

Mathletics

Alberta Program of Studies

Skill Quests

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Grade 4

Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating

Outcome	Quests	Content
Students apply place value to decimal numbers	Decimals to hundredths	Introducing decimal notation
		Decimal tenths
		Decimal hundredths
		Rounding decimals
		Comparing decimals
		Partitioning decimals
Students add and subtract within 10 000, including decimal numbers to hundredths	Addition to 10 000	Adding up to 1000 bar models
		Adding up to 10 000 jump strategy
		Adding up to 10 000 split strategy
		Adding up to 10 000 round & compensate
		Adding up to 10 000 mental strategies
		Adding up to 10 000 using algorithm
	Subtraction to 10 000	Subtracting up to 1000 bar models
		Subtracting up to 10 000 jump strategy
		Subtracting up to 10 000 split strategy
		Subtracting up to 10 000 place value partitioning
		Subtracting up to 10 000 rounding & compensating
		Subtracting up to 10 000 mental strategies
		Subtracting up to 10 000 algorithms
	Solve add sub word problems	Solving addition & subtraction word problems
	Check accuracy with estimation	Estimating addition & subtraction
	Add & subtract decimals to hundredths	Adding decimals to tenths
		Subtracting decimals
	Use decimals in the context of money	Using decimals in money
		Estimating & calculating change

		Solving money word problems
Students explain properties of prime and composite numbers using multiplication and division.	Prime & composite numbers	Introducing prime & composite numbers
	Find factors & multiples	Finding multiples up to 100, including LCM
	Find LCM of 2 whole numbers	Finding LCM of 2 whole numbers
		Finding factors & GCF to 100
	Situational questions, factors & multiples	
Students multiply and divide natural numbers within 10 000.	Multiplication & division facts for 6	Multiplying by 6
		Dividing by 6
		Multiplying & dividing by 6
	Multiplication & division facts for 7	Multiplying by 7
		Dividing by 7
		Multiplying & dividing by 7
	Multiplication & division facts for 8	Multiplying by 8
		Dividing by 8
		Multiplying & dividing by 8
	Multiplication & division facts for 9	Multiplying by 9
		Dividing by 9
		Multiplying & dividing by 9
	Multiplication & division facts for 11	Multiplying by 11
		Dividing by 11
		Multiplying & dividing by 11
	Multiplication & division facts for 12	Multiplying by 12
		Dividing by 12
		Multiplying & dividing by 12
	Multiplication & division patterns	Multiplying & dividing with multiples of 10 or 100
	Multiplication, 2- or 3-digit by 1-digit	Multiplying 2- or 3-digits by 1-digit, place value
		Multiplying 2- or 3-digits by 1-digit, doubling
		Multiplying 2- or 3-digits by 1-digit, area model
		Multiplying 2- or 3-digits by 1-digit, factoring
		Multiplying 2- or 3-digits by 1-digit, algorithm
		Multiply to 3-digits x 1-digit, expanded algorithm
		Multiply to 3-digits x 1-digit, round to estimate
		Multiplying by multiples of 10 & 100
	Multiplication strategies	Selecting multiplying strategies

	Division, 2-digit by 1-digit	Dividing 2-digits by 1-digit, models
		Dividing 2-digits by 1-digit, halving
		Dividing 2-digits by 1-digit, related facts
		Dividing 2-digits by 1-digit, inverse relationship
		Dividing 2-digit by 1-digit, extended algorithm
		Dividing 2-digit by 1-digit, algorithm
		Dividing 2-digit by 1-digit, round to estimate
		Dividing by 1 using bar models
	Division strategies	Selecting dividing strategies
	Multiplication & division word problems	Solving multiplication & division word problems
Students apply equivalence to the interpretation of fractions.	Equivalent fractions	Using models to find equivalent fractions
		Using mult div to find equivalent fractions
		Using a number line to find equivalent fractions
	Compare & order fractions	Comparing unit fractions
		Comparing & ordering proper fractions
Relate decimals & fractions	Relating decimals & fractions up to thousandths	
Simplify proper fractions	Using common factors to simplify fractions	
Students interpret percentages.	Whole-number percentages	Introducing percentages
	Express percentage representations	Fractions as percentages
		Decimals as percentages
		Comparing & ordering percentages
	Representing fractions & decimals	

Algebra: Equations express relationships between quantities.

