 fractions are or are not equivalent • use multiplication and division to make equivalent fractions with a given related denominator eg 1 and 1/2 = ?/16 • work with proper fractions, mixed numerals and improper fractions
	Converting improper fractions to mixed numbers	1	Developing strategies to convert from improper fractions to mixed numbers using models and diagrams	• express improper fractions as mixed numbers through the use of diagrams and number lines • develop strategies for converting between mixed numbers and improper fractions • connect equivalent fractions >1 to division with remainders, using the number line and other models, and hence move from these to improper and mixed fractions
	Converting mixed numbers to improper fractions	1	Developing strategies to convert from mixed numbers to improper fractions using models and diagrams	• express mixed numbers as improper fractions through the use of diagrams and number lines • develop strategies, including multiplication strategies for converting between mixed numbers and improper fractions
Fractions, Decimals, and Percents B1.4 compare and order fractions from halves to twelfths, including improper fractions and mixed numbers, in various contexts				
Compare and order fractions	Comparing unit fractions	1	Comparing unit fractions with different denominators (denominators of 2, 3, 4, 5, 6, 8, 10, 12)	• model, compare and order common unit fractions • locate and represent unit fractions on a number line • compare the relative value of unit fractions by placing them on a number line between 0 and 1 • investigate and explain the relationship between the value of a unit fraction and its denominator • compare using <,>, =
	Comparing proper fractions	1	Using common denominators to compare and order proper fractions with related denominators	• find a common denominator to compare fractions • compare and order using <, >, =

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions, Decimals, and Percents B1.5 read, represent, compare, and order decimal numbers up to hundredths, in various contexts				
Decimal numbers to hundredths	Introducing decimal numbers in the hundredths	1	Introducing decimal hundredths	• recognize that the place value system can be extended to tenths and hundredths • recognize that hundredths arise when dividing an object by 100 and dividing tenths by 10 • state the place value of digits in decimal numbers of up to 2 decimal places • read decimal numbers correctly, ie 'six point one nine' rather than 'six point nineteen'
	Representing decimal numbers up to hundredths	1	Modelling and representing decimal numbers up to 2 decimal places	• model decimal numbers using concrete materials • represent decimal numbers, eg as fractions (tenths and hundredths), on number lines, using hundreds grids, in place value models and charts
	Compare and order decimal numbers up to hundredths	1	Comparing and ordering decimal hundredths	• compare numbers with the same number of decimal places up to 2 decimal places
		2	Comparing decimal numbers up to 2 decimal places	• compare numbers with a different number of decimal places up to 2 decimal places using >, < and =
Fractions, Decimals, and Percents B1.6 round decimal numbers to the nearest tenth, in various contexts				
Round decimal hundredths	Round decimal hundredths, nearest whole and tenth	1	Rounding decimal hundredths	• round hundredths to the nearest whole number • round hundredths to the nearest tenth
Fractions, Decimals, and Percents B1.7 describe relationships and show equivalences among fractions, decimal numbers up to hundredths, and whole number percents, using appropriate tools and drawings, in various contexts				
Fractions, decimal numbers and percents	Connecting decimal numbers and fractions	1	Connecting decimal numbers to common fractions involving tenths and hundredths	• understand the relationship between decimal numbers and common fractions involving tenths and hundredths • recognize and apply decimal notation to express whole numbers, tenths and hundredths as decimals, eg 0.1 is the same as 1/10 • investigate equivalences using various methods, eg use a number line or a calculator to show that 1/2 is the same as 0.5 and 5/10
		2	Connecting decimal numbers to common fractions involving halves, fifths, tenths and hundredths	• understand the relationship between decimal numbers and common fractions involving halves, fifths, tenths and hundredths

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions, Decimals, and Percents **B1.7 describe relationships and show equivalences among fractions, decimal numbers up to hundredths, and whole number percents, using appropriate tools and drawings, in various contexts**				
Fractions, decimal numbers and percents	Representing fractions as percents	1	Representing common fractions as percentages	• represent common fractions as percentages and vice versa • model percentages with concrete materials/ drawings, eg using 10x10grid
	Representing percents and decimals	1	Representing percentages and decimals	• write decimals (< 1) to 2 decimal places as percentages • model percentages and decimals using diagrams, eg number line or 100 grid • write decimals as percentages and vice versa
	Fraction, decimal number and percent equivalence	1	Investigating the relationships between fractions, decimals and percentages	• investigate using concrete materials, drawings and calculators, the relationships between decimals, percentages and fractions with denominators of 2, 4, 5, 10, 20, 25, 50 and 100 • record relationships between decimals, percentages and fractions (with denominators 2, 4, 5, 10, 20, 25, 50, 100) • demonstrate understanding using symbolic representation
		2	Representing common equivalent fractions, decimals, and percentages	• recall the relationships between decimals, percentages, and fractions with denominators of 2, 4, 5, 10, 20, 25, 50, and 100 • recognize fractions, decimals, and percentages as different representations of the same value • interpret and explain the use of fractions, decimals, and percentages in everyday contexts • relate equivalence to proportion

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Properties and Relationships B2.1 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				
Using inverse operations and properties	Checking addition and subtraction calculations	1	Checking accuracy of addition and subtraction calculations	• check solutions to problems by using the inverse operation • round numbers appropriately when obtaining estimates to numerical calculations • use estimation to check the reasonableness of answers to addition and subtraction calculations
	Using inverse operations to solve problems	1	Describing and using inverse operations to solve number sentences with whole numbers and any of the 4 operations	• identify and use inverse operations to assist with the solution of number sentences, eg 125 ÷ 5 = ? becomes ? × 5 = 125 • describe how inverse operations can be used to solve a number sentence • check solutions to number sentences by substituting the solution into the original question
	Using the commutative property of multiplication	1	Using the commutative property of multiplication up to 12 x 12	• use the commutative property of multiplication, eg 7 x 12 = 12 x 7
	Dividing using the distributive property	1	Dividing up to 4-digit numbers by 1-digit divisors using the distributive property with models for support	• solve division problems by splitting factors, e.g., 125 ÷ 5 as (100 ÷ 5) + (25 ÷ 5) using models • illustrate and explain the calculation using equations, rectangular arrays and/or area models
Math Facts B2.2 recall and demonstrate multiplication facts from 0 × 0 to 12 × 12, and related division facts				
Multiplication/ division facts, 0-12	Multiplication facts for 3	1	Recalling multiplication facts for 3 (up to 12x)	• recall the multiplication facts for 3
	Multiplication facts for 4	1	Recalling multiplication facts for 4 (up to 12x)	• recall the multiplication facts for 4
	Multiplication facts for 6	1	Recalling and using multiplication facts for 6 (up to 72)	• recall the multiplication facts for 6 • solve multiplication problems with 6 including word problems
	Multiplication facts for 7	1	Recalling and using multiplication facts for 7 (up to 84)	• recall the multiplication facts for 7 • solve multiplication problems with 7 including word problems
	Multiplication facts for 8	1	Recalling and using multiplication facts for 8 (up to 96)	• recall the multiplication facts for 8 • solve multiplication problems with 8 including word problems
	Multiplication facts for 9	1	Recalling and using multiplication facts for 9 (up to 108)	• recall the multiplication facts for 9 • solve multiplication problems with 9 including word problems

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Math Facts B2.2 recall and demonstrate multiplication facts from 0 × 0 to 12 × 12, and related division facts				
Multiplication/ division facts, 0-12	Multiplication facts for 11	1	Multiplying by 11 (up to 12x)	• recall the multiplication facts for 11
	Multiplication facts for 12	1	Multiplying by 12 (up to 12x)	• recall the multiplication facts for 12
	Division facts for 6	1	Recalling and using division facts for 6 up to 72	• recall the division facts for 6 • solve division problems with 6 including word problems
	Division facts for 7	1	Recalling and using division facts for 7 up to 84	• recall the division facts for 7 • solve division problems with 7 including word problems
	Division facts for 8	1	Recalling and using division facts for 8 up to 96	• recall the division facts for 8 • solve division problems with 8 including word problem
	Division facts for 9	1	Recalling and using division facts for 9 up to 108	• recall the division facts for 9 • solve division problems with 9 including word problems
	Division facts for 11	1	Dividing by 11	• recall the division facts for 11 • solve division problems with 11 including word problems
	Division facts for 12	1	Dividing by 12	• recall the division facts for 12 • solve division problems with 12, including word problems
	Recalling multiplication facts up to 10 x 10	1	Recalling multiplication facts up to 10 x 10 with automaticity	• recall facts in order • recall facts in random order • create a table or simple spreadsheet to record multiplication facts
Mental Math B2.3 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	Add decimals to hundredths, mental strategies	1	Adding decimals to 2 decimal places using mental strategies	• select and apply efficient mental strategies to solve addition problems, including compensation, bridging to 1, using place value • estimate sums • record strategies using numbers, models and diagrams • relate decimals to fractions to aid mental strategies • solve word problems using mental strategies, including problems involving measurement and money
	Subtract decimals to hundredths, mental strategies	1	Subtracting decimals to 2 decimal places using mental strategies	• select and apply efficient mental strategies to solve subtraction problems, including compensation, bridging to 1, using place value • estimate differences • record strategies using numbers, models and diagrams • relate decimals to fractions to aid mental strategies • solve word problems using mental strategies, including problems involving measurement and money

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

Mathletics

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.4 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 and decimals	Add 5-digit numbers, algorithm	1	Using a formal written algorithm for addition calculations up to five-digit numbers (no carrying)	• apply algorithms to solve problems without carrying, with the same number of places and with a different number of places;- include opportunities for students to write their own algorithms with digits in correct place value positions;- include word problems • use estimation or reverse operation to check the reasonableness of solutions
		2	Using a formal written algorithm for addition calculations up to five-digit numbers (with carrying)	• apply algorithms to solve problems with carrying in 1 or more places, with the same number of places and with a different number of places;- include opportunities for students to write their own algorithms with digits in correct place value positions;- include word problems • use estimation or reverse operation to check the reasonableness of solutions
	Subtract 5-digit numbers, algorithm	1	Using a formal written algorithm to record subtraction calculations involving up to five-digit numbers (without decomposing)	• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend);- include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first;- include word problems • use estimation or reverse operation to check the reasonableness of solutions
		2	Using a formal written algorithm to record subtraction calculations involving up to five-digit numbers (with decomposing)	• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend);- include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first;- include word problems • use estimation or reverse operation to check the reasonableness of solutions
	Add 5-digit numbers, mental strategies	1	Choosing efficient mental addition strategies with numbers up to five digits	• apply place value and partitioning to rearrange and regroup numbers to assist with calculations, eg use rounding and compensating, bar model, jump strategies, split strategies, place value strategies or bridging strategies • use a range of recording methods to solve addition problems, eg number sentences, empty number line, regrouping

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.4 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 and decimals	Add 5-digit numbers, mental strategies	2	Solving one-step word problems using efficient mental addition strategies with numbers up to five digits	• solve addition word problems using mental strategies
	Subtract 5-digit numbers, mental strategies	1	Choosing efficient mental subtraction strategies with numbers up to five digits	• apply place value and partitioning to rearrange and regroup numbers to assist with calculations, eg use rounding and compensating, jump strategies, split strategies, place value strategies or bridging strategies • use a range of recording methods to solve subtraction problems, eg number sentences, empty number line, regrouping
		2	Solving word problems using efficient mental subtraction strategies with numbers up to five digits	• solve subtraction word problems using mental strategies
	Add decimals to hundredths	1	Adding decimals to hundredths	• add a whole number and a decimal (to hundredths) • add 2 decimal numbers in tenths • add 2 decimals numbers in hundredths • add decimal numbers to 2 places (mixed place value)
	Subtract decimals to hundredths	1	Subtracting decimals to hundredths	• subtract a decimal up to the hundredths place from a whole number • subtract 2 decimal numbers in tenths • subtract 2 decimal numbers in hundredths • subtract 2 decimal numbers to 2 places (mixed place value)
Addition and Subtraction **B2.5 add and subtract fractions with like denominators, in various contexts**				
Add/subtract fractions, like denominators	Add fractions with like denominators	1	Adding proper fractions with the same denominator (denominators 2, 3, 4, 5, 6, 7, 8)	• add proper fractions with the same denominator • model and represent strategies, including using diagrams and written representations
	Add mixed numbers with like denominators	1	Adding mixed numbers with the same denominator	• add mixed numbers with the same denominator • model and represent strategies, including using diagrams and written representation

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Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction B2.5 add and subtract fractions with like denominators, in various contexts				
Add/subtract fractions, like denominators	Subtract fractions like denominators	1	Subtracting proper fractions with the same denominator (denominators 2, 3, 4, 5, 6, 7, 8)	• subtract proper fractions with the same denominator • model and represent strategies, including using diagrams and written representations
	Subtract mixed numbers with like denominators	1	Subtracting mixed numbers with the same denominator	• subtract mixed numbers with the same denominator • model and represent strategies, including using diagrams and written representation
	Add and subtract fractions with like denominators	1	Adding and subtracting proper fractions with the same denominator (denominators 2, 3, 4, 5, 6, 7, 8)	• add and subtract proper fractions with the same denominator • model and represent strategies, including using diagrams and written representations
Multiplication and Division B2.6 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				
Multiplying 2-digit by 2-digit	Multiplying 2-digit by 2-digit, area model	1	Multiplying 2-digit numbers by 2-digit numbers using an area model	• use an area model for 2-digit by 2-digit multiplication • check answers to mental calculations using digital technologies • use inverse operations to justify solutions
	Multiplying 2-digit by 2-digit, expanded form	1	Factorizing to multiply a 2-digit number by a 2-digit number	• factorize to multiply a 2-digit number by a 2-digit number, e.g., 12 × 25 = 3 × 4 × 25 = 3 × 100 = 300
	Multiplying 2-digit by 2-digit, algorithm	1	Multiplying 2-digit numbers by 2-digit numbers using the extended form of the formal algorithm	• multiply 2-digit by 2-digit numbers using extended form, with and without regrouping • check answers to mental calculations using digital technologies • use inverse operations to justify solutions
Multiplication and Division B2.8 multiply and divide one-digit whole numbers by unit fractions, using appropriate tools and drawings				
Multiply/divide fractions, whole numbers	Multiplying unit fractions by whole numbers	1	Multiplying unit fractions by whole numbers using models and diagrams	• apply and extend previous understandings of multiplication to multiply a unit fraction by a whole number • use repeated addition to represent and multiply unit fractions by whole numbers, eg 1/5 × 3 = 1/5 + 1/5 + 1/5 = 3/5 • develop a rule for multiplying unit fractions by whole numbers, eg multiply the numerator by the whole number • solve word problems involving multiplication of unit fractions by whole numbers, including area and length problems

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division **B2.9 represent and create equivalent ratios and rates, using a variety of tools and models, in various contexts**				
Equivalent ratios and rates	Equivalent ratios	1	Identifying equivalent ratios	• identify equivalent ratios • understand how a change made to 1 part of a ratio affects the other parts of the same ratio
		2	Creating tables of equivalent ratios	• make tables of equivalent ratios relating quantities
	Equivalent rates	1	Understanding that a rate, in simplest form, is the comparison of an amount per unit value of another	• understand that a rate, in simplest form, is the comparison of an amount per unit value of another

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.1 identify and describe repeating, growing, and shrinking patterns, including patterns found in real-life contexts**				
Describing patterns, including shrinking	Identify/create additive and subtractive patterns	1	Identifying and creating additive and subtractive number patterns (3s, 4s, 6s, 7s, 8s, 9s, from any starting point within 100)	• identify additive or subtractive number patterns on a number line, hundreds chart or calendar, eg patterns that increase in 3s, 4s, 6s, 7s, 8s and 9s from any starting point • describe the rule for a forwards (additive) or backwards (subtractive) number pattern, eg 'It goes up by 3s' • continue and create an additive or subtractive number pattern represented in numbers, on a number line or expressed in words, eg 'make a pattern that starts at 0 and grows by adding 7 each time'
	Recognize patterns: add, subtract or multiply	1	Recognizing patterns with 1 operation involving addition, subtraction, or multiplication (doubling) up to 1000	• identify patterns with involving addition, subtraction, or multiplication on a number line, hundreds chart, or calendar • describe the rule for a number pattern, e.g., 'It goes up by 3s', or 'it doubles each time'
Patterns **C1.2 create and translate growing and shrinking patterns using various representations, including tables of values and graphs**				
Creating growing and shrinking patterns	Identifying and creating additive patterns	1	Identifying and creating additive number patterns (3s, 4s, 6s, 7s, 8s, 9s, from any starting point within 100)	• identify additive number patterns, eg patterns that increase in 3s, 4s, 6s, 7s, 8s and 9s from any starting point • describe the rule for a forwards (additive) number pattern, eg 'It goes up by 3s' • continue and create an additive number pattern
	Identifying and creating subtractive patterns	1	Identifying and creating subtractive number patterns (3s, 4s, 6s, 7s, 8s, 9s, from any starting point within 100)	• identify subtractive number patterns, eg patterns that decrease by 3s, 4s, 6s, 7s, 8s and 9s from any starting point • describe the rule for a backwards (subtractive) number pattern, eg 'It goes down by 3s' • continue and create a subtractive number pattern represented in numbers, on a number line or expressed in words, eg 'make a pattern that starts at 20 and shrinks by subtracting 2 each time'