Outcome	Quests	Content
Students represent and apply equality in multiple ways.	Introduce order of operations	Order of operations (addition & subtraction)
		Order of operations (multiplication & division)
		Order of operations (grouping symbols)
		Order of operations (all operations & symbols)
	Equations	Determining missing numbers in equations
		Solving multi-step equations
		Balancing number sentences
		Expressing word problems to one-step equations

Geometry: Shapes are defined and related by geometric attributes.

Outcome	Quests	Content	
Students analyze and explain geometric properties.	Features of 2-D shapes & 3-D objects	Identifying features on 3-D objects	
	Compare, describe & name 3-D shapes	Comparing, describing & naming 3-D shapes	
	Identify & sort quadrilaterals		Sorting & naming quadrilaterals
			Classifying quadrilaterals
	Classify triangles		Classifying triangles by their sides & angles
	Classify & sort plane shapes		Classifying plane shapes by spatial features
			Sorting plane shapes by spatial features
			Sorting polygons

Measurement: Attributes such as length, area, volume, and angle are quantified by measurement.

Outcome	Quests	Content
Students interpret and express area.	Measure the area	Estimating & comparing area non-rectilinear shapes
		Calculating area of composite shapes
		Estimating & measuring areas of rectangles
		Comparing & ordering rectangular areas
		Finding the area of a rectangle, arrays
		Finding the area of a rectangle, area model
		Finding the area of rectangles, formula
Students determine and express angles using standard units.	Measure & classify angles	Measuring & estimating angles
		Classifying angles
		Measuring angles with a circular protractor

Patterns: Awareness of patterns supports problem solving in various situations

Outcome	Quests	Content
Students interpret and explain arithmetic and geometric sequences.	Represent, analyze & apply patterns	Additive & subtractive number patterns
		Generating add/subtract patterns from a given rule
		Working with repeating number & shape patterns
		Multiplication & division number patterns
		Modelling number patterns from a table of values
		Working with shape patterns & rules
		Manipulate sets of numbers using a rule
		Describing pattern rules

Time: Duration is described and quantified by time.

Outcome	Quests	Content
Students communicate duration with standard units of time.	Duration of events	Introducing timelines
		Using timetables
		Calculating elapsed time
		Converting units of time

Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.

Outcome	Quests	Content
Students evaluate the use of scale in graphical representations of data.	Data collection	Collecting & sorting data
	Graphs using many-to-one correspondence	Using bar graph with many-to-one correspondence
		Using line graph with many-to-one correspondence
		Column graphs with many-to-one correspondence
		Picture graphs with many-to-one correspondence
		Using strip graphs
		Using stem-and-leaf plots
	Evaluate & compare data	Evaluating & comparing data
		Comparing pictographs - different correspondence

Grade 5

Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating

Outcome	Quests	Content
Students analyze patterns in place value.	Decimals to thousandths	Understanding decimals to thousandths
		Connecting tenths & hundredths
	Compare & order decimals to thousandths	Comparing & ordering decimals to thousandths
	Dividing by multiples of 10	Dividing whole numbers by multiples of 10
		Partitioning decimals to thousandths
	Number concepts to 1 000 000	Understanding the role of place value
		Reading & writing numbers up to 6 digits
		Comparing & ordering numbers up to 6 digits
		Identifying place value of 6-digit numbers
		Using place value to partition 6-digit numbers
	Number concepts to 10 000 000	Counting up to 10 000 000
		Reading & writing numbers to 8 digits
		Identifying place value 8-digit numbers
		Using place value to partition 7-digit numbers
		Comparing & ordering numbers up to 7 digits
		Rounding numbers up to 7 digits
	Strategies for estimation	Rounding 4- & 5-digit numbers
Rounding numbers up to 6-digits		
Rounding decimals		