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Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns**				
Determining rules and extending patterns	Generating subtraction patterns from a given rule	1	Generating subtraction patterns from a given rule	• extend and create a number pattern that follows a subtraction rule, eg generate the pattern when given the starting number of 30 and the rule 'subtract 3' • extend and create a shape pattern that follows a subtraction rule, eg a decreasing pattern of triangles made using matchsticks • identify apparent features of that pattern that were not explicit in the rule
	Generating addition patterns from a given rule	1	Generating addition patterns from a given rule	• extend and create a number pattern that follows an addition rule, eg generate the pattern when given the starting number of 1 and the rule 'add 3' • extend and create a shape pattern that follows an addition rule, eg a growing pattern of triangles made using matchsticks • identify apparent features of that pattern that were not explicit in the rule

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Variables and Expressions **C2.1 translate among words, algebraic expressions, and visual representations that describe equivalent relationships**				
Algebraic expressions, words and visuals	Matching words and algebraic expressions	1	Using algebraic symbols to represent mathematical operations written in words and vice versa	• use algebraic symbols to represent mathematical operations written in words and vice versa, eg the product of x and y is xy, x + y is the sum of x and y • create scenarios in words that match given algebraic operations
	Translating words into algebraic expressions	1	Writing expressions with numbers and variables	• write expressions with numbers and variables
		2	Connecting algebraic language to everyday language	• translate from everyday language to algebraic language and vice versa • use algebraic symbols to represent simple situations described in words • interpret statements involving algebraic symbols in other contexts

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Variables and Expressions C2.2 evaluate algebraic expressions that involve whole numbers				
Evaluate algebraic expressions	Creating and evaluating algebraic expressions	1	Creating algebraic expressions	• create algebraic expressions and evaluate them by substituting a given value for each variable
		2	Substituting known values in for variables	• substitute known values in for variables to find the value of an expression, eg if x = 2 and y = 3, find the value of 2x + 3y
Equalities and Inequalities C2.3 solve equations that involve whole numbers up to 100 in various contexts, and verify solutions				
Solving equations, numbers up to 100	Solving addition and subtraction equations	1	Using inverse operations to complete addition and/or subtraction number sentences (2-digit numbers)	• complete number sentences involving addition and subtraction by calculating missing numbers, eg find the missing numbers: ? + 55 = 83, ? − 15 = 19 • use inverse operations to complete number sentences • justify solutions when completing number sentences

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Analysis **D1.5 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 and calculating the mean	1	Understanding the mean	• explore a set of values in data displays and in lists with the aim of summarizing all of the values with a single number • calculate the mean for a small set of data that would produce a whole number • use the mean to describe the shape of the data set across its range of values, using charts, tables, and graphs (eg, 'The data values fall mainly into two groups on both sides of the mean.';- 'The set of data is not spread out evenly around the mean.') • decide if the mean is the best representative number for the center of the data set;- justify and discuss
		2	Calculating the mean	• calculate the mean for a small set of data
	Understanding and calculating the median	1	Understanding the median	• explore a set of values in data displays and in lists with the aim of summarising all of the values with a single number • organize values in order and find the middle number (median) • decide if the median is the best representative number for the centre of data set;- justify and discuss
		2	Calculating the median	• organize values in order and find the middle number (median)
	Understanding and calculating the mode	1	Understanding the mode	• explore a set of values in data displays and in lists with the aim of summarising all of the values with a single number • organize values in order and find the value that is occurs the most • decide if the mode is the best representative number for centre of the data set;- justify and discuss
		2	Calculating the mode	• organize values in order and find the value that is occurs the most

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

D. Data

D2. Probability - describe the likelihood that events will happen, and use that information to make predictions

Quest	Learning Journey	Steps	Content	Detail
Probability **D2.1 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**				
Expressing probability with fractions	Expressing probability with 0, 1/2 or 1	1	Describing the chances of simple events occurring using familiar language and numeric benchmarks	• create, order, describe and explain the likelihood of simple events using the language of probability and numeric benchmarks of 0, 1/2 and 1
Probability **D2.2 determine and compare the theoretical and experimental probabilities of an event happening**				
Theoretical and experimental probability	Comparing observed and expected frequencies	1	Comparing observed frequencies with expected frequencies in chance experiments	• use the term 'frequency' to describe the number of times a particular outcome occurs in a chance experiment • distinguish between the 'frequency' of an outcome and the 'probability' of an outcome in a chance experiment • record and compare the expected frequencies of outcomes of chance experiments with observed frequencies, including where the outcomes are not equally likely • explain why observed frequencies of outcomes in chance experiments may differ from expected frequencies • recognize that some random generators have outcomes that are not equally likely and discuss the effect on expected outcomes

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Geometric Reasoning E1.1 identify geometric properties of triangles, and construct different types of triangles when given side or angle measurements				
Classifying triangles	Classifying triangles	1	Classifying triangles by their sides and angles	• identify and name right-angled, equilateral, isosceles and scalene triangles • compare and describe features of the sides and angles of equilateral, isosceles and scalene triangles • identify triangles that are right-angled as well as scalene or isosceles • explore, by measurement, side and angle properties of equilateral, isosceles and scalene triangles
Geometric Reasoning E1.3 draw top, front, and side views of objects, and match drawings with objects				
2D representations of 3D objects	Nets of prisms and pyramids	1	Connecting prisms and pyramids with their nets	• examine a diagram to determine whether it is or is not the net of a prism or pyramid • explain why a given net will not form a prism or pyramid • visualize and sketch nets for a given prism or pyramid • recognize whether a diagram is a net of a particular prism or pyramid • visualize and name prisms and pyramids, given diagrams of their nets • select the correct diagram of a net for a given prism or pyramid from a group of similar diagrams where the others are not valid nets of the object
Location and Movement E1.4 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	1	Using the coordinate plane in the first quadrant only	• recognize that the axes are labelled x and y • locate and plot points on a Cartesian plane
Location and Movement E1.5 describe and perform translations, reflections, and rotations up to 180˚ on a grid, and predict the results of these transformations				
Translations, reflections, and rotations	Translations, reflections, and rotations	1	Defining transformations: One-step translations, reflections and rotations	• define translations, reflections and rotations of shapes and describe the similarities and differences between the original shape and the transformed shape • identify the one-step transformation used to move a shape from 1 position to another

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
The Metric System E2.1 use appropriate metric units to estimate and measure length, area, mass, and capacity				
Measuring in metric units	Measuring length	1	Measuring length using standard metric units	• select and use the appropriate unit and measuring device to measure lengths and distances • describe how a length or distance is estimated and measured • explain why different results may be obtained from the same measurements • estimate lengths and distances using an appropriate unit and check by measuring;- determine and justify when an estimation is sufficient • relate metric units and SI units
	Measuring mass	1	Measuring in grams	• estimate mass using personal references for grams and 'guess and check' • measure mass in grams by using and interpreting varied scales and images of scales • record mass in grams using the appropriate abbreviation (g)
		2	Measuring in grams and kilograms	• estimate mass using personal references for grams and kilograms • choose appropriate standard units to estimate and measure (g/kg) • measure mass in grams and kilograms by using and interpreting varied scales • record mass in grams, kilograms and mixed units using the appropriate abbreviations (g), (kg), eg 5 kg and 500 g
		3	Selecting and using the appropriate metric unit and device to measure mass	• select and use the appropriate metric unit and device to measure mass
	Measuring capacity	1	Estimating capacities using millilitres and litres as references	• make appropriate estimations of capacities using millilitres and litres as referents
		2	Measuring with millilitres to the nearest 100 mL	• use the millilitre as a unit to measure volume and capacity, using a device calibrated in millilitres (read to the nearest 100ml with every 100mL or every other 100mL marked) • record volumes and capacities using the abbreviation for millilitres (mL) • estimate the capacity of a container in millilitres and check by measuring (measure to the nearest 100mL with every 100mL or every other 100mL marked) • compare and order the capacities of 2 or more containers measured in millilitres
		3	Selecting and justifying appropriate metric units to measure volume and capacity (mL and L)	• select and use appropriate units to measure the capacities of a variety of containers • select and use appropriate units to estimate the volumes of a variety of objects

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Angles **E2.4 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**				
Angles up to 180°	Measuring and estimating angles up to 180°	1	Measuring and estimating angles of up to 180° in degrees	• measure angles of up to 180° using a protractor • estimate angles of up to 180° and check by measuring
Area **E2.5 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 and triangles	Calculating the area of a triangle	1	Calculating area of a right-angled triangle without a formula	• establish that the area of a right-angled triangle is half the area of a rectangle with the same base and perpendicular height • calculate the area of right-angled triangles using the relationship that the area is half the area of a rectangle with the same base and perpendicular height • calculate the area of right-angled triangles where all three side lengths are given, using the relationship that the area is half the area of a rectangle with the same base and perpendicular height
		2	Calculating area of any triangle	• establish that the area of any triangle is Area of triangle = ½ × base × perpendicular height, including triangles in which the perpendicular height meets the base within the length of the base and also triangles in which the perpendicular height (altitude) meets the base outside the length of the base • calculate the area of triangles where more dimensions than are necessary are given, using the relationship that the area is half the area of a rectangle with the same base and perpendicular height
		3	Solving real-life problems involving calculating the area of triangles	• solve real-life problems involving calculating the area of triangles
	Applying the formula for the area of a triangle	1	Applying the formula for the area of a triangle	• use and apply the formula for the area of a triangle • establish the formula for the area of a triangle, A = ½ × b × h (also A = ½ bh) • apply the formula to find the areas of right-angled triangles • apply the formula to find the areas of triangles in which the perpendicular height meets the base within the length of the base • apply the formula to find the areas of triangles in which the perpendicular height meets the base outside the length of the base

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Area **E2.5 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 and triangles	Calculating the area of parallelograms	1	Finding the area of a parallelogram using a formula	• apply the formula to find the area of parallelograms in different orientations • apply the formula to find the area of parallelograms in different orientations which include more dimensions than are necessary to calculate the area
		2	Solving real-life problems involving calculating the area of parallelograms	• solve real-life problems involving calculating the area of parallelograms
Area **E2.6 show that two-dimensional shapes with the same area can have different perimeters, and solve related problems**				
Area and perimeter relationships	Comparing areas and perimeters of rectangles	1	Comparing areas and perimeters of rectangles	• construct different rectangles with the same area and compare their perimeters • construct different rectangles with the same perimeters and compare their areas • investigate the relationship between the side lengths of a rectangle and its perimeter and area • investigate the relationship between the side lengths of a square and its perimeter and area
	Solving perimeter and area problems	1	Solving problems relating to perimeter and area of rectangles and squares	• pose and solve problems that require the distinction between perimeter and area • draw a number of rectangles of differing areas with the same perimeter;- compare with squares • determine that only one square is possible if given the area of a square;- compare with rectangles • investigate what happens to the area of the shape if the length of one pair of opposite sides of the shape are doubled or halved

Ontario Curriculum Grades 5

Understanding Practice and Fluency (UPF)

F. Financial Literacy

F1. Money and Finances - demonstrate the knowledge and skills needed to make informed financial decisions

Quest	Learning Journey	Steps	Content	Detail
Money Concepts **F1.2 estimate and calculate the cost of transactions involving multiple items priced in dollars and cents, including sales tax, using various strategies**				
Money problems, dollars and cents	Money problems, adding and subtracting	1	Using money: Addition and subtraction problems	• use addition and subtraction to solve a variety of problems involving purchases of two or more items, including calculating change, and record the value using a decimal point and the symbol $ • use estimation to check the reasonableness of solutions to problems involving purchases and calculation of change
Consumer and Civic Awareness **F1.5 calculate unit rates for various goods and services, and identify which rates offer the best value**				
Unit rates and best value	Calculating best buys using the unit rate	1	Calculating 'best buys' by comparing price per unit, or quantity per monetary unit, with the use of digital technologies	• calculate 'best buys' by comparing price per unit, or quantity per monetary unit, with the use of digital technologies, eg 500 g for $4.50 compared with 300 g for $2.75 • use price comparison websites to make informed decisions related to purchases under given conditions

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Rational Numbers B1.1 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 up to one million	Reading and writing 6-digit numbers	1	Reading and writing 6-digit numbers	• apply an understanding of place value to read numbers of up to 6 digits • apply an understanding of place value to write numbers of up to 6 digits
	Identifying place value: 6-digit numbers	1	Naming the place value for a digit in a number	• name the place value for an underlined digit in a number • identify the value of an underlined digit in a number
		2	Identifying the place value of 6-digit numbers	• state the place value of digits in numbers of up to 6 digits • pose and answer questions that extend place value understanding of numbers, eg 'What happens if I rearrange the digits in the number 128 345?', 'How can I rearrange the digits to make the largest number?' • represent and describe whole numbers to 1 000 000
	Using place value to partition 6-digit numbers	1	Using place value to partition 6-digit numbers	• use place value to partition numbers of up to 6 digits, eg 672 012 is 600 000 + 70 000 + 2000 + 10 + 2
		2	Using non-standard partitioning with 6-digit numbers	• partition numbers of up to 6 digits in non-standard forms, eg 670 000 as 500 000 + 170 000
	Rounding 6-digit numbers	1	Rounding 6-digit numbers	• round 6-digit numbers to any place value
Rational Numbers B1.2 read and represent integers, using a variety of tools and strategies, including horizontal and vertical number lines				
Read and represent integers	Investigating integers	1	Investigating integers	• recognize the location of negative whole numbers in relation to zero and place them on a number line • use the term 'integers' to describe positive and negative whole numbers and zero • investigate negative whole numbers and the number patterns created when counting backward on a calculator • recognize that negative whole numbers can result from subtraction
	Understanding integers in real-life contexts	1	Exploring everyday language around integers (positive and negative numbers)	• explore and relate the everyday language of a variety of real-world situations to the use of negative and positive numbers and explain the meaning of 0 in each situation • represent statements about real-world contexts using integers

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Rational Numbers **B1.3 compare and order integers, decimal numbers, and fractions, separately and in combination, in various contexts**				
Compare/ order: integer/ decimal/ fraction	Placing integers on a number line	1	Placing integers on a number line	• place integers on a number line
	Compare/ order fractions and mixed numbers	1	Comparing and ordering proper fractions	• compare and order proper fractions where the denominators are not always multiples of the same number • record comparisons using =, ≠, <, > ≤, ≥ symbols
		2	Comparing and ordering improper fractions	• compare and order improper fractions where the denominators are not always multiples of the same number • record comparisons using =, ≠, <, > ≤, ≥ symbols
		3	Comparing and ordering proper fractions, improper fractions, and mixed numbers	• compare and order proper fractions, improper fractions, and mixed numbers where the denominators are not always multiples of the same number • record comparisons using =, ≠, <, > ≤, ≥ symbols
	Order fractions and decimal numbers	1	Ordering fractions and decimals, including terminating and repeating	• order fractions and decimals, including terminating and repeating
	Order decimal numbers: terminating and repeating	1	Ordering decimals, terminating and repeating	• order decimals, terminating and repeating
Fractions, Decimals, and Percents **B1.4 read, represent, compare, and order decimal numbers up to thousandths, in various contexts**				
Decimal numbers up to thousandths	Introducing decimal numbers in the thousandths	1	Introducing decimal thousandths	• recognize that the place value system can be extended beyond hundredths • express thousandths as decimals • interpret decimal notation for thousandths, eg 0.123 = 123/1000 • state the place value of digits in decimal numbers of up to 3 decimal places • model thousandths using concrete materials • represent decimal fractions, eg as fractions (tenths, hundredths and thousandths), using concrete materials and in diagrams

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions, Decimals, and Percents B1.4 read, represent, compare, and order decimal numbers up to thousandths, in various contexts				
Decimal numbers up to thousandths	Compare/ order decimal numbers up to thousandths	1	Comparing and ordering decimal fractions of up to 3 decimal places	• place decimal numbers of up to 3 decimal places on a number line between 0 and 1 • compare and order decimals with 3 decimal places using >, < and = • compare and order decimals with a different number of decimal places, up to 3 decimal places
	Partitioning decimal numbers up to thousandths	1	Partitioning decimal thousandths	• use place value to partition decimals of up to 3 decimal places • partition decimals of up to 3 decimal places in non-standard forms • partition fractions up to thousandths into decimals and fractions
Fractions, Decimals, and Percents B1.5 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 decimal numbers to hundredths	1	Round decimals to hundredths	• round decimal thousandths to the nearest hundredth
	Rounding decimal numbers to tenths or hundredths	1	Round decimals to tenths or hundredths	• round decimal thousandths to the nearest tenths or hundredths
Fractions, Decimals, and Percents B1.6 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 and decimals up to thousandths	1	Relating fractions and decimals up to 3 decimal places	• find an equivalent fraction with denominators of 10, 100 or 1000 to convert from fractions to decimals