Students add and subtract within 1 000 000, including decimal numbers to thousandths, using standard algorithms.	Strategies for computation	Using compensation to add & subtract
		Round numbers to estimate - multiply & divide
		Checking calculations when multiplying & dividing
		Adding using place value partitioning to 1 000 000
	Formal algorithm for addition	Formal algorithm for addition (no regrouping)
		Formal algorithm for addition (with regrouping)
		Formal algorithm with 3 or more addends
	Subtraction up to 1 000 000	Subtracting using compensation up to 1 000 000
		Subtracting using partitioning up to 1 000 000
	Formal algorithm for subtraction	Formal algorithm for subtraction (no decomposing)
		Formal algorithm for subtraction (decomposition)
	Strategies for addition & subtraction	Adding & subtracting using a bar model
		Applying strategies for addition & subtraction
		Using add/sub facts to calculate mentally
	Add & subtract decimals to thousandths	Adding decimals to thousandths
		Subtracting decimals to thousandths
Adding & subtracting decimal word problems		
Solving decimal word problems, 4 operations		
Round to estimate sums & differences	Rounding to estimate to the nearest 100 or 1000	
	Estimating sums & differences to thousandths	
	Checking calculations when adding & subtracting	
	Estimating decimal sums & differences	
Students determine divisibility of natural numbers.	Divisibility rules	Introducing divisibility rules for dividing by 2
		Introducing divisibility rules for dividing by 3
		Introducing divisibility rules for dividing by 4

		Introducing divisibility rules for dividing by 5
		Introducing divisibility rules for dividing by 6
		Introducing divisibility rules for dividing by 8
		Introducing divisibility rules for dividing by 9
		Introducing divisibility rules for dividing by 10
		Divisibility rules: dividing by 2, 3, 4, 5, 6, 10
Students multiply and divide natural numbers within 100 000, including with standard algorithms	Divide up to 3-digits by 1-digit	Dividing up to 3-digit by 1-digit, no remainders
		Dividing up to 3-digit by 1-digit, with remainders
		Dividing by partitioning, no remainders
		Dividing 3-digits by 1-digit, factoring
		Finding the remainder, 2-digits by 1-digit
		Dividing by partitioning with remainders
		Dividing 3-digits by 1-digit, formal algorithm
	Multiply & divide by multiples of 1000	Multiplying 1-digit numbers with multiples of 1000
		Dividing 1-digit numbers with multiples of 1000
	Multiply 4-digit by 1-digit	Multiply 4-digits by 1-digit using split method
		Multiply 4-digits by 1-digit using area model
		Multiply 4-digits by 1 using expanded algorithm
		Multiply 4-digits by 1-digit contracted algorithm
	Multiply & divide 2-digits by 2-digits	Multiplying 2-digits by 2-digits, area model
		Multiplying 2-digits by 2-digits, factorizing
		Multiplying 2-digits by 2-digits, use known facts
		Multiply or divide with multiples of 10 or 100
		Multiplying 2-digits by 2-digits, formal algorithm
		Multiplying 3-digits by 2-digits

	Multiply 3-digits by 2-digits	Multiplying 3-digits by 3-digits using area model	
	Multiply using rounding & compensating	Multiplying using rounding & compensating	
	Multiplication & division word problems	Solving multiplication word problems	
		Solving division word problems	
Students interpret improper fractions.	Classify fractions	Identifying fractions	
	Improper fractions & mixed numbers	Comparing & ordering mixed numbers	
		Comparing & ordering improper fractions	
		Comparing & ordering fractions & mixed numbers	
		Converting improper fractions to mixed numbers	
		Converting mixed numbers to improper fractions	
Students add and subtract fractions with common denominators.	Add fractions & mixed numbers	Adding fractions, like denominator	
		Adding a whole number & a fraction	
		Adding improper fractions, like denominator	
		Adding mixed numbers, like denominator	
	Subtract fractions & mixed numbers	Subtracting fractions, like denominator	
		Subtracting a fraction from a whole number	
		Subtracting improper fractions, like denominator	
		Subtracting with mixed numbers, like denominator	
	Add & subtract fractions	Adding & subtracting fractions, like denominator	
	Fractions & mixed numeral problems	Solving proper fractions & mixed numeral problems	
	Students employ ratios to represent relationships between quantities.	Introduction to ratios	Introducing ratios