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

Mathletics

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Properties and Relationships **B2.1 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**				
Using properties and inverse operations	Using inverse operations, whole numbers	1	Describing and using inverse operations to solve number sentences with whole numbers and any of the 4 operations	• identify and use inverse operations to assist with the solution of number sentences, eg 125 ÷ 5 = ? becomes ? × 5 = 125 • describe how inverse operations can be used to solve a number sentence • check solutions to number sentences by substituting the solution into the original question
Math Facts **B2.2 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	1	Introducing divisibility tests for dividing by 2	• determine that a number is divisible by 2 if it is an even number, ie the last digit is 0, 2, 4, 6 or 8 • apply divisibility test to find multiples of 2
	Divisibility rules for dividing by 3	1	Introducing divisibility tests for dividing by 3	• determine that a number is divisible by 3 if the sum of its digits can be divided by 3 • apply divisibility test to find multiples of 3
	Divisibility rules for dividing by 4	1	Introducing divisibility tests for dividing by 4	• determine that a number is divisible by 4 if the last 2 digits can be divided by 4 • apply divisibility test to find multiples of 4
	Divisibility rules for dividing by 5	1	Introducing divisibility tests for dividing by 5	• determine that a number is divisible by 5 if the last digit is 0 or 5 • apply divisibility test to find multiples of 5
	Divisibility rules for dividing by 6	1	Introducing divisibility tests for dividing by 6	• determine that a number is divisible by 6 if it is divisible by both 2 and 3, ie it is even and the sum of the digits can be divided by 3 • apply divisibility test to find multiples of 6
	Divisibility rules for dividing by 8	1	Introducing divisibility tests for dividing by 8	• determine that a number is divisible by 8 if the last 3 digits can be divided by 8 • apply divisibility test to find multiples of 8
	Divisibility rules for dividing by 9	1	Introducing divisibility tests for dividing by 9	• determine that a number is divisible by 9 if the sum of the digits can be divided by 9 • apply divisibility test to find multiples of 9
	Divisibility rules for dividing by 10	1	Introducing divisibility tests for dividing by 10	• determine that a number is divisible by 10 if the last digit is 0 • apply divisibility test to find multiples of 10
	Divisibility rules: dividing by 2, 3, 4, 5, 6, 10	1	Determining and applying tests of divisibility for 2, 3, 4, 5, 6 and 10	• determine and apply tests of divisibility for 2, 3, 4, 5, 6 and 10 • verify the various tests of divisibility using a calculator

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Mental Math **B2.3 use mental math strategies to calculate percents of whole numbers, including 1%, 5%, 10%, 15%, 25%, and 50%, and explain the strategies used**				
Calculating percents of whole numbers	Calculating simple percentages	1	Calculating simple percentages	• estimate 0%, 1%, 10%, 25%, 50% and 100% of an amount including examples in context (exclude discounts), explain estimation • model 10%, 25% and 50% of an amount • calculate 10%, 25% and 50% of an amount including examples in context (exclude discounts)
		2	Calculating simple percentages of quantities	• equate 10% to 1/10, 25% to 1/4 and 50% to 1/2 • use mental strategies to estimate discounts of 10%, 25% and 50%, • calculate the sale price of an item after a discount of 10%, 25% and 50%, recording the strategy and result
	Using 50%, 10%, 1% to mentally calculate amounts	1	Using 50%, 10% and 1% to mentally calculate amounts	• use 50%, 10%, and 1% as strategies to mentally calculate amounts
Addition and Subtraction **B2.4 represent and solve problems involving the addition and subtraction of whole numbers and decimal numbers, using estimation and algorithms**				
Add/subtract whole and decimal numbers	Adding decimals to thousandths	1	Adding decimals to 3 decimal places using mental strategies	• select and apply efficient mental strategies to solve addition problems, including compensation, bridging to 1, using place value • record strategies using numbers, models and diagrams • relate decimals to fractions to aid mental strategies • solve word problems using mental strategies, including problems involving measurement and money
		2	Adding decimals using written method	• use a standard algorithm to add decimals with the same number of decimal places • use a standard algorithm to add decimals with a different number of decimal places • use estimation and rounding to check the reasonableness of answers when adding decimals

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction B2.4 represent and solve problems involving the addition and subtraction of whole numbers and decimal numbers, using estimation and algorithms				
Add/subtract whole and decimal numbers	Subtracting decimals to thousandths	1	Subtracting decimals using mental strategies	• select and apply efficient mental strategies to solve subtraction problems, including compensation, bridging to 1, using place value • record strategies using numbers, models and diagrams • relate decimals to fractions to aid mental strategies • solve word problems using mental strategies, including problems involving measurement and money
		2	Subtracting decimals using written method	• use a standard algorithm to subtract decimals with the same number of decimal places • use a standard algorithm to subtract decimals with a different number of decimal places • use estimation and rounding to check the reasonableness of answers when subtracting decimals
	Adding whole numbers of any size	1	Using a formal written algorithm for addition calculations involving numbers of any size (no carrying)	• apply algorithms to solve problems without carrying, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems • use estimation or reverse operation to check the reasonableness of solutions
		2	Using a formal written algorithm for addition calculations involving numbers of any size (with carrying)	• apply algorithms to solve problems with carrying in 1 or more places, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems • use estimation or reverse operation to check the reasonableness of solutions
	Subtracting whole numbers of any size	1	Using a formal written algorithm to record subtraction calculations involving numbers of any size (without decomposing)	• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions
		2	Using a formal written algorithm to record subtraction calculations involving numbers of any size (with decomposing)	• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems • use estimation or reverse operation to check the reasonableness of solutions

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.4 represent and solve problems involving the addition and subtraction of whole numbers and decimal numbers, using estimation and algorithms**				
Add/subtract whole and decimal numbers	Solve addition word problems, numbers any size	1	Solving addition word problems involving numbers of any size	• select and apply efficient mental strategies to solve word problems • select and apply efficient written strategies to solve word problems • use a calculator to solve word problems • interpret words that indicate the required operation • justify the choice of strategy for a given calculation
	Solve subtraction word problems, numbers any size	1	Solving subtraction word problems involving numbers of any size	• select and apply efficient mental strategies to solve word problems • select and apply efficient written strategies to solve word problems • use a calculator to solve word problems • interpret words that indicate the required operation • justify the choice of strategy for a given calculation
	Adding/ subtracting word problems, numbers any size	1	Solving word problems requiring both addition and subtraction involving numbers of any size	• select and apply efficient mental strategies to solve word problems • select and apply efficient written strategies to solve word problems • justify the use digital technologies to solve word problems • interpret words that indicate the required operation/s • justify the choice of strategy for a given calculation
Addition and Subtraction **B2.5 add and subtract fractions with like and unlike denominators, using appropriate tools, in various contexts**				
Adding and subtracting fractions	Add fractions with related denominators	1	Adding proper fractions with related denominators and answers less than 1 whole	• add proper fractions where the denominators are related • model and represent strategies, including using diagrams and written representations • use knowledge of equivalence to simplify answers when adding fractions
		2	Adding simple fractions with related denominators	• add fractions where the denominators are related • use knowledge of equivalence to simplify answers when adding fractions • where the answer is greater than 1 convert the fraction to a mixed number
		3	Adding fractions, including mixed numbers, with related denominators	• add fractions, including mixed numbers, where the denominators are related • convert an answer that is an improper fraction to a mixed number • use knowledge of equivalence to simplify answers when adding fractions • recognize that improper fractions may sometimes make calculations involving mixed numbers easier

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

Mathletics

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.5 add and subtract fractions with like and unlike denominators, using appropriate tools, in various contexts**				
Adding and subtracting fractions	Add fractions with unrelated denominators	1	Adding fractions and mixed numbers with unrelated denominators	• add fractions, including mixed numbers, where the denominators are unrelated by finding common denominators • model and represent strategies, including using diagrams and written representations • convert an answer that is an improper fraction to a mixed number • use knowledge of equivalence to simplify answers when adding fractions • recognize that improper fractions may sometimes make calculations involving mixed numbers easier
	Subtract fractions with related denominators	1	Subtracting proper fractions with related denominators and answers less than 1 whole	• subtract proper fractions where the denominators are related • model and represent strategies, including using diagrams and written representations • use knowledge of equivalence to simplify answers when subtracting fractions
		2	Subtracting simple fractions with related denominators	• subtract fractions where the denominators are related • use knowledge of equivalence to simplify answers when subtracting fractions • where the answer is greater than 1 convert the fraction to a mixed number
		3	Subtracting fractions, including mixed numbers, with related denominators	• subtract fractions, including mixed numbers, where the denominators are related • convert an answer that is an improper fraction to a mixed number • use knowledge of equivalence to simplify answers when subtracting fractions • recognize that improper fractions may sometimes make calculations involving mixed numbers easier
	Subtract fractions with unrelated denominators	1	Subtracting fractions and mixed numbers with unrelated denominators	• subtract fractions, including mixed numbers, where the denominators are unrelated by finding common denominators • model and represent strategies, including using diagrams and written representations • convert an answer that is an improper fraction to a mixed number • use knowledge of equivalence to simplify answers when subtracting fractions • recognize that improper fractions may sometimes make calculations involving mixed numbers easier

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction **B2.5 add and subtract fractions with like and unlike denominators, using appropriate tools, in various contexts**				
Adding and subtracting fractions	Add and subtract fractions, related denominators	1	Adding and subtracting proper fractions with related denominators and answers less than 1 whole	• add and subtract proper fractions where the denominators are related • model and represent strategies, including using diagrams and written representations • use knowledge of equivalence to simplify answers when adding and subtracting fractions
		2	Adding and subtracting fractions including mixed numbers, with related denominators	• add and subtract fractions where the denominators are related • use knowledge of equivalence to simplify answers when adding and subtracting fractions • where the answer is greater than 1 convert the fraction to a mixed number
	Add and subtract fractions, unrelated denominators	1	Adding and subtracting fractions and mixed numbers with unrelated denominators	• add and subtract fractions, including mixed numbers, where the denominators are unrelated by finding common denominators • model and represent strategies, including using diagrams and written representations • convert an answer that is an improper fraction to a mixed number • use knowledge of equivalence to simplify answers when adding and subtracting fractions • recognize that improper fractions may sometimes make calculations involving mixed numbers easier
Multiplication and Division **B2.6 represent composite numbers as a product of their prime factors, including through the use of factor trees**				
Prime and composite numbers	Understand & identify prime and composite numbers	1	Introducing prime and composite numbers	• establish and define prime numbers • establish and define composite numbers • know and recall all prime numbers up to 19
		2	Identifying prime and composite numbers	• determine whether a number is prime, composite or neither • explain whether a whole number is prime, composite or neither by finding the number of factors, eg '13 has two factors (1 and 13) and therefore is prime', '21 has more than two factors (1, 3, 7, 21) and therefore is composite', '1 is neither prime nor composite as it has only one factor, itself'

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.7 represent and solve problems involving the multiplication of three-digit whole numbers by decimal tenths, using algorithms				
Multiply whole numbers & decimal tenths	Multiply whole numbers & tenths, models	1	Representing multiplication of decimals to tenths and whole numbers using objects and pictorial models, including area models	• represent multiplication of decimals to tenths and whole numbers using objects and pictorial models, including area models
	Multiply whole numbers & tenths, mental strategies	1	Multiplying tenths and whole numbers using mental strategies	• use efficient mental strategies to multiply tenths and whole numbers
Multiplication and Division B2.9 multiply whole numbers by proper fractions, using appropriate tools and strategies				
Multiplying whole numbers and fractions	Multiplying whole numbers and proper fractions	1	Multiplying proper fractions by whole numbers using models and diagrams	• apply and extend previous understandings of multiplication to multiply a fraction by a whole number supported by models and/or diagrams, eg 2/5 × 3 = 2/5 + 2/5 + 2/5 = 6/5 = 1 1/5 • use repeated addition to multiply simple fractions by whole numbers, eg 2/5 × 3 = 2/5 + 2/5 + 2/5 = 6/5 = 1 1/5 • develop a rule for multiplying simple fractions by whole numbers, eg 2/5 × 3 = 2 × 3 /5 = 6/5 = 1 1/5 • solve word problems involving multiplication of fractions by whole numbers, including area and length problems
	Multiply fractions by whole numbers, word problems	1	Solving word problems involving multiplication of fractions by whole numbers using models and equations	• solve word problems involving multiplication of fractions by whole numbers using models
	Multiply fraction & whole number, repeat addition	1	Multiplying a fraction and a whole number using repeated addition	• multiply a fraction and a whole number using repeated addition

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.10 divide whole numbers by proper fractions, using appropriate tools and strategies				
Dividing whole numbers by fractions	Dividing whole numbers by proper fractions	1	Dividing a positive whole number by proper fraction	• determine the effect of dividing by a number with magnitude less than 1 • divide a positive whole number by a unit fraction using diagrams to support • divide a positive whole number by a proper fraction (where the answer is a whole number) using diagrams to support • divide a positive whole number by any proper fraction using diagrams to support • demonstrate that dividing by a fraction is equal to multiplying by its reciprocal • develop a rule for dividing by a fraction
Multiplication and Division B2.11 represent and solve problems involving the division of decimal numbers up to thousandths by whole numbers up to 10, using appropriate tools and strategies				
Dividing decimals and whole numbers	Dividing decimals to thousandths and whole numbers	1	Dividing whole numbers and decimals of up to 2 decimal places using mental strategies	• divide decimals by a one-digit whole number where the result is a terminating decimal, eg 5.25 ÷ 5 = 1.05 • solve word problems involving the division of decimals, including those involving money • use estimation and rounding to check the reasonableness of answers when dividing decimals
		2	Dividing whole numbers and decimals up to 2 places using the standard algorithm	• divide whole numbers by decimals up to 2 places • divide a decimal number up to hundredths by another decimal number up to hundredths
Multiplication and Division B2.12 solve problems involving ratios, including percents and rates, using appropriate tools and strategies				
Solving problems involving ratios	Solving problems with unit rates	1	Developing the unitary method to find a quantity given a ratio	• develop the unitary method to find a quantity given a ratio
		2	Applying the unitary method to ratio problems	• apply the unitary method to ratio problems
	Expressing simple ratios as percents	1	Expressing simple ratios as a percentage	• find a percent of a quantity as a rate per 100, eg 30% of a quantity means 30/100 times the quantity

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.1 identify and describe repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and specify which growing patterns are linear**				
ID & describe patterns, including linear	Patterns: whole numbers, fractions, decimals	1	Continuing and creating sequences involving whole numbers, fractions and decimals	• describe the rule used to create the sequence • continue and create number patterns, with and without the use of digital technologies, using whole numbers, fractions and decimals, eg 1/4, 1/8, 1/16, ... or 1.25, 2.5, 5 ... • describe how number patterns have been created and how they can be continued • create simple shape patterns using concrete materials • find missing terms in a number sequence
Patterns **C1.2 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**				
Creating patterns, including linear	Interpret & create tables of values, 2 operations	1	Interpreting and creating a table of values for number patterns involving 2 operations	• complete a table of values resulting from patterns involving 2 operations • describe the pattern in a variety of ways and record descriptions in words • interpret explanations written by peers and teachers that accurately describe shape and number patterns • use the rule to predict the next few terms and predict whether a particular value will be in the pattern
Patterns **C1.3 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**				
Creating patterns, including linear	Pattern rules: linear patterns	1	Generating a linear sequence given the nth term rule	• Generate the first few terms of a linear sequence given the nth term rule • use the nth term rule to find missing terms of the sequence (eg 100th term) • use the nth term rule to determine whether a number exists in a sequence
		2	Finding the nth term of simple linear sequences (increasing and whole number coefficient on n)	• know that the position-to-term rule, written algebraically, is known as the nth term rule of a sequence • understand how the term-to-term rule can help to identify the nth term
		3	Developing and representing the general term of a linear growing pattern	• develop and represent the general term of a linear growing pattern, using algebraic expressions involving 1 operation, eg the general term for the sequence 4, 5, 6, 7, ... can be written algebraically as n + 3, where n represents the term number;- the general term for the sequence 5, 10, 15, 20, ... can be written algebraically as 5n, where n represents the term number

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.3 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**				
Creating patterns, including linear	Interpreting and creating number patterns	1	Interpreting and creating number patterns involving 1 operation in the term-to-term rule	• interpret explanations written by peers and teachers that accurately describe number patterns • use the rule to predict the next few terms and predict whether a particular value will be in the pattern • find missing terms in the number sequence

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Variables and Expressions **C2.1 add monomials with a degree of 1 that involve whole numbers, using tools**				
Adding monomials, degree of 1	Equivalent addition expressions	1	Using equivalent algebraic expressions involving addition	• recognize and use equivalent algebraic expressions using algebraic symbols and words involving addition
Variables and Expressions **C2.2 evaluate algebraic expressions that involve whole numbers and decimal tenths**				
Evaluating algebraic expressions	Evaluate algebraic expressions with whole numbers	1	Evaluating algebraic expressions using natural numbers	• evaluate algebraic expressions using natural numbers
Equalities and Inequalities **C2.3 solve equations that involve multiple terms and whole numbers in various contexts, and verify solutions**				
Solving equations with multiple terms	Solving 2-step linear equations	1	Solving linear equations using inverse operations involving 2 steps with mixed operations with positive integer solutions (pronumeral always in numerator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with positive integer solutions (pronumeral always in numerator position)
		2	Solving linear equations using inverse operations involving 2 steps with mixed operations with positive integer solutions (pronumeral in numerator or denominator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with positive integer solutions (pronumeral in numerator or denominator position)

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

D. Data

D1. Manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Visualization **D1.3 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**				
Graphs: histograms, broken-line graphs	Constructing broken-line graphs	1	Constructing a line graph using a scale of many-to-one correspondence	• construct a line graph using a scale of many-to-one correspondence, with and without the use of digital technologies • name and label the horizontal and vertical axes when constructing graphs • choose an appropriate title to describe the data represented in a data display • determine an appropriate scale of many-to-one correspondence to represent the data in a data display • mark equal spaces on the axes when constructing graphs, and use the scale to label the markers • interpret data in line graph representing primary data; ask and answer questions related to the data in the display; draw conclusions
Data Analysis **D1.5 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 spread and central tendency	Measures of spread: range	1	Introducing the range	• calculate the range for a set of data represented as a list or in a data display • compare ranges in sets of data; discuss variations in range
	Measures of spread/central tendency: data displays	1	Calculating measures of location (mean, median and mode) and the range for data represented in a variety of statistical displays, including frequency distribution tables, frequency histograms, stem-and-leaf plots and dot plots	• calculate measures of location (mean, median and mode) and the range for data represented in a variety of statistical displays, including frequency distribution tables, frequency histograms, stem-and-leaf plots and dot plots
	Comparing measures of central tendency and spread	1	Comparing measures of central tendency and spread across data sets and data displays	• compare similarities and differences between two related sets of data, using a variety of strategies (eg, by representing the data using tally charts, stem-and-leaf plots, double bar graphs, or broken-line graphs; by determining measures of central tendency [ie, mean, median, and mode]; by describing the shape of a data set across its range of values).

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

D. Data

D1. Manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Analysis **D1.6 analyze 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**				
Analyze histograms & broken-line graphs	Reading and interpreting data in a histogram	1	Reading and interpreting data in a histogram	• read and interpret data in a histogram
	Interpreting data in a broken-line graph	1	Interpreting primary and secondary data in a line graph	• interpret line graphs using the scales on the axes • describe and interpret data presented in line graphs • identify and describe relationships that can be observed in data displays

D2. Probability - describe the likelihood that events will happen, and use that information to make predictions

Quest	Learning Journey	Steps	Content	Detail
Probability **D2.1 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	1	Describing probability of a single event using fractions, decimals and percentages	• list the outcomes for chance experiments where the outcomes are not equally likely to occur and assign experimental probabilities to the outcomes using fractions • use knowledge of equivalent fractions, decimals and percentages to assign probabilities to the likelihood of outcomes within concrete examples • explain real-life events in the context of probabilities • use the terminology 'theoretical probability' and/ or 'relative frequency' as the value given by the formula: number of times named outcome(s) did happen / total number of trials

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

D. Data

D2. Probability - describe the likelihood that events will happen, and use that information to make predictions

Quest	Learning Journey	Steps	Content	Detail
Probability D2.2 determine and compare the theoretical and experimental probabilities of two independent events happening				
Probability: two independent events	Identifying the sample space: 2 independent events	1	Identifying the sample space for a probability experiment involving 2 independent events	• identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving 2 independent events
	Understanding independent events	1	Understanding that independent events have a set probability that do not rely on previous events	• understand that independent events have a set probability that do not rely on previous events • explore examples of independent events, eg consecutive rolls of dice
	Interpreting tree diagrams	1	Interpreting tree diagrams	• use a tree diagram to describe all possible combinations or outcomes for two or more independent events

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Geometric Reasoning **E1.1 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	1	Classifying quadrilaterals by their features	• explore, by measurement angle properties of squares, rectangles, parallelograms and rhombuses • select and classify a two-dimensional shape from a description of its features including parallel and perpendicular lines • recognize that two-dimensional shapes can be classified in more than 1 way • explain the difference between regular and irregular shapes
		2	Classifying quadrilaterals using a variety of strategies	• classify two-dimensional figures in a hierarchy based on properties • interpret a hierarchy diagram of two-dimensional shapes and their properties • use Venn diagrams to record classifications • interpret classifications represented using Venn diagrams
	Investigating diagonals of special quadrilaterals	1	Investigating diagonals of special quadrilaterals	• identify and name 'diagonals' of special quadrilaterals • recognize the endpoints of the diagonals of a quadrilateral as the vertices of the shape • determine and draw all the diagonals of quadrilaterals • compare and describe diagonals of different quadrilaterals • use measurement to determine which of the special quadrilaterals have diagonals that are equal in length • determine whether any of the diagonals of a particular shape are also lines (axes) of symmetry of the shape
Location and Movement **E1.3 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	Understand the Cartesian plane, 4 quadrants	1	Introducing the Cartesian coordinate system	• recognize that the number plane consists of a horizontal axis (x-axis) and a vertical axis (y-axis), creating 4 quadrants • recognize that the horizontal axis and the vertical axis meet at right angles • identify the point of intersection of the 2 axes as the origin, having coordinates (0, 0)
	Locate points on the Cartesian plane, 4 quadrants	1	Locating points on the Cartesian plane	• plot and label points, given coordinates, in all 4 quadrants of the number plane • identify and label each quadrant on a number plane • plot a sequence of coordinates to create a picture • identify and record the coordinates of given points in all 4 quadrants of the number plane • recognize that the order of coordinates is important when locating points on the number plane, eg (2, 3) is a location different from (3, 2)
	Plot translations of points on the Cartesian plane	1	Plotting transformations of points on the coordinate plane	• plot and state the coordinates of the image of a point on the coordinate plane resulting from 1 or more translations

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Location and Movement E1.4 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	1	Identifying combinations of transformations	• identify combinations of up to 3 transformations used to move a shape from 1 position to another • perform combinations of up to 3 transformations to move a shape from 1 position to another without the use of digital technology • perform combinations of up to 3 transformations to move a shape from 1 position to another using digital technology • explore the equivalence of one-step transformations and combinations of transformations used to move a shape from 1 position to another

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
The Metric System **E2.1 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**				
Converting metric units	Converting metric units of length	1	Converting between common metric units of length up to 3 decimal places	• understand the meaning of metric prefixes, eg kilo-, centi- and milli- • convert between metres and kilometres • convert between millimetres, centimetres and metres to compare lengths and distances • relate the multiplicative relationship between centimetres and metres, metres and kilometres • explain and use the relationship between the size of a unit and the number of units needed to assist in determining whether multiplication or division is required when converting between units
	Converting metric units of mass	1	Converting between standard metric units of mass up to 3 decimal places	• understand the meaning of metric prefixes, eg kilo-, centi-, milli- • convert between grams and kilograms and vice versa • convert between kilograms and tonnes and vice versa • convert among grams, kilograms and tonnes • solve problems using different units of mass
	Converting metric units of capacity	1	Converting between common metric units of capacity (to 3 decimal places)	• convert between millilitres and litres • explain and use the relationship between the size of a unit and the number of units needed to assist in determining whether multiplication or division is required when converting between units
Angles **E2.2 use a protractor to measure and construct angles up to 360˚, and state the relationship between angles that are measured clockwise and those that are measured counter clockwise**				
Angles up to 360°	Measuring angles with a circular protractor	1	Using a circular protractor to understand a 1-degree angle as 1/360 of a turn	• use a circular protractor to understand a 1-degree angle as 1/360 of a turn
Angles **E2.3 use the properties of supplementary angles, complementary angles, opposite angles, and interior and exterior angles to solve for unknown angle measures**				
Solving for unknown angle measures	Supplementary angles	1	Investigating and defining supplementary angles	• investigate, with and without digital technology, adjacent angles that form a straight angle and establish that they add to 180° • define supplementary angles and identify them in diagrams
		2	Calculating consecutive interior angles	• calculate the size of an unknown angle in a diagram and explain how this is done (using consecutive interior angles)

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Angles **E2.3 use the properties of supplementary angles, complementary angles, opposite angles, and interior and exterior angles to solve for unknown angle measures**				
Solving for unknown angle measures	Complementary angles	1	Investigating and defining complementary angles	• investigate, with and without digital technology, adjacent angles that form a right angle and establish that they add to 90° • define complementary angles and identify them in diagrams
		2	Calculating complementary angles	• calculate the size of an unknown angle in a diagram and explain how this is done (using complementary angles)
	Opposite angles	1	Exploring opposite angles	• explore the relationship between angles formed when 2 straight lines intersect and identify these as 'opposite angles' • use the equality of opposite angles to find the size of unknown angles in diagrams • use the equality of opposite angles to find the size of unknown angles represented by variables in diagrams
	Calculating the interior angle sum of a triangle	1	Calculating sum of interior angles of a triangle	• explore through measurement the sum of interior angles of a triangle • calculate an unknown angle represented by a variable within a triangle, given the other 2 angles
	Calculating the exterior angle of a triangle	1	Calculating the exterior angle of a triangle	• explore, through measurement, the relationship between the exterior angle of a triangle and the sum of the opposite 2 interior angles • calculate an unknown angle represented by a variable using the relationship between the exterior angle of a triangle and the sum of the opposite interior angles
Area and Surface Area **E2.4 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	1	Investigating the area of a trapezoid using rectangles	• investigate the area of a trapezoid using rectangles
		2	Finding the area of a trapezoid using the formula	• apply the formula to find the areas of trapezoids of different orientations and shapes, including 4 unequal sides with no right angles, 2 right angles, and isosceles trapezoid • apply the formula to find the area of trapezoids in different orientations which include dimensions that are not necessary to calculate the area

Ontario Curriculum Grades 6

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Area and Surface Area E2.4 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 rhombus	1	Investigating the area of a rhombus using rectangles	• investigate the area of a rhombus using rectangles
		2	Finding the area of a rhombus using the formula	• apply the formula to find the area of rhombuses in different orientations • apply the formula to find the area of rhombuses in different orientations which include dimensions that are not necessary to calculate the area
	Finding the area of a kite	1	Finding the area of a kite using the formula	• apply the formula to find the area of kites in different orientations • apply the formula to find the area of kites in different orientations which include dimensions that are not necessary to calculate the area
	Finding the area of composite shapes	1	Calculating the area of composite shapes constructed from triangles and special quadrilaterals	• apply area formulas for a variety of composite shapes to calculate their area
Area and Surface Area E2.5 create and use nets to demonstrate the relationship between the faces of prisms and pyramids and their surface areas				
Nets: prisms and pyramids	Connecting prisms and pyramids with their nets	1	Connecting prisms and pyramids with their nets	• examine a diagram to determine whether it is or is not the net of a prism or pyramid • explain why a given net will not form a prism or pyramid • visualize and sketch nets for a given prism or pyramid • recognize whether a diagram is a net of a particular prism or pyramid • visualize and name prisms and pyramids, given diagrams of their nets • select the correct diagram of a net for a given prism or pyramid from a group of similar diagrams where the others are not valid nets of the object

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Rational Numbers **B1.1 represent and compare whole numbers up to and including one billion, including in expanded form using powers of ten, and describe various ways they are used in everyday life**				
Represent/ compare numbers to one billion	Reading and writing numbers of any size	1	Reading and writing numbers of any size	• apply an understanding of place value to read numbers of any size • apply an understanding of place value to write numbers of any size
	Comparing and ordering numbers of any size	1	Comparing 2 numbers of any size	• compare 2 numbers of any size using words and symbols <, =, >
		2	Ordering numbers of any size	• arrange numbers of any size in ascending and descending order
	Identifying the place value of numbers of any size	1	Identifying the place value of numbers of any size	• state the place value of digits in numbers of any size • pose and answer questions that extend place value understanding of numbers, eg 'What happens if I rearrange the digits in the number 2 312 345?', 'How can I rearrange the digits to make the largest number?' • recognize different abbreviations of numbers used in everyday contexts, eg $35 M represents $35 000 000 • understand the role of zero as a placeholder • use place value understanding to count by 10 000 and 100 000
	Using place value to partition numbers of any size	1	Using place value to partition numbers of any size	• use place value understanding and models to partition numbers of any size
		2	Using non-standard partitioning with numbers of any size	• partition numbers of any size in non-standard forms
	Rounding numbers	1	Rounding 6-digit numbers	• round 6-digit numbers to any place value
	Understand how place value changes by powers of 10	1	Understanding how place values change by powers of 10 when moving left or right in a number	• understand how place values change by powers of 10 when moving left or right in a number
	Writing numbers with powers of ten	1	Writing the value of a number in a specific place value with powers of 10	• write the value of a number in a specific place value with powers of 10

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

Mathletics

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Rational Numbers B1.2 identify and represent perfect squares, and determine their square roots, in various contexts				
Perfect squares and square roots	Finding square roots of perfect squares	1	Finding square roots of perfect square whole numbers only	• find the square roots of perfect square whole numbers up to 100
	Identifying and representing perfect squares	1	Describing square numbers	• model square numbers and record each number group in numerical and diagrammatic form • explain how square numbers are created • explore square numbers using arrays, grid paper or digital technologies • recognize and explain the relationship between the name 'square' number and the way the pattern of numbers is created
		2	Introducing square numbers	• establish and define the concept of square numbers, including the index notation • generate square numbers up to at least 100 • know and recall square numbers up to and including 100
Rational Numbers B1.3 read, represent, compare, and order rational numbers, including positive and negative fractions and decimal numbers to thousandths, in various contexts				
Represent/ compare/ order rational numbers	Comparing and ordering rational numbers	1	Comparing the relative value of rational numbers, including recording the comparison by using the symbols < and >	• compare the relative value of rational numbers, including recording the comparison by using the symbols < and >
		2	Finding and placing rational numbers on a horizontal or vertical number line diagram	• find and place rational numbers on a horizontal or vertical number line diagram
		3	Placing positive and negative fractions, decimals and mixed numbers on a number line in order to compare	• place positive and negative fractions, decimals and mixed numbers on a number line in order to compare
		4	Writing, interpreting, and explaining statements of order for rational numbers in real-world contexts using < and >	• write statements of order for rational numbers in real-world contexts using < and > • interpret statements of order for rational numbers in real-world contexts using < and > • explain statements of order for rational numbers in real-world contexts using < and >
	Understanding rational numbers	1	Defining rational numbers as any number that can be represented in the form p/q, where p and q are integers and $q \neq 0$	• define rational numbers as any number that can be represented in the form p/q, where p and q are integers and $q \neq 0$

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions, Decimals, and Percents B1.4 use equivalent fractions to simplify fractions, when appropriate, in various contexts				
Simplifying fractions	Simplifying fractions	1	Using common factors to simplify proper fractions to their simplest form	• determine a common factor of the numerator and denominator of a fractions and use to find an equivalent fraction. Repeat until the fraction is reduced to its simplest form • write a fraction in its simplest form using the highest common factor • know that a fraction is reduced to its simplest form when the only common factor of the numerator and denominator is 1
Fractions, Decimals, and Percents B1.5 generate fractions and decimal numbers between any two quantities				
Fractions/ decimal between 2 quantities	Finding a decimal between 2 decimals	1	Finding a decimal between 2 decimals	• find a decimal between 2 decimals
Fractions, Decimals, and Percents B1.6 round decimal numbers to the nearest tenth, hundredth, or whole number, as applicable, in various contexts				
Rounding decimals	Rounding decimals to any place	1	Rounding decimals to any place	• use place value understanding to round decimals to any place
Fractions, Decimals, and Percents B1.7 convert between fractions, decimal numbers, and percents, in various contexts				
Convert fractions, decimals, percents	Equivalent fractions, decimals, and percents	1	Investigating the relationships between fractions, decimals and percentages	• investigate using concrete materials, drawings and calculators, the relationships between decimals, percentages and fractions with denominators of 2, 4, 5, 10, 20, 25, 50 and 100 • record relationships between decimals, percentages and fractions (with denominators 2, 4, 5, 10, 20, 25, 50, 100) • demonstrate understanding using symbolic representation
		2	Representing equivalent fractions, decimals and percentages	• write percentages as fractions in their simplest form • write fractions with denominators that are factors of 100 as percentages by multiplying the numerator and denominator by a common value • write fractions with denominators that are not factors of 100 as percentages by writing as a decimal first, eg using short division, then x100 to write as a percentage • write percentages as decimals and vice versa • represent equivalent fractions, decimals and percentages • select and justify the most appropriate representation of a quantity — fraction, decimal, percentage

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions, Decimals, and Percents B1.7 convert between fractions, decimal numbers, and percents, in various contexts				
Convert fractions, decimals, percents	Representing percentages and decimals	1	Representing percentages and decimals	• write decimals (< 1) to 2 decimal places as percentages • model percentages and decimals using diagrams, eg number line or 100 grid • write decimals as percentages and vice versa
	Representing common fractions as percentages	1	Representing common fractions as percentages	• represent common fractions as percentages and vice versa • model percentages with concrete materials/ drawings, eg using 10x10grid

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Properties and Relationships B2.1 use the properties and order of operations, and the relationships between operations, to solve problems involving whole numbers, decimal numbers, fractions, ratios, rates, and percents, including those requiring multiple steps or multiple operations				
Properties and order of operations	Order of operations, 4 operations	1	Introducing order of operations involving addition and subtraction	• solve number sentences involving addition and subtraction
		2	Introducing order of operations involving multiplication and division	• solve number sentences involving multiplication and division
		3	Introducing order of operations involving all 4 operations	• solve number sentences involving all 4 operations

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Properties and Relationships B2.1 use the properties and order of operations, and the relationships between operations, to solve problems involving whole numbers, decimal numbers, fractions, ratios, rates, and percents, including those requiring multiple steps or multiple operations				
Properties and order of operations	Order of operations, grouping symbols	1	Introducing order of operations involving grouping symbols	• explore the use of brackets and the order of operations in number sentences • use the term 'operations' to describe collectively the processes of addition, subtraction, multiplication and division • recognize that the grouping symbols () and [] are used in number sentences to indicate operations that must be performed first • perform calculations involving grouping symbols without the use of digital technologies
		2	Applying order of operations for mixed operations and grouping symbols	• apply the order of operations to perform calculations involving mixed operations and grouping symbols • investigate whether different digital technologies apply the order of operations • recognize when grouping symbols are not necessary
		3	Introducing order of operations involving multiple grouping symbols	• explore the use of multiple brackets and the order of operations in number sentences • recognize that the grouping symbols () and [] are used in number sentences to indicate operations that must be performed first • perform calculations involving grouping symbols without the use of digital technologies
			Understanding that 0 is the identity element for addition	• understand that 0 is the identity element of addition
	Add/subtract rational numbers using the properties	1	Applying properties of operations as strategies to add and subtract rational numbers	• apply properties of operations as strategies to add and subtract rational numbers, ie fractions, decimals and integers
	Apply the commutative property of multiplication	1	Applying the commutativity law of multiplication to aid mental computation	• apply the commutativity law to aid mental computation
	Apply the associative property of multiplication	1	Applying the associativity law of multiplication to aid in mental computation	• apply the associativity law of multiplication to aid in mental computation
	Apply the distributive property	1	Applying the distributive law to aid in mental computation to expand expressions containing 2 terms within the grouping symbols	• apply the distributive law to aid in mental computation to expand expressions containing 2 terms within the grouping symbols