Algebra: Equations express relationships between quantities

Outcome	Quests	Content
Students interpret numerical and algebraic expressions.	Introduction to algebraic expressions	Introducing algebraic expressions
	Evaluate an expression	Evaluating expressions using substitution
	Linear equations, integers	Solving linear equations with integers
	Equations with letter variables	Expressing word problems as equations
	One-step equations with variables	Writing one-step equations using variables
		Solving one-step equations & word problems
		Solving one-step equations using bar model
	Write multi-step numerical expressions	Writing multi-step numerical expressions

Geometry: Shapes are defined and related by geometric attributes.

Outcome	Quests	Content
Students investigate symmetry as a geometric property.	Recognize & draw line symmetry	Recognizing line symmetry Identifying & drawing lines of symmetry
	Recognise rotational symmetry	Recognising rotational symmetry
	Order rotational symmetry	Ordering rotational symmetry

Coordinate Geometry: Location and movement of objects in space can be communicated using a coordinate grid.

Outcome	Quests	Content
Students relate location to position on a grid.	Introduction to grid references	Introducing grid references
	The coordinate grid, first quadrant	Plotting points in the first quadrant
		Plotting points that create a shape

Measurement: Attributes such as length, area, volume, and angle are quantified by measurement

Outcome	Quests	Content
Students estimate and calculate area using standard units	Introduction of formal units for area	Introducing the square centimetre & square metre
	Perimeters of rectangles	Calculating the perimeters of rectangles
	Estimate & measure areas of rectangles	Areas of rectangles in square cm or m
	Relationship between area & perimeter	Solving perimeter & area problems
	Area of rectangles	Finding the area of rectangles

Patterns: Awareness of patterns supports problem solving in various situations

Outcome	Quests	Content
Students relate terms to position within an arithmetic sequence.	Patterns in tables of values & graphs	Creating a table of values, visual pattern
		Representing linear patterns, tables & graphs
	Relationships within tables	Determining missing values in a table of values
	Manipulate sets of numbers given a rule	Manipulating sets of numbers using a given rule
	Linear growth pattern	Making predictions about linear growing patterns
Algebraic expressions for patterns	Algebraic expressions for patterns	

Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.

Outcome	Quests	Content
Students analyze frequency in categorical data.	Theoretical & experimental probability	Comparing observed & expected frequencies
	Data collection	Data collection: questionnaires
	Select & interpret data displays	Selecting data displays
		Interpreting data & solving problems

Grade 6

Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating

Outcome	Quests	Content
Students investigate magnitude with positive and negative numbers.	Read & represent integers	Investigating integers
		Understanding integers in real-life contexts
		Comparing & ordering integers
		Describing the direction & magnitude of integers
		Understanding opposites in context
	Add & subtract integers	Adding & subtracting integers
		Adding & subtracting integers, word problems
		Adding & subtracting integers visually
		Adding & subtracting integers on a number line
		Adding integers
		Subtracting integers
		Adding & subtracting integers, order of operations
Students solve problems using standard algorithms for addition and subtraction.	Create add sub number sentences	Creating addition & subtraction number sentences
	Addition & subtraction word problems	Solving addition word problems
		Solving subtraction word problems
		Solving addition & subtraction word problems
Students analyze numbers using prime factorization and exponentiation.	Prime factors	Using prime factors
		Using index notation to identify prime factors
		Finding GCM from prime factors
Students apply standard algorithms to multiplication and division of decimal and natural numbers.	Multiply whole numbers & decimals	Multiply 4 digits by 1- & 2-digit whole numbers
		Multiplying decimals
		Multiplying decimals using place value
	Division of whole numbers & decimals	Divide up to 4 digits by a 2-digit divisor
		Dividing decimals