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Properties and Relationships **B2.1 use the properties and order of operations, and the relationships between operations, to solve problems involving whole numbers, decimal numbers, fractions, ratios, rates, and percents, including those requiring multiple steps or multiple operations**				
Properties and order of operations	Apply the distributive property	2	Solving problems within a given context by applying the distributive law	• solve problems within a given context by applying the distributive law
Math Facts **B2.2 understand and recall commonly used percents, fractions, and decimal equivalents**				
Percent/ fraction/ decimal equivalents	Common percents, fractions, & decimal equivalents	1	Representing common equivalent fractions, decimals and percentages	• recall the relationships between decimals, percentages and fractions with denominators of 2, 4, 5, 10, 20, 25, 50 and 100 • recognize fractions, decimals and percentages as different representations of the same value • interpret and explain the use of fractions, decimals and percentages in everyday contexts • relate equivalence to proportion
Mental Math **B2.3 use mental math strategies to increase and decrease a whole number by 1%, 5%, 10%, 25%, 50%, and 100%, and explain the strategies used**				
Mental math: percents	Use 50%, 10% and 1% to mentally calculate amounts	1	Using 50%, 10% and 1% to mentally calculate amounts	• use 50%, 10%, and 1% as strategies to mentally calculate amounts
	Determine percentages of quantities	1	Determining percentages of quantities (written and mental methods)	• determine percentages of quantities using written and mental strategies
	Increasing and decreasing amounts by percentages	1	Increasing and decreasing amounts by percentages (written and mental methods)	• increase an amount by first calculating the percentage increase value of the original amount, and then adding that result to the original amount • decrease an amount by first calculating the percentage decrease value of the original amount, and then subtracting that result from the original amount

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction B2.4 use objects, diagrams, and equations to represent, describe, and solve situations involving addition and subtraction of integers				
Adding and subtracting integers	Understand adding and subtracting integers	1	Understanding addition and subtraction of integers pictorially	• understand addition and subtraction of integers pictorially
		2	Understanding addition and subtraction of integers symbolically	• understand addition and subtraction of integers symbolically
	Represent adding/ subtracting integers, number line	1	Representing addition and subtraction on a horizontal or vertical number line diagram	• represent addition and subtraction on a horizontal or vertical number line diagram
	Adding and subtracting integers	1	Adding integers	• add integers
		2	Subtracting integers	• subtract integers
		3	Adding and subtracting negative integers	• add and subtract negative integers • understand the way negative integers subtract from something actually adds positively • understand that 9–(–4) = 13 because –4 is 13 away from +9
Addition and Subtraction B2.5 add and subtract fractions, including by creating equivalent fractions, in various contexts				
Add and subtract fractions	Adding fractions, same denominator	1	Adding proper fractions with common denominators	• add proper fractions with common denominators
	Adding fractions, unlike denominator	1	Adding proper fractions with unlike denominators	• add proper fractions with unlike denominators • explain why there must be a common denominator in order to add fractions
	Subtracting fractions, same denominator	1	Subtracting proper fractions with common denominators	• subtract proper fractions with common denominators
	Subtracting fractions, unlike denominator	1	Subtracting proper fractions with unlike denominators	• subtract proper fractions with unlike denominators • explain why there must be a common denominator in order to subtract fractions

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.6 determine the greatest common factor for a variety of whole numbers up to 144 and the lowest common multiple for two and three whole numbers				
GCF and LCM	Finding factors and the greatest common factor	1	Finding factors for whole numbers up to 144	• determine all 'factors' of a given whole number up to 144 • determine the 'highest common factor' (HCF) of 2 whole numbers • determine whether a particular number is a factor of a given number using digital technologies • recognize that when a given number is divided by 1 of its factors, the result must be a whole number
		2	Finding the highest common factor using a list	• find the highest common factor using a list
	Finding multiples and the least common multiple	1	Finding multiples up to 144	• determine 'multiples' of a given whole number • determine the 'lowest common multiple' (LCM) of 2 whole numbers
Multiplication and Division B2.7 evaluate and express repeated multiplication of whole numbers using exponential notation, in various contexts				
Exponential notation	Expressing numbers in exponential notation	1	Writing numerical expressions involving whole-number exponents	• write numerical expressions involving whole-number exponents
		2	Representing repeated multiplication of whole numbers using indices	• represent repeated multiplication of whole numbers using indices • represent expressions given in index form as the repeated multiplication of the base
	Describe/ evaluate numbers in exponential notation	1	Describing numbers written in 'index form' using terms such as 'base', 'power', 'index', 'exponent', 'to the power of', 'squared', 'cubed'	• describe numbers written in 'index form' using terms such as 'base', 'power', 'index', 'exponent', 'to the power of', 'squared', 'cubed' • use index notation to express powers of numbers (positive indices only)
		2	Evaluating numbers expressed as powers of integers	• evaluate numbers expressed as powers of integers

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.8 multiply and divide fractions by fractions, using tools in various contexts				
Multiplying and dividing fractions	Multiplying fractions		Multiplying proper fractions	• determine the effect of multiplying by a number with magnitude less than 1 • multiply proper fractions using written methods • demonstrate multiplication of a fraction by another fraction using a diagram to illustrate the process • solve problems involving multiplying fractions in context • calculate fractions of quantities using mental or written strategies • choose the appropriate equivalent form for mental computation
	Dividing fractions	1	Dividing a proper fraction by a proper fraction	• divide a proper fraction by a proper fraction
Multiplication and Division B2.9 multiply and divide decimal numbers by decimal numbers, in various contexts				
Multiplying and dividing decimals	Multiplying decimals	1	Multiplying decimals using splitting	• multiply decimals using splitting
		2	Multiplying decimals using written/mental methods	• multiply decimals using mental/written methods • compare initial estimates with answers obtained by written methods and check by using a calculator
		3	Multiplying decimals using written method	• multiply decimals up to thousandths using a standard algorithm
	Dividing decimals	1	Dividing a decimal by a decimal with an integer quotient	• divide a decimal by a decimal with an integer quotient using repeated addition • divide a decimal by a decimal with an integer quotient by finding the missing factor
		2	Dividing decimals using written method	• divide decimals up to thousandths using a standard algorithm
	Decimal word problems, multiplying and dividing	1	Solving decimal word problems involving multiplying and dividing	• solve decimal word problems involving multiplying • solve decimal word problems involving dividing

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.10 identify proportional and non-proportional situations and apply proportional reasoning to solve problems				
Proportional/ non-proportional situations	Identifying proportional relationships	1	Determining whether 2 quantities are in a proportional relationship	• determine whether 2 quantities are in a proportional relationship
		2	Recognizing proportional relationships between quantities	• interpret information between 2 quantities and decide if they are in a proportional relationship
	Graphing proportional relationships	1	Graphing proportional relationships	• graph proportional relationships • interpret the unit rate as the slope of the graph
	Identifying the constant of proportionality, table	1	Identifying the constant of proportionality from a table of values	• Identify the constant of proportionality from a table of values • find the missing values from a table using the constant of proportionality

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.1 identify and compare a variety of repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and compare linear growing patterns on the basis of their constant rates and initial values**				
ID/compare patterns, including linear	Comparing pattern rules		Comparing 2 pattern rules	• generate 2 numerical patterns using 2 given rules • identify apparent relationships between corresponding terms, eg given the rules 'Add 3' and 'Add 6' and the starting number 0, generate terms in the resulting sequences, and observe that the terms in 1 sequence are twice the corresponding terms in the other sequence • explain thinking informally
Patterns **C1.2 create and translate repeating, growing, and shrinking patterns involving whole numbers and decimal numbers using various representations, including algebraic expressions and equations for linear growing patterns**				
Create patterns, whole numbers/ decimals	Create patterns, whole numbers/ fractions/ decimals	1	Continuing and creating sequences involving whole numbers, fractions and decimals	• describe the rule used to create the sequence • continue and create number patterns, with and without the use of digital technologies, using whole numbers, fractions and decimals, eg 1/4, 1/8, 1/16, ... or 1.25, 2.5, 5, ... • describe how number patterns have been created and how they can be continued • create simple shape patterns using concrete materials • find missing terms in a number sequence
	Represent the nth term, linear growing pattern	1	Developing and representing the general term of a linear growing pattern	• develop and represent the general term of a linear growing pattern, using algebraic expressions involving 1 operation, eg the general term for the sequence 4, 5, 6, 7, ... can be written algebraically as n + 3, where n represents the term number;- the general term for the sequence 5, 10, 15, 20, ... can be written algebraically as 5n, where n represents the term number
		2	Developing and representing the general term of a linear growing pattern with 2 operations	• develop and represent the general term of a linear growing pattern, using algebraic expressions involving 2 operations

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating, growing, and shrinking patterns involving whole numbers and decimal numbers, and use algebraic representations of the pattern rules to solve for unknown values in linear growing patterns**				
Pattern rules, whole numbers & decimals	Investigate/ extend patterns represented in a table	1	Investigating and extending numeric and geometric patterns represented in a table	• investigate and extend numeric patterns represented in a table • investigate and extend geometric patterns represented in a table
	Find and use the nth term, linear patterns	1	Finding the nth term of linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with decimal coefficients of n	• find the nth term of decreasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with decimal coefficients of n
		2	Using the nth term rule for a linear series	• use the nth term rule to find missing terms of the sequence, eg 100th term • use the nth term rule to determine whether a number exists in a sequence
	Interpret/ create a table of values, 2 operations	1	Interpreting and creating a table of values for number patterns involving 2 operations	• complete a table of values resulting from patterns involving 2 operations • describe the pattern in a variety of ways and record descriptions in words • interpret explanations written by peers and teachers that accurately describe shape and number patterns • use the rule to predict the next few terms and predict whether a particular value will be in the pattern

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Variables and Expressions C2.1 add and subtract monomials with a degree of 1 that involve whole numbers, using tools				
Adding and subtracting monomials	Simplify algebraic expressions, add/subtract	1	Simplifying algebraic expressions that involve addition and subtraction	• extend and apply the laws and properties of arithmetic to algebraic terms and expressions • recognize like terms and add and subtract them to simplify algebraic expressions • verify whether a simplified expression is correct by substituting numbers for pronumerals • connect algebra with the commutative and associative properties of arithmetic to determine that a + b = b + a and (a + b) + c = a + (b + c) • recognize the role of grouping symbols and the different meanings of expressions, such as 2a + 1 and 2(a + 1)
	Using properties to add and subtract monomials	1	Simplifying algebraic expressions that involve addition and subtraction involving properties of commutativity, associativity and grouping symbols	• extend and apply the laws and properties of arithmetic to algebraic terms and expressions • recognize like terms and add and subtract them to simplify algebraic expressions • recognize 'unlike' terms, identifying and classifying them
Variables and Expressions C2.2 evaluate algebraic expressions that involve whole numbers and decimal numbers				
Evaluating algebraic expressions	Evaluating algebraic expressions	1	Evaluating algebraic expressions using natural numbers	• evaluate algebraic expressions using natural numbers
		2	Substituting into algebraic expressions and evaluating the result	• substitute into algebraic expressions and evaluate the result • substitute numerical values into formulas and expressions, including scientific formulas
Equalities and Inequalities C2.3 solve equations that involve multiple terms, whole numbers, and decimal numbers in various contexts, and verify solutions				
Solve equations: whole numbers, decimals	Solving 1-step addition/ subtraction equations	1	Solving linear equations using inverse operations involving 1 step of addition or subtraction with positive integer and non-integer (decimals and fractions) solutions	• solve linear equations using inverse operations involving 1 step of addition or subtraction with positive integer and non-integer (decimals and fractions) solutions
		2	Solving linear equations using inverse operations involving 1 step of addition or subtraction with positive integer and non-integer (decimal and fraction) solutions with pronumeral on right hand side	• solve linear equations using inverse operations involving 1 step of addition or subtraction with positive integer and non-integer (decimal and fraction) solutions with pronumeral on right hand side

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

Mathletics

C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Equalities and Inequalities C2.3 solve equations that involve multiple terms, whole numbers, and decimal numbers in various contexts, and verify solutions				
Solve equations: whole numbers, decimals	Solving 1-step division equations	1	Solving linear equations using inverse operations involving 1 step of division needed with positive integer and non-integer (decimals and fractions) solutions	• solve linear equations using inverse operations involving 1 step of division needed with positive integer and non-integer (decimals and fractions) solutions
		2	Solving linear equations using inverse operations involving 1 step of division needed with positive integer and non-integer (decimal and fraction) solutions with pronumeral on right hand side	• solve linear equations using inverse operations involving 1 step of division needed with positive integer and non-integer (decimal and fraction) solutions with pronumeral on right hand side
	Solving 1-step multiplication equations	1	Solving linear equations using inverse operations involving 1 step of multiplication needed with positive integer and non-integer (decimal and fraction) solutions (pronumeral in numerator position)	• solve linear equations using inverse operations involving 1 step of multiplication needed with positive integer and non-integer (decimal and fraction) solutions (pronumeral in numerator position)
	Solving 1-step equations, mixed operations	1	Solving linear equations using inverse operations involving 1 step with mixed operations with positive integer and non-integer (decimal and fraction) solutions	• solve linear equations using inverse operations involving 1 step with mixed operations with positive integer and non-integer (decimal and fraction) solutions
		2	Solving linear equations using inverse operations involving 1 step with mixed operations with positive integer and non-integer (decimal and fraction) solutions with pronumeral on right hand side	• solve linear equations using inverse operations involving 1 step with mixed operations with positive integer and non-integer (decimal and fraction) solutions with pronumeral on right hand side
	Solving 2-step equations, mixed operations	1	Solving linear equations using inverse operations involving 2 steps with mixed operations with positive integer and non-integer solutions (pronumeral always in numerator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with positive integer and non-integer solutions (pronumeral always in numerator position)
		2	Solving linear equations using inverse operations involving 2 steps with mixed operations with positive integer and non-integer solutions (pronumeral always in numerator position) with pronumeral on the right hand side	• solve linear equations using inverse operations involving 2 steps with mixed operations with positive integer and non-integer solutions (pronumeral always in numerator position) with pronumeral on the right hand side
		3	Solving linear equations using inverse operations involving 2 steps with mixed operations with positive integer and non-integer solutions (pronumeral in numerator or denominator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with positive integer and non-integer solutions (pronumeral in numerator or denominator position)

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Equalities and Inequalities C2.3 solve equations that involve multiple terms, whole numbers, and decimal numbers in various contexts, and verify solutions				
Solve equations: whole numbers, decimals	Solving 2-step equations, mixed operations	4	Solving linear equations using inverse operations involving 2 steps with mixed operations with positive integer and non-integer solutions (pronumeral in numerator or denominator position) with pronumeral on right hand side	• solve linear equations using inverse operations involving 2 steps with mixed operations with positive integer and non-integer solutions (pronumeral in numerator or denominator position) with pronumeral on right hand side
	Solving linear equations, variables on both sides	1	Solving linear equations (positive integer, fraction or decimal coefficients) using inverse operations involving pronumerals on both sides of the equation	• solve linear equations (positive integer, fraction or decimal coefficients) using inverse operations involving pronumerals on both sides of the equation
	Solving linear equations with grouping symbols	1	Solving linear equations (positive integer, fraction or decimal coefficients) using inverse operations involving expanding brackets	• solve linear equations (positive integer, fraction or decimal coefficients) using inverse operations involving expanding brackets
	Using substitution to verify solutions	1	Checking solutions to equations by substituting	• check solutions to equations by substituting
Equalities and Inequalities C2.4 solve inequalities that involve multiple terms and whole numbers, and verify and graph the solutions				
Solve inequalities	Verifying solutions of inequalities	1	Checking whether an inequality is true using substitution	• check whether an inequality is true using substitution

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Visualization **D1.3 select from among a variety of graphs, including circle 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**				
Selecting graphs and displaying data	Constructing histograms	1	Constructing histograms for discrete data sets where grouping is required	• construct histograms for discrete data sets where grouping is required
	Constructing dot plots	1	Constructing dot plots	• construct dot plots • explain the importance of aligning data points when constructing dot plots
	Constructing stacked-bar graphs	1	Constructing divided bar graphs without the use of digital technology	• construct divided bar graphs without the use of digital technology • calculate the length of the bar required for each section of divided bar graphs
Data Analysis **D1.6 analyze different sets of data presented in various ways, including in circle 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**				
Analyzing data displays	Identifying skewed and symmetrical sets of data	1	Identifying skewed and symmetrical sets of data	• identify skewed and symmetrical sets of data
	Analyzing misleading data displays	1	Analyzing graphical displays to recognize features that may have been manipulated to cause a misleading interpretation and/or support a particular point of view	• analyze graphical displays to recognize features that may have been manipulated to cause a misleading interpretation and/or support a particular point of view • explain and evaluate the effect of misleading features on graphical displays • identify terms that can be used to describe misleading features on a data display

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

D. Data

D2. Probability - describe the likelihood that events will happen, and use that information to make predictions

Quest	Learning Journey	Steps	Content	Detail
Probability **D2.1 describe the difference between independent and dependent events, and explain how their probabilities differ, providing examples**				
Understand independent/ dependent events	Understanding independent and dependent events	1	Understanding that dependent events have a probability that changes according to previous events	• understand that dependent events have a probability that changes according to previous events • explore examples of dependent events, eg drawing cards from a deck
Probability **D2.2 determine and compare the theoretical and experimental probabilities of two independent events happening and of two dependent events happening**				
Probability independent/ dependent events	Determining theoretical probability, tree diagrams	1	Determining the theoretical probability of a series of events using tree diagrams	• determine the theoretical probability of a series of a events using a tree diagram (diagram given) • determine the theoretical probability of a series of a events using a tree diagram (diagram not given, needs to be constructed)
	Identifying the sample space, 2 independent events	1	Identifying the sample space for a probability experiment involving 2 independent events	• identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving 2 independent events
	Finding experimental and theoretical probabilities	1	Understanding that independent events have a set probability that do not rely on previous events	• understand that independent events have a set probability that do not rely on previous events • explore examples of independent events, eg consecutive rolls of dice
	Comparing experimental and theoretical probability	1	Comparing and discussing the results of a chance experiment (experimental probability results) with the theoretical probability	• compare and discuss the results of a chance experiment (experimental probability results) with the theoretical probability • compare the expected frequencies of outcomes of chance experiments with observed frequencies, including where the outcomes are not equally likely
	Probability: independent/ dependent combined events	1	Calculating the probability of independent and dependent combined events, including using tree diagrams and other representations, and knowing the underlying assumptions	• calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions • generate frequencies for compound events by using simulation

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Geometric Reasoning E1.1 describe and classify cylinders, pyramids, and prisms according to their geometric properties, including plane and rotational symmetry				
Cylinders, pyramids, and prisms	Comparing, describing, and naming prisms	1	Comparing, describing and naming prisms	• identify and determine the number of pairs of parallel faces of three-dimensional objects, eg 'A rectangular prism has three pairs of parallel faces' • identify the 'base' of prisms • recognize that the base of a prism is not always the face where the prism touches the ground • name prisms according to the shape of their base, eg rectangular prism • recognize a cube as a special type of prism
	Comparing, describing, and naming pyramids	1	Comparing, describing and naming pyramids	• identify and determine the number of faces of three-dimensional objects • identify the 'base' of pyramids • recognize that the base of a pyramid is not always the face where the prism touches the ground • name pyramids according to the shape of their base, eg square pyramid
	Investigating properties of prisms and pyramids	1	Investigating properties of prisms and pyramids	• identify, describe and compare the properties of prisms and pyramids, including: number of faces, shape of faces, number and type of identical faces, number of vertices, number of edges • describe similarities and differences between prisms and pyramids, eg between a triangular prism and a hexagonal prism, between a rectangular prism and a rectangular(-based) pyramid • determine that the faces of prisms are always rectangles except the base faces, which may not be rectangles • determine that the faces of pyramids are always triangles except the base face, which may not be a triangle • use the term 'apex' to describe the highest point above the base of a pyramid or cone

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
The Metric System E2.2 solve problems involving perimeter, area, and volume that require converting from one metric unit of measurement to another				
Converting units of length, area, volume	Converting units of length	1	Converting between common metric units of length up to 3 decimal places	• understand the meaning of metric prefixes, eg kilo-, centi- and milli- • convert between metres and kilometres • convert between millimetres, centimetres and metres to compare lengths and distances • relate the multiplicative relationship between centimetres and metres, metres and kilometres • explain and use the relationship between the size of a unit and the number of units needed to assist in determining whether multiplication or division is required when converting between units
	Converting units of area	1	Converting between different metric units of area (square millimetres, square centimetres, square metres, square kilometres, hectares)	• convert between square millimetres and square centimetres and vice versa • convert between square centimetres and square metres and vice versa • convert between square metres and hectares and vice versa • convert between square metres and square kilometres and vice versa
	Converting units of volume	1	Converting between metric units of volume and capacity (mL, L, kL and ML)	• convert between metric units of volume: $1\ km^3 = 1\ 000\ 000\ m^3$, $1\ m^3 = 10\ 000\ cm^3$, $1\ cm^3 = 1000\ mm^3$ • convert between metric units of capacity: 1 ML = 1 000 000 L, 1 kL = 1000 L, 1 L = 1000 mL • convert between metric units of volume and capacity: $1\ cm^3 = 1$ mL, $1\ m^3 = 1000$ L

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Circles **E2.3 use the relationships between the radius, diameter, and circumference of a circle to explain the formula for finding the circumference and to solve related problems**				
Finding the circumference of a circle	Parts of a circle	1	Introducing parts of a circle: centre, radius, diameter and circumference	• identify and name parts of circles • create a circle by finding points that are all the same distance from a fixed point
	Finding the circumference of a circle, formula	1	Finding the circumference of a circle using a formula	• find the circumference of a circle using a formula
Circles **E2.5 show the relationships between the radius, diameter, and area of a circle, and use these relationships to explain the formula for measuring the area of a circle and to solve related problems**				
Finding the area of a circle	Finding the area of a circle, formula	1	Finding the area of a circle using the formula	• apply the formula to find the areas of circles given the radius • apply the formula to find the areas of circles given the diameter
		2	Solving real-life problems involving calculating the area of circles	• solve real-life problems involving calculating the area of circles
Volume and Surface Area **E2.7 show that the volume of a prism or cylinder can be determined by multiplying the area of its base by its height, and apply this relationship to find the area of the base, volume, and height of prisms and cylinders when given two of the three measurements**				
Finding the volume: prisms and cylinders	Finding the volume of a cube	1	Finding the volume of a cube using a formula	• find the volume of a cube using a formula given its length, width or height • find the length of a cube given its volume

Ontario Curriculum Grades 7

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Volume and Surface Area E2.7 show that the volume of a prism or cylinder can be determined by multiplying the area of its base by its height, and apply this relationship to find the area of the base, volume, and height of prisms and cylinders when given two of the three measurements				
Finding the volume: prisms and cylinders	Finding the volume of a prism	1	Finding the volumes of rectangular prisms, given their perpendicular heights and the dimensions of their uniform cross-sections	• find the volumes of rectangular prisms, given their perpendicular heights and the dimensions of their uniform cross-sections
		2	Finding the volume of prism with a composite/ irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in the same units	• find the volume of prism with a composite/ irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in the same units
		3	Finding the volume of prism with a composite/ irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in different units	• find the volume of prism with a composite/ irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in different units
		4	Finding the volume of prism with a composite/irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in the same units	• find the volume of prism with a composite/ irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in the same units
		5	Finding the volume of prism with a composite/irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in different units	• find the volume of prism with a composite/ irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in different units
	Finding the height or area, rectangular prism	1	Finding the height or area of the uniform cross-section given the volume in the same units	• find the height or area of the uniform cross-section given the volume in the same units
		2	Finding the height/area of the uniform cross-section given the volume in different units	• find the height/area of the uniform cross-section given the volume in different units

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Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Volume and Surface Area E2.7 show that the volume of a prism or cylinder can be determined by multiplying the area of its base by its height, and apply this relationship to find the area of the base, volume, and height of prisms and cylinders when given two of the three measurements				
Finding the volume: prisms and cylinders	Finding the volume of a triangular prism	1	Finding the volume of a triangular prism given the area of the uniform cross-section and perpendicular height in the same units	• find the volume of a triangular prism given the area of the uniform cross-section and perpendicular height in the same units
		2	Finding the volume of a triangular prism given the area of the uniform cross-section and perpendicular height in different units	• find the volume of a triangular prism given the area of the uniform cross-section and perpendicular height in different units
		3	Finding the volume of triangular prisms, given their perpendicular heights and dimensions of their uniform cross-sections all in the same units	• find the volume of triangular prisms, given their perpendicular heights and dimensions of their uniform cross-sections all in the same units
		4	Finding the volume of triangular prisms, given their perpendicular heights and dimensions of their uniform cross-sections all in different units	• find the volume of triangular prisms, given their perpendicular heights and dimensions of their uniform cross-sections all in different units
	Finding a missing dimension, triangular prism	1	Finding a missing dimension of a triangular prism given the volume in the same units	• find a missing dimension of a triangular prism given the volume in the same units
		2	Finding a missing dimension of a triangular prism given the volume in different units	• find a missing dimension of a triangular prism given the volume in different units

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Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Volume and Surface Area E2.7 show that the volume of a prism or cylinder can be determined by multiplying the area of its base by its height, and apply this relationship to find the area of the base, volume, and height of prisms and cylinders when given two of the three measurements				
Finding the volume: prisms and cylinders	Finding the volume of a cylinder	1	Using the formula to find the volumes of cylinders	• find the volume of a right cylinder given the area of the circle cross-section and perpendicular height in the same units • find the volume of a right cylinder given the area of the circle cross-section and perpendicular height in different units
		2	Finding the volume of right cylinders, given their perpendicular heights and radius/diameter of their circular cross-sections all in the same units	• find the volume of right cylinders, given their perpendicular heights and radius/diameter of their circular cross-sections all in the same units • find the volume of right cylinders, given their perpendicular heights and radius/diameter of their circular cross-sections all in different units
	Finding a missing dimension, cylinder	1	Finding the height or area of the circle cross-section for a right cylinder given the volume in the same units	• find the height or area of the circle cross-section for a right cylinder given the volume in the same units • find the height or area of the circle cross-section for a right cylinder given the volume in different units
		2	Finding the radius, diameter or height of right cylinders, given their volume all in the same units	• find the radius, diameter or height of right cylinders, given their volume all in the same units • find the radius, diameter or height of right cylinders, given their volume all in different units
	Solving volume problems, right prisms & cylinders	1	Solving a variety of practical problems involving the volumes and capacities of right prisms	• solve a variety of practical problems involving the volumes and capacities of right prisms • find the height or area of a prism with a composite/irregular polygon with uniform cross-section given the volume in the same units
		2	Solving a variety of practical problems involving the volume of cylinders	• solve a variety of practical problems involving the volume of cylinders
		3	Solving a variety of practical problems involving the volume and capacity of right prisms and cylinders	• solve a variety of practical problems involving the volumes and capacities of right prisms and cylinders

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Rational and Irrational Numbers B1.1 represent and compare very large and very small numbers, including through the use of scientific notation, and describe various ways they are used in everyday life				
Represent/ compare in scientific notation	Introducing scientific notation	1	Introducing scientific notation for whole numbers	• understand that scientific notation is a way of writing numbers which has 2 parts to it • establish how to write 1, 10, 100, 1000 etc as an exponent of the 10 • write whole numbers as a number between 1 and 10 multiplied by 10, 100, 1000 etc
			Introducing scientific notation for whole numbers	• represent whole numbers in scientific notation
	Converting from scientific to standard notation	1	Converting from scientific notation to standard notation for very large numbers	• convert from scientific notation to standard notation for very large numbers
		2	Converting from scientific notation to standard notation for very small numbers	• convert from scientific notation to standard notation for very small numbers
	Converting from standard to scientific notation	1	Converting from standard notation to scientific notation for very large numbers	• convert from standard notation to scientific notation for very large numbers
		2	Converting from standard notation to scientific notation for very small numbers	• convert from standard notation to scientific notation for very small numbers
Rational and Irrational Numbers B1.2 describe, compare, and order numbers in the real number system (rational and irrational numbers), separately and in combination, in various contexts				
Describe/ compare/order real numbers	Classifying real numbers	1	Describing the real number system by recognizing, defining and distinguishing properties of natural numbers, whole numbers, integers, rational numbers and irrational numbers	• describe the real number system by recognizing, defining and distinguishing properties of natural numbers, whole numbers, integers, rational numbers and irrational numbers
	Comparing rational and irrational numbers		Using rational approximations of irrational numbers to compare the size of irrational numbers	• use rational approximations of irrational numbers to compare the size of irrational numbers

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

Mathletics

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Rational and Irrational Numbers B1.2 describe, compare, and order numbers in the real number system (rational and irrational numbers), separately and in combination, in various contexts				
Describe/ compare/order real numbers	Classifying numbers as rational or irrational	1	Defining rational numbers as any number that can be represented in the form p/q, where p and q are integers and q ≠ 0	• define rational numbers as any number that can be represented in the form p/q, where p and q are integers and q ≠ 0
		2	Defining irrational numbers	• define irrational numbers as any number that cannot be represented in the form p/q where p and q are integers
		3	Describing, informally, the properties of irrational numbers	• describe, informally, the properties of irrational numbers
		4	Distinguishing between rational and irrational numbers	• distinguish between rational and irrational numbers
Rational and Irrational Numbers B1.3 estimate and calculate square roots, in various contexts				
Estimate and calculate square roots	Locate non-perfect square roots between 2 integers	1	Approximating the location of irrational numbers on a number line	• approximate the location of irrational numbers on a number line
	Square roots of non-perfect squares	1	Estimating the square root of non-square numbers	• estimate the square root of a non-square number up to 100 • estimate the square root of a non-square number up to 100 using a number line to estimate
		2	Finding square roots of non-perfect squares	• use a calculator to calculate approximations of square roots of positive integers and positive non-integers • mentally determine between which 2 whole numbers lies the square root of a non-perfect square number up to 100 • estimate the square root of a non-perfect square number up to 100 • understand why entering the square root of a negative number in a calculator returns an error message

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions, Decimals, and Percents **B1.4 use fractions, decimal numbers, and percents, including percents of more than 100% or less than 1%, interchangeably and flexibly to solve a variety of problems**				
Fraction/ decimal/ percent equivalence	Converting decimals to percents	1	Converting decimals to percentages	• convert decimals with up to 2 decimal places to percentages containing whole numbers only • convert decimals with more than 2 decimal places to percentages, writing answers as a percentage with decimal parts • convert decimals with 3–4 decimal places to percentages, writing answers in fraction form • convert decimals with 5 or more decimal places to percentages, writing answers in decimal form rounded to an appropriate degree of accuracy
	Converting decimals to fractions	1	Converting terminating decimals less than 1 into fractions	• convert terminating decimals less than 1 into fractions
		2	Converting recurring decimals into fractions	• convert recurring decimals into fractions
	Converting fractions to decimals	1	Converting fractions to terminating decimals using division	• convert fractions to terminating decimals using division • convert improper fractions to terminating decimals using division • convert mixed numbers to terminating decimals using division
		2	Converting fractions to repeating decimals using division	• convert fractions to repeating decimals using division • convert improper fractions to repeating decimals using division • convert mixed numbers to repeating decimals using division
	Converting fractions to percents	1	Converting fractions to terminating percentages by manipulating the denominator to 100	• convert unit fractions to terminating percentages by manipulating the denominator to be 100 • convert improper fractions to terminating percentages by manipulating the denominator to be 100 • convert mixed numbers to terminating percentages by manipulating the denominator to be 100
		2	Converting fractions to terminating percentages using division	• convert fractions to terminating percentages using division • convert improper fractions to terminating percentages using division • convert mixed numbers to terminating percentages using division
		3	Converting fractions to repeating percentages using division	• convert fractions to repeating percentages using division • convert improper fractions to repeating percentages using division • convert mixed numbers to repeating percentages using division

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Understanding Practice and Fluency (UPF)

B. Number

B1. Number Sense - demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

Quest	Learning Journey	Steps	Content	Detail
Fractions, Decimals, and Percents B1.4 use fractions, decimal numbers, and percents, including percents of more than 100% or less than 1%, interchangeably and flexibly to solve a variety of problems				
Fraction/ decimal/ percent equivalence	Converting percents to fractions	1	Converting percentages less than or equal to 100% into fractions	• convert percentages less than or equal to 100% into fractions
		2	Converting percentages greater than 100% to mixed numbers	• convert percentages greater than 100% to mixed numbers
		3	Converting percentages greater than 100% to improper fractions	• convert percentages greater than 100% to improper fractions
	Converting percents to decimals	1	Converting terminating percentages less than 100% into a decimal	• convert terminating percentages less than 100% into a decimal
		2	Converting terminating percentages greater than or equal to 100% into a decimal	• convert terminating percentages greater than or equal to 100% into a decimal
		3	Converting repeating percentages less than 100% into a decimal	• convert repeating percentages less than 100% into a decimal
		4	Converting repeating percentages greater than or equal to 100% into a decimal	• convert repeating percentages greater than or equal to 100% into a decimal

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Properties and Relationships **B2.1 use the properties and order of operations, and the relationships between operations, to solve problems involving rational numbers, ratios, rates, and percents, including those requiring multiple steps or multiple operations**				
Using properties and order of operations	Solving problems with the order of operations	1	Adding and subtracting integers with order of operations	• add and subtract integers with order of operations
		2	Applying the order of operations to evaluate expressions involving integers with no exponents or radicals	• apply the order of operations to evaluate expressions involving integers with no exponents or radicals
	Applying the properties of operations	1	Applying the commutative property of multiplication to aid mental computation	• apply the commutative property to aid mental computation
		2	Applying the associative property of multiplication to aid in mental computation	• apply the associative property of multiplication to aid in mental computation
		3	Applying the distributive property to aid in mental computation to expand expressions containing 2 terms within the grouping symbols	• apply the distributive property to aid in mental computation to expand expressions containing 2 terms within the grouping symbols
		4	Applying the distributive property to aid in mental computation to expand expressions containing 3 or more terms within the grouping symbols	• apply the distributive property to aid in mental computation to expand expressions containing 3 or more terms within the grouping symbols
		5	Solving problems within a given context by applying the distributive property	• solve problems within a given context by applying the distributive property
Math Facts **B2.2 understand and recall commonly used square numbers and their square roots**				
Recall square numbers and square roots	Recalling square numbers and their square roots	1	Recognizing the link between squares and square roots	• recognize the link between squares and square roots