Students relate fractions to quotients.	Divide to convert fractions to decimals	Converting fractions to decimals using division
Students add and subtract fractions with denominators within 100.	Mixed numerals with common denominators	Adding mixed numerals with common denominators
		Subtract mixed numerals with common denominators
	Proper fractions - unlike denominators	Adding proper fractions with unlike denominators
		Subtract proper fractions - unlike denominators
	Improper fractions - unlike denominators	Adding improper fractions with unlike denominators
		Subtract improper fractions - unlike denominators
Students interpret the multiplication of natural numbers by fractions.	Multiply fractions	Multiplying unit fractions by whole numbers
		Multiplying proper fractions by whole numbers
		Multiplying mixed numerals by whole numbers
		Multiplying improper fractions by whole numbers
		Multiplying various fractions
Students apply equivalence to the interpretation of ratios and rates.	Introduction to ratios	Simplifying ratios
		Dividing a quantity into a given ratio
		Identifying equivalent ratios
	Calculate percentages of whole numbers	Calculating simple percentages
	Percents, fractions & decimals	Solving word problems involving percentages

Algebra: Equations express relationships between quantities

Outcome	Quests	Content
Students analyze expressions and solve algebraic equations.	Patterns, expressions & equations	Writing an equation to represent a table of values
		Writing expressions, rule for a pattern
	Understand variables	Matching equations & word problems
		Writing & solving equations given a problem
	Preservation of equality	Solving 1-step equations
		Solving 1-step equations using a balance
		Solving 1-step equations using algebra tiles
		Understanding the preservation of equality
		Creating equivalent forms of an equation
	Order of operations	Order of operations, addition & subtraction
		Apply order of operations to evaluate expressions
	Simplify algebraic expressions	Simplifying algebraic expressions
	Create algebraic expressions	Creating algebraic expressions

Geometry: Shapes are defined and related by geometric attributes.

Outcome	Quests	Content
Students analyze shapes through symmetry and congruence	Combinations of transformations	Identifying combinations of transformations
	Rotational symmetry	Determining rotational symmetry
	Recognize tessellations	Recognizing tessellations
	Introduction of congruence	Introducing congruence

Coordinate Geometry: Location and movement of objects in space can be communicated using a coordinate grid.

Outcome	Quests	Content
Students explain location and movement in relation to position in the Cartesian plane.	The Cartesian plane	Introducing Cartesian coordinates
		Drawing shapes on the coordinate plane
		Plotting & stating the coordinates of a point
	Transformations in the first quadrant	Investigating translations in the first quadrant
		Identifying reflections in the first quadrant
		Identifying rotations in the first quadrant
	Record positions of reflected points	Recording the positions of reflected points

Measurement: Attributes such as length, area, volume, and angle are quantified by measurement

Outcome	Quests	Content
Students analyze areas of parallelograms and triangles.	Determine the area	Determining the area of a triangle
		Determining the area of a parallelogram
Students interpret and express volume.	Measure volume in cubic units	Using unit cubes to measure volume
		Using cubic cm & m to measure volume
		Estimating volume using cubic cm & m
	Volume of prisms	Finding the volume of rectangular prisms
		Finding the volume of any prism
		Finding the missing dimension, rectangular prisms

Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.

Outcome	Quests	Content
Students investigate relative frequency using experimental data.	Theoretical & experimental probability	Probability of 0 & 1
		Predicting the probability of a specific outcome
		Listing the sample space for an event
		Understanding independent events
		Determining theoretical probability, tree diagrams
		Exploring fair games
	Probability: decimals/ fractions/ percents	Probability: decimals, fractions & percents
	Relative frequency	Understanding & calculating relative frequency



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