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Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Mental Math **B2.3 use mental math strategies to multiply and divide whole numbers and decimal numbers up to thousandths by powers of ten, and explain the strategies used**				
Multiply/divide powers of 10 mentally	Multiplying decimals by powers of 10	1	Multiplying decimals by 10	• use a place value chart to multiply decimals by 1000 • recognize that the digits move one place to the left • use zero as a place holder
		2	Multiplying decimals by 100	• recognize that the digits move two places to the left • use zero as a place holder • use a place value chart to multiply decimals by 1000
		3	Multiplying decimals by 1000	• recognize that the digits move three places to the left • use zero as a place holder • use a place value chart to multiply decimals by 1000
		4	Multiplying decimals by 10, 100, 1000	• multiply decimals by 10, 100, 1000
	Dividing decimals by powers of 10	1	Dividing decimals by powers of 10	• use a place value chart to divide decimals by 100 • recognize that the digits move one place the right • use zero as a place holder
		2	Dividing decimals by powers of 100	• use a place value chart to divide decimals by 100 • recognize that the digits move two places the right • use zero as a place holder
		3	Dividing decimals by powers of 1000	• use a place value chart to divide decimals by 100 • recognize that the digits move three places to the right • use zero as a place holder
Addition and Subtraction **B2.4 add and subtract integers, using appropriate strategies, in various contexts**				
Add and subtract integers	Add and subtract integers	1	Adding integers	• add integers
		2	Subtracting integers	• subtract integers
		3	Adding and subtracting negative integers	• add and subtract negative integers • understand the way negative integers subtract from something actually adds positively • understand that 9–(–4) = 13 because –4 is 13 away from +9
		4	Solving problems in contexts involving addition and subtraction with integers	• solve problems in contexts involving addition and subtraction with integers

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Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Addition and Subtraction B2.5 add and subtract fractions, using appropriate strategies, in various contexts				
Add/subtract fractions & mixed numbers	Adding proper fractions	1	Adding proper fractions with common denominators	• add proper fractions with common denominators
		2	Adding proper fractions with unlike denominators	• add proper fractions with unlike denominators • explain why there must be a common denominator in order to add fractions
	Adding improper fractions	1	Adding improper fractions with common denominators	• add improper fractions with common denominators • add improper fractions with common denominators expressing answers as a mixed number
		2	Adding improper fractions with unlike denominators	• add improper fractions with unlike denominators • add improper fractions with unlike denominators expressing answers as a mixed number
	Adding mixed numbers	1	Adding mixed numbers with unlike denominators	• add mixed numbers with unlike denominators
	Subtracting proper fractions	1	Subtracting proper fractions with common denominators	• subtract proper fractions with common denominators
		2	Subtracting proper fractions with unlike denominators	• subtract proper fractions with unlike denominators • explain why there must be a common denominator in order to subtract fractions
Add and subtract integers	Subtracting mixed numbers	1	Subtracting mixed numbers with common denominators	• subtract mixed numbers with common denominators
		2	Subtracting mixed numbers with unlike denominators	• subtract mixed numbers with unlike denominators
	Subtracting improper fractions	1	Subtracting improper fractions with common denominators	• subtract improper fractions with common denominators • subtract improper fractions with common denominators, expressing answers as a mixed number
		2	Subtracting improper fractions with unlike denominators	• subtract improper fractions with unlike denominators • subtract improper fractions with unlike denominators expressing answers as a mixed number

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Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.6 multiply and divide fractions by fractions, as well as by whole numbers and mixed numbers, in various contexts				
Multiply/divide fractions	Multiply proper fractions	1	Multiplying proper fractions	• determine the effect of multiplying by a number with magnitude less than 1 • multiply proper fractions using written methods • demonstrate multiplication of a fraction by another fraction using a diagram to illustrate the process • solve problems involving multiplying fractions in context • calculate fractions of quantities using mental or written strategies • choose the appropriate equivalent form for mental computation
	Multiply fractions/ mixed numbers by whole numbers	1	Multiplying a unit fraction by a whole number greater than 1	• multiply a unit fraction by a whole number greater than 1
		2	Multiplying proper fractions by a whole number greater than 1	• multiply proper fractions by a whole number greater than 1
		3	Multiplying improper fractions by a whole number greater than 1	• multiply improper fractions by a whole number greater than 1
		4	Multiplying improper fractions by a whole number greater than 1, expressing answer as a mixed number	• multiply improper fractions, expressing answer as a mixed number
		5	Multiplying mixed numbers by a whole number greater than 1	• multiply mixed numbers by a whole number greater than 1
	Multiply improper fractions	1	Multiplying 2 improper fractions	• multiply improper fractions using written methods
		2	Multiplying 2 improper fractions, expressing the answer as a mixed number	• multiply 2 improper fractions expressing the answer as a mixed number
	Multiply mixed numbers	1	Multiplying 2 mixed numbers	• multiply mixed numbers using written methods
	Multiply proper/ improper fractions & mixed numbers	1	Multiplying proper fractions, improper fractions, and mixed numbers using written methods	• multiply proper fractions, improper fractions, and mixed numbers using written methods

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division **B2.6 multiply and divide fractions by fractions, as well as by whole numbers and mixed numbers, in various contexts**				
Multiply/divide fractions	Divide a whole number by a fraction/mixed number	1	Dividing positive integers by unit fractions	• divide positive integers by unit fractions
		2	Dividing a positive integer by a proper fraction	• divide a positive integer by a proper fraction
		3	Dividing a positive integer by an improper fraction	• divide a positive integer by an improper fraction and mixed number
		4	Dividing a positive integer by a mixed fraction/ number	• divide a positive integer by a mixed fraction/number
	Divide a fraction/mixed number by a whole number	1	Dividing a unit fraction by a positive integer	• divide unit fractions by whole numbers, eg 1/3 ÷ 2 = 1/6
		2	Dividing a proper fraction by a positive integer	• divide a non-unit proper fraction by a whole number (where the divisor is a factor of the numerator). Use diagrams for support • divide a non-unit proper fraction by any whole number
		3	Dividing an improper fraction by a positive integer	• divide an improper fraction by a positive integer
		4	Dividing a mixed number by a positive integer	• divide a mixed number by a positive integer
	Divide proper fractions	1	Dividing a proper fraction by a proper fraction	• divide a proper fraction by a proper fraction
	Divide proper fractions and improper fractions	1	Dividing improper fractions by proper fractions and vice versa	• divide improper fractions by proper fractions and vice versa
	Divide mixed numbers and proper fractions	1	Dividing mixed numbers by proper fractions and vice versa	• divide mixed numbers by proper fractions and vice versa
	Divide mixed numbers	1	Dividing a mixed number by a mixed fraction/ number	• divide a mixed number by a mixed number
	Divide improper fractions	1	Dividing an improper fraction by an improper fraction	• divide an improper fraction by an improper fraction
	Divide improper fractions and mixed numbers	1	Dividing an improper fraction by a mixed number and vice versa	• divide an improper fraction by a mixed number and vice versa

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

B. Number

B2. Operations - use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

Quest	Learning Journey	Steps	Content	Detail
Multiplication and Division B2.7 multiply and divide integers, using appropriate strategies, in various contexts				
Multiply and divide integers	Multiplying integers	1	Multiplying integers	• multiply integers
	Dividing integers	1	Understanding that integers can be divided, provided that the divisor is not 0	• understand that integers can be divided, provided that the divisor is not 0
Multiplication and Division B2.8 compare proportional situations and determine unknown values in proportional situations, and apply proportional reasoning to solve problems in various contexts				
Compare/ apply proportional reasoning	Comparing rates	1	Comparing rates	• compare 2 quantities of different rates
		2	Solving problems comparing 2 given rates by simplifying	• solve problems comparing 2 given rates by simplifying
	Identifying the constant of proportionality	1	Identifying the constant of proportionality from a table of values	• identify the constant of proportionality from a table of values • find the missing values from a table using the constant of proportionality
		2	Identifying the constant of proportionality (unit rate) in tables, graphs, equations, diagrams and verbal descriptions of proportional relationships	• identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams and verbal descriptions of proportional relationships
	Ratio/percent problems, proportional relationships	1	Solving multi-step ratio and percent problems using proportional relationships	• solve multi-step ratio and percent problems using proportional relationships
	Graphs of proportional relationships	1	Graphing proportional relationships	• graph proportional relationships • interpret the unit rate as the slope of the graph
		2	Understanding what a point (x, y) on the graph of a proportional relationship means in terms of the situation	• understand what a point (x, y) on the graph of a proportional relationship means in terms of the situation
	Comparing proportional relationships	1	Comparing 2 different proportional relationships represented in different ways	• compare 2 different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of 2 moving objects has greater speed

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.1 identify and compare a variety of repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and compare linear growing and shrinking patterns on the basis of their constant rates and initial values**				
Identify and compare patterns	Comparing linear relationships, Cartesian plane	1	Comparing linear relationships on the Cartesian plane without the use of digital technology	• graph more than 1 line on the same set of axes and compare the graphs to determine similarities and differences • identify similarities and differences between groups of linear relationships
Patterns **C1.2 create and translate repeating, growing, and shrinking patterns involving rational numbers using various representations, including algebraic expressions and equations for linear growing and shrinking patterns**				
Creating patterns, rational numbers	Modelling real-life relationships	1	Modelling real-life relationships	• model real-life relationships involving constant rates where the initial condition starts at 0 (e.g., speed, heart rate, billing rate) through investigation using tables of values and graphs • model real-life relationships involving constant rates (e.g., speed, heart rate, billing rate) using algebraic equations with variables to represent the changing quantities in the relationship • analyze real-life relationships involving constant rates
	Continuing/ creating sequences, rational numbers	1	Continuing and creating sequences involving whole numbers, fractions and decimals	• describe the rule used to create the sequence • continue and create number patterns, with and without the use of digital technologies, using whole numbers, fractions and decimals, eg 1/4, 1/8, 1/16, ... or 1.25, 2.5, 5 ... • describe how number patterns have been created and how they can be continued • create simple shape patterns using concrete materials • find missing terms in a number sequence
	Creating a linear sequence given the nth term rule	1	Generating a linear sequence given the nth term rule	• Generate the first few terms of a linear sequence given the nth term rule • use the nth term rule to find missing terms of the sequence (eg 100th term) • use the nth term rule to determine whether a number exists in a sequence

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns **C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in growing and shrinking patterns involving rational numbers, and use algebraic representations of the pattern rules to solve for unknown values in linear growing and shrinking patterns**				
Pattern rules, rational numbers	Find the nth term, rational coefficients	1	Finding the nth term of linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with integer coefficients of n	• find the nth term of increasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with integer coefficients of n • find the nth term of decreasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with integer coefficients of n
		2	Finding the nth term of linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with decimal coefficients of n	• find the nth term of increasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with decimal coefficients of n • find the nth term of decreasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with decimal coefficients of n
		3	Finding the nth term of linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with fractional coefficients of n	• find the nth term of increasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with fractional coefficients of n • find the nth term of a decreasing linear sequences arising from a given set of numbers or sequences generated from concrete/visual representations with fractional coefficients of n
	Use the nth term rule for a linear pattern	1	Using the nth term rule for a linear series	• use the nth term rule to find missing terms of the sequence, eg 100th term • use the nth term rule to determine whether a number exists in a sequence
		2	Solving problems involving the use of the nth term formula for a linear sequence	• solve problems involving the use of the nth term formula for a linear sequence
	Investigate linear relationships, Cartesian plane	1	Investigating linear relationships on the coordinate plane for number and geometric patterns	• investigate linear relationships on the coordinate plane by completing a table of values, plotting the results and from there determine whether the relationship is linear or not (with and without digital technology) • identify a table of values matching a linear relationship plotted on the coordinate plane (with and without digital technology) • identify the table of values for a given number pattern that matches the points plotted on a coordinate plane • describe the linear relationship and the rules (term-to-term and also position-to-term) • determine the nth term rule where a linear relationship exists

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

C. Algebra

C1. Patterns and Relationships - identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

Quest	Learning Journey	Steps	Content	Detail
Patterns C1.4 create and describe patterns to illustrate relationships among rational numbers				
Create/ describe patterns	Describe patterns, algebraic expressions/ equations	1	Determining whether a particular pattern can be described using algebraic symbols	• determine whether a particular pattern can be described using algebraic symbols • describe patterns using algebraic symbols
		2	Replacing written statements describing patterns with equations written in algebraic symbols	• replace written statements describing patterns with equations written in algebraic symbols

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equations, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Variables and Expressions C2.1 add and subtract monomials with a degree of 1, and add binomials with a degree of 1 that involve integers, using tools				
Add/subtract monomials/ binomials	Add/subtract monomials/ binomials	1	Simplifying algebraic expressions that involve addition and subtraction	• extend and apply the laws and properties of arithmetic to algebraic terms and expressions • recognize like terms and add and subtract them to simplify algebraic expressions • verify whether a simplified expression is correct by substituting numbers for variables • connect algebra with the commutative and associative properties of arithmetic to determine that $a + b = b + a$ and $(a + b) + c = a + (b + c)$ • recognize the role of grouping symbols and the different meanings of expressions, such as $2a + 1$ and $2(a + 1)$
Variables and Expressions C2.2 evaluate algebraic expressions that involve rational numbers				
Evaluating algebraic expressions	Evaluating algebraic expressions	1	Evaluating algebraic expressions using natural numbers	• evaluate algebraic expressions using natural numbers
		2	Substituting into algebraic expressions and evaluating the result	• substitute into algebraic expressions and evaluate the result • substitute numerical values into formulas and expressions, including scientific formulas

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equations, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Equalities and Inequalities C2.3 solve equations that involve multiple terms, integers, and decimal numbers in various contexts, and verify solutions				
Solve equations: integers, decimals	Solve 1-step equations, add/ subtract	1	Solving linear equations using inverse operations involving 1 step of addition or subtraction (integers) with integer solutions	• solve linear equations using inverse operations involving 1 step of addition or subtraction (integers) with integer solutions • solve concretely, pictorially and symbolically problems that can be represented by 1-step linear equations of the form x + a = b, where a and b are integers
		2	Solving linear equations using inverse operations involving 1 step of addition or subtraction (integers or decimals) with integer and non-integer solutions	• solve linear equations using inverse operations involving 1 step of addition or subtraction (integers or decimals) with integer and non-integer solutions
	Solve 1-step equations, multiply/divide	1	Solving linear equations using inverse operations involving 1 step of multiplication with integer solutions	• solve linear equations using inverse operations involving 1 step of multiplication with integer solutions • solve concretely, pictorially and symbolically problems that can be represented by 1-step linear equations of the form ax = b, where a and b are integers
		2	Solving linear equations using inverse operations involving 1 step of multiplication (integers or decimals) with integer and non-integer solutions	• solve linear equations using inverse operations involving 1 step of multiplication (integers or decimals) with integer and non-integer solutions
		3	Solving linear equations using inverse operations involving 1 step of division (integers) with integer solutions	• solve linear equations using inverse operations involving 1 step of division (integers) with integer solutions • solve concretely, pictorially and symbolically problems that can be represented by 1-step linear equations of the form x/a = b, a>0, where a and b are integers
		4	Solving linear equations using inverse operations involving 1 step of division with integer and non-integer solutions (variable in numerator position)	• solve linear equations using inverse operations involving 1 step of division with integer and non-integer solutions (variable in numerator position)
	Solve 1-step equations, mixed operations	1	Solving linear equations using inverse operations involving 1 step with mixed operations with integer solutions	• solve linear equations using inverse operations involving 1 step with mixed operations with integer solutions

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equations, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Equalities and Inequalities C2.3 solve equations that involve multiple terms, integers, and decimal numbers in various contexts, and verify solutions				
Solve equations: integers, decimals	Solve 2-step equations, mixed operations	1	Solving linear equations using inverse operations involving 2 steps with mixed operations with integer solutions (variable always in numerator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with integer solutions (variable always in numerator position) • solve concretely, pictorially, and symbolically problems that can be represented by 2-step linear equations of the form ax + b = c, where a and b and c are integers • solve concretely, pictorially, and symbolically problems that can be represented by 2-step linear equations of the form x/a + b = c, a > 0, where a and b and c are integers
		2	Solving linear equations using inverse operations involving 2 steps with mixed operations with integer solutions (variable in numerator or denominator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with integer solutions (variable in numerator or denominator position)
		3	Solving linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (variable always in numerator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (variable always in numerator position)
		4	Solving linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (variable in numerator or denominator position)	• solve linear equations using inverse operations involving 2 steps with mixed operations with integer and non-integer solutions (variable in numerator or denominator position)
	Solve 3-step equations, mixed operations	1	Solving linear equations (integer coefficients) using inverse operations involving 3 steps with mixed operations with integer solutions	• solve linear equations (integer coefficients) using inverse operations involving 3 steps with mixed operations with integer solutions
		2	Solving linear equations (integer coefficients) using inverse operations involving 3 steps with mixed operations with integer and non-integer solutions	• solve linear equations (integer coefficients) using inverse operations involving 3 steps with mixed operations with integer and non-integer solutions

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

C. Algebra

C2. Equations and Inequalities - demonstrate an understanding of variables, expressions, equations, and inequalities, and apply this understanding in various contexts

Quest	Learning Journey	Steps	Content	Detail
Equalities and Inequalities C2.3 solve equations that involve multiple terms, integers, and decimal numbers in various contexts, and verify solutions				
Solve equations: integers, decimals	Solve linear equations with variable on both sides	1	Solving linear equations (integer coefficients) using inverse operations involving variables on both sides of the equation	• solve linear equations (integer coefficients) using inverse operations involving variables on both sides of the equation
	Solve linear equations, expanding brackets	1	Solving linear equations (integer coefficients) using inverse operations involving expanding parentheses	• solve linear equations (integer coefficients) using inverse operations involving expanding parentheses • solve concretely, pictorially, and symbolically equations involving expanding parentheses of the form a(x + b) = c where a and b and c are integers
	Checking solutions to equations by substituting	1	Checking solutions to equations by substituting	• check solutions to equations by substituting
Equalities and Inequalities C2.4 solve inequalities that involve integers, and verify and graph the solutions				
Solving inequalities involving integers	Solving 1-step inequalities	1	Solving inequalities using inverse operations involving 1 step with integer solutions	• solve inequalities using inverse operations involving 1 step with integer solutions
	Solving 2-step inequalities	1	Solving inequalities using inverse operations involving 2 steps with integer solutions	• solve inequalities using inverse operations involving 2 steps with integer solutions
	Solving inequalities with variables on both sides	1	Solving inequalities with variables either side of the equals sign	• solve inequalities with variables either side of the equals sign
	Graphing solutions of inequalities, number line	1	Graphing the solution set of an inequality on a number line	• represent an inequality on a number line using open or closed circles using an arrow to mark the direction in which the values hold true

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Collection and Organization **D1.1 identify situations involving one-variable data and situations involving two-variable data, and explain when each type of data is needed**				
Identify univariate and bivariate data	Identifying univariate and bivariate data	1	Distinguishing bivariate data from single variable (univariate) data	• distinguish bivariate data from single variable (univariate) data
Data Visualization **D1.3 select from among a variety of graphs, including scatter plots, 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**				
Selecting graphs and displaying data	Displaying data in dot plots	1	Constructing dot plots	• construct dot plots • explain the importance of aligning data points when constructing dot plots
	Displaying data in histograms	1	Constructing histograms for discrete data sets where grouping is required	• construct histograms for discrete data sets where grouping is required
Data Analysis **D1.5 use mathematical language, including the terms "strong", "weak", "none", "positive", and "negative", to describe the relationship between two variables for various data sets with and without outliers**				
Relationships in bivariate data	Use and interpret scatter plots of bivariate data	1	Using and interpreting scatter plots of bivariate data	• recognize correlation on scatter plots • recognize level of correlation • draw estimated lines of best fit • make predictions • interpolate and extrapolate apparent trends whilst knowing the dangers of so doing • describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

D. Data

D1. Data Literacy - manage, analyze, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Quest	Learning Journey	Steps	Content	Detail
Data Analysis **D1.6 analyze different sets of data presented in various ways, including in scatter plots 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**				
Analyzing and interpreting graphs	Interpreting information from secondary sources	1	Collecting and interpreting information from secondary sources, presented as tables and/or graphs, about a matter of interest	• collect and interpret information from secondary sources, presented as tables and/or graphs, about a matter of interest, e.g., sporting data, information about the relationship between wealth or education, and the health of populations of different countries • interpret and use scales on graphs, including those where abbreviated measurements are used, e.g., '50' on a vertical axis representing thousands is interpreted as '50 000' • analyze a variety of data displays used in the print or digital media and in other school subject areas, e.g., share movement graphs, data displays showing sustainable food production • identify features on graphical displays that may mislead and result in incorrect interpretation, e.g., displaced zeros, the absence of labelling on 1 or both axes, potentially misleading units of measurement
	Interpreting data in various graphs	1	Interpreting dot plots	• interpret dot plots
		2	Interpreting divided/horizontal bar graphs	• interpret divided/horizontal bar graphs
		3	Interpreting pie/circle graphs	• interpret pie/circle graphs
		4	Interpreting line graphs	• interpret line graphs
	Analyzing misleading graphs	1	Analyzing graphical displays to recognize features that may have been manipulated to cause a misleading interpretation and/or support a particular point of view	• analyze graphical displays to recognize features that may have been manipulated to cause a misleading interpretation and/or support a particular point of view • explain and evaluate the effect of misleading features on graphical displays • identify terms that can be used to describe misleading features on a data display

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

Mathletics

D. Data

D2. Probability - describe the likelihood that events will happen, and use that information to make predictions

Quest	Learning Journey	Steps	Content	Detail
Probability D2.1 solve various problems that involve probability, using appropriate tools and strategies, including Venn and tree diagrams				
Probability with Venn and tree diagrams	Theoretical probability using tree diagrams	1	Determining the theoretical probability of a series of events using tree diagrams	• determine the theoretical probability of a series of a events using a tree diagram (diagram given) • determine the theoretical probability of a series of a events using a tree diagram (diagram not given, needs to be constructed)
	Identifying and representing the sample space	1	Identifying the sample space for a probability experiment involving 1 event	• identify the sample space for a probability experiment involving 1 event
		2	Identifying the sample space for a probability experiment involving 2 independent events	• identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving 2 independent events
		3	Representing sample spaces for compound events using organized lists, tables, and tree diagrams	• represent sample spaces for compound events using organized lists, tables, and tree diagrams
	Probability: independent/ dependent combined events	1	Calculating the probability of independent and dependent combined events, including using tree diagrams and other representations, and knowing the underlying assumptions	• calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions • generate frequencies for compound events by using simulation
	Using data presented in Venn diagrams	1	Using data presented in Venn diagrams to answer problems, including probability questions	• use data presented in Venn diagrams to answer problems, including probability questions • use data presented in Venn diagrams to answer problems where missing values must first be found, including probability questions
Probability D2.2 determine and compare the theoretical and experimental probabilities of multiple independent events happening and of multiple dependent events happening				
Probability independent/ dependent events	Comparing experimental and theoretical probability	1	Comparing and discussing the results of a chance experiment (experimental probability results) with the theoretical probability	• compare and discuss the results of a chance experiment (experimental probability results) with the theoretical probability • compare the expected frequencies of outcomes of chance experiments with observed frequencies, including where the outcomes are not equally likely
	Finding the probability of independent events	1	Recognizing and using the fact that for independent events P(A and B) = P(A) × P(B)	• recognize and use the fact that for independent events P(A and B) = P(A) × P(B)

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Geometric Reasoning E1.1 identify geometric properties of tessellating shapes and identify the transformations that occur in the tessellations				
Tessellations	Recognizing tessellations	1	Recognizing tessellations	• recognize and describe transformations in tessellating designs consisting of a single shape • create and record tessellating designs using reflections on a single shape • determine whether a shape will or will not tessellate
Geometric Reasoning E1.3 use scale drawings to calculate actual lengths and areas, and reproduce scale drawings at different ratios				
Using scale drawings	Using scales on maps	1	Using simple scales on maps	• establish the need for scales on maps (with and without grid referencing) • use the scale on a map to determine the distance (as the crow flies) between 2 features
	Identifying scale drawings using the scale factor	1	Constructing scale drawings given an object and the scale factor	• construct scale drawings given an object and the scale factor
Location and Movement E1.4 describe and perform translations, reflections, rotations, and dilations on a Cartesian plane, and predict the results of these transformations				
Transformations, mapping rules	Plotting transformations on the Cartesian plane	1	Plotting the transformations of shapes on the Cartesian plane	• plot the position of the image of a given shape on the Cartesian plane resulting from a one-step translation, reflection in the x-axis or y-axis, or rotation about the origin by a multiple of 90° • plot the position of the image of a given shape on the Cartesian plane resulting from a combination of translations, reflections in the x-axis or y-axis, and rotations about the origin by a multiple of 90° • explore and describe different combinations of transformations that produce the same image of a given shape
	Dilations with mapping rules	1	describe the effects of dilation on two-dimensional shapes using coordinates	• describe the effects of dilation on two-dimensional shapes using coordinates • determine the figure's new position in the coordinate system given a particular dilation
	Translations with mapping rules	1	Exploring the effects of translations on two-dimensional shapes using coordinates	• describe the effects of translations on two-dimensional shapes using coordinates • determine the figure's new position in the coordinate system given a particular translation
	Rotations with mapping rules	1	Exploring the effects of rotations on two-dimensional shapes using coordinates	• describe the effects of rotations on two-dimensional shapes using coordinates • determine the figure's new position in the coordinate system given a particular rotation

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E1. 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

Quest	Learning Journey	Steps	Content	Detail
Location and Movement E1.4 describe and perform translations, reflections, rotations, and dilations on a Cartesian plane, and predict the results of these transformations				
Transformations, mapping rules	Reflections with mapping rules	1	Describing the effects of reflection on two-dimensional shapes using coordinates	• describe the effects of reflection on two-dimensional shapes using coordinates • determine the figure's new position in the coordinate system given a particular reflection
	Combinations of transformations with mapping rules	1	Exploring the effects following a combination of dilation, translation, rotation or reflection on two-dimensional shapes using coordinates	• describe the effects following a combination of dilation, translation, rotation or reflection on two-dimensional shapes using coordinates • determine the figure's new position in the coordinate system given a particular combination of dilation, translation, rotation or reflection

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Lines and Angles E2.2 solve problems involving angle properties, including the properties of intersecting and parallel lines and of polygons				
Solving problems using angle properties	Calculating the interior angles of polygons	1	Calculating interior angle sum of a triangle	• explore through measurement the sum of interior angles of a triangle • calculate an unknown angle represented by a variable within a triangle, given the other 2 angles
		2	Calculating angles in isosceles triangles	• explore, through measurement, the relationship between the base angles of an isosceles triangle • determine an unknown base angle represented by a variable within an isosceles triangle given another base angle • calculate the non-base angle represented by a variable within an isosceles triangle given 1 of the base angles, the relationship between the base angles and the angle sum of the triangle • calculate the base angle represented by a variable within an isosceles triangle given the non-base angle, the relationship between the base angles and the angle sum of the triangle
		3	Finding the interior angle sum of a quadrilateral	• explore the interior angle sum of a quadrilateral using concrete materials and digital technology
		4	Finding the interior angle sum of a polygon	• explore the interior angle sum of a polygon using concrete materials and digital technology

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Lines and Angles **E2.2 solve problems involving angle properties, including the properties of intersecting and parallel lines and of polygons**				
Solving problems using angle properties	Calculating supplementary and complementary angles	1	Calculating consecutive interior angles	• calculate the size of an unknown angle in a diagram and explain how this is done (using consecutive interior angles)
		2	Calculating complementary angles	• calculate the size of an unknown angle in a diagram and explain how this is done (using complementary angles)
	Angles on parallel lines cut by a transversal	1	Exploring special pairs of angles on parallel lines	• define, identify and draw transversals on sets of 2 or more parallel lines • explore, through measurement, the relationships between pairs of angles formed when a transversal is drawn on a pair of parallel lines • define and identify pairs of equal corresponding angles when 2 or more parallel lines are cut by a transversal • define and identify pairs of equal alternate angles when 2 or more parallel lines are cut by a transversal • define and identify pairs of supplementary cointerior angles when 2 or more parallel lines are cut by a transversal
		2	Applying geometric reasoning with angles on parallel lines by choosing the appropriate angle relationship	• apply geometric reasoning with angles on parallel lines by choosing the appropriate angle relationship • choose and apply the appropriate angle property to calculate unknown angles on parallel lines represented by variables
	Corresponding angles on parallel lines	1	Applying geometric reasoning with corresponding angles on parallel lines	• apply geometric reasoning with corresponding angles on parallel lines • use corresponding angles on parallel lines to calculate unknown angles represented by variables
	Alternate angles on parallel lines	1	Applying geometric reasoning with alternate angles on parallel lines	• apply geometric reasoning with alternate angles on parallel lines • use alternate angles on parallel lines to calculate unknown angles represented by variables
	Co-interior angles on parallel lines	1	Applying geometric reasoning with co-interior angles on parallel lines	• apply geometric reasoning with cointerior angles on parallel lines • use cointerior angles on parallel lines to calculate unknown angles represented by variables

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Length, Area, and Volume **E2.3 solve problems involving the perimeter, circumference, area, volume, and surface area of composite two-dimensional shapes and three-dimensional objects, using appropriate formulas**				
Composite shapes and objects	Calculating the area of composite shapes	1	Calculating the area of composite shapes constructed from triangles and special quadrilaterals	• apply area formulas for a variety of composite shapes to calculate their area
	Calculating the perimeter of composite shapes	1	Solving problems involving perimeters of composite polygons	• solve problems involving perimeters of composite polygons formed using only triangles, squares, rectangles or parallelograms • solve problems involving perimeters of composite polygons formed using regular polygons • solve problems involving perimeters of composite polygons formed using only triangles, squares, rectangles or parallelograms with dimensions given in different units • solve problems involving perimeters of composite polygons formed using regular polygons with dimensions given in different units
	Calculating the volume of composite shapes	1	Finding the volume of prism with a composite/irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in the same units	• find the volume of prism with a composite/irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in the same units
		2	Finding the volume of prism with a composite/irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in different units	• find the volume of prism with a composite/irregular polygon uniform cross-section, given their perpendicular heights and area of their cross-sections all in different units
		3	Finding the volume of prism with a composite/irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in the same units	• find the volume of prism with a composite/irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in the same units
		4	Finding the volume of prism with a composite/irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in different units	• find the volume of prism with a composite/irregular polygon with uniform cross-section, given their perpendicular heights and dimensions of the cross-sections all in different units
		5	Finding the volumes of composite solids involving prisms and cylinders, eg a cylinder on top of a rectangular prism	• find the volumes of composite solids involving prisms and cylinders, eg a cylinder on top of a rectangular prism • dissect composite solids into 2 or more simpler solids to find their volumes

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

Mathletics

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Length, Area, and Volume **E2.3 solve problems involving the perimeter, circumference, area, volume, and surface area of composite two-dimensional shapes and three-dimensional objects, using appropriate formulas**				
Composite shapes and objects	Calculating the surface area of composite shapes	1	Finding the surface area: composite solids involving prisms	• find the surface area of composite three-dimensional objects involving prisms • find the surface area of composite three-dimensional objects involving prisms within the context of a problem
		2	Finding the surface area: composite solids involving cylinders	• find the surface area of composite three-dimensional objects involving cylinders • find the surface area of composite three-dimensional objects involving cylinders within the context of a problem
Length, Area, and Volume **E2.4 describe the Pythagorean relationship using various geometric models, and apply the theorem to solve problems involving an unknown side length for a given right triangle**				
The Pythagorean Theorem	Identifying the hypotenuse, right triangles	1	Identifying the hypotenuse as the longest side in any right-angled triangle and also as the side opposite the right angle	• identify the hypotenuse as the longest side in any right-angled triangle and also as the side opposite the right angle • describe how to identify the hypotenuse in a right-angled triangle using either the fact that it is the longest side or the side opposite the right angle
	Identifying right triangles, Pythagorean Theorem	1	Explaining a proof of the Pythagorean Theorem and its converse	• explain a proof of the Pythagorean Theorem and its converse
	Pythagorean triples	1	Identifying a Pythagorean triple as a set of 3 numbers that satisfy the Pythagorean Theorem	• identify a Pythagorean triple as a set of 3 numbers that satisfy the Pythagorean Theorem • establish new Pythagorean triples by starting with another • identify that when each term of a Pythagorean triple is multiplied/divided by a constant, the resulted 3 figures also form a Pythagorean triple
	Pythagorean Theorem: missing short side	1	Finding the length of an unknown side (shorter sides only) using the Pythagorean Theorem	• find the length of an unknown side (shorter sides only) using the Pythagorean Theorem
		2	Finding the length of an unknown side (shorter sides only) using the Pythagorean Theorem, rounding answers	• find the length of an unknown side (shorter sides only) using the Pythagorean Theorem, rounding answers

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

E. Spatial Sense

E2. Measurement - compare, estimate, and determine measurements in various contexts

Quest	Learning Journey	Steps	Content	Detail
Length, Area, and Volume E2.4 describe the Pythagorean relationship using various geometric models, and apply the theorem to solve problems involving an unknown side length for a given right triangle				
The Pythagorean Theorem	Pythagorean Theorem: missing hypotenuse	1	Finding the length of an unknown side (hypotenuse only) using the Pythagorean Theorem	• find the length of an unknown side (hypotenuse only) using the Pythagorean Theorem
		2	Finding the length of an unknown side (hypotenuse only) using the Pythagorean Theorem, rounding answers	• find the length of an unknown side (hypotenuse only) using the Pythagorean Theorem, rounding answers
	Pythagorean Theorem: missing side	1	Finding the length of an unknown side (shorter side and hypotenuse) using the Pythagorean Theorem	• find the length of an unknown side (shorter side and hypotenuse) using the Pythagorean Theorem
		2	Finding the length of an unknown side (shorter side and hypotenuse) using the Pythagorean Theorem, rounding answers	• find the length of an unknown side (shorter side and hypotenuse) using the Pythagorean Theorem, rounding answers

Ontario Curriculum Grades 8

Understanding Practice and Fluency (UPF)

F. Financial Literacy

F1. Money and Finances - demonstrate the knowledge and skills needed to make informed financial decisions

Quest	Learning Journey	Steps	Content	Detail
Financial Management F1.4 determine the growth of simple and compound interest at various rates using digital tools, and explain the impact interest has on long-term financial planning				
Simple and compound interest	Solving problems involving simple interest	1	Calculating simple interest using the formula	• calculate simple interest using the formula
		2	Solving problems involving simple interest	• solve problems involving simple interest

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