Mathletics Alberta Program of Studies Skill Quests



Grades 4 – 6



August, 2022

Mathletics

Alberta Program of Studies Skill Quests August, 2022

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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	Decimals to hundredths	Introducing decimal notation
decimal numbers		Decimal tenths
		Decimal hundredths
		Rounding decimals
		Comparing decimals
		Partitioning decimals
Students add and subtract within	Addition to 10 000	Adding up to 1000 bar models
10 000, including decimal numbers		Adding up to 10 000 jump
to hundredths		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	Solving addition & subtraction
	problems	word problems
	Check accuracy with	Estimating addition &
	estimation	subtraction
	Add & subtract	Adding decimals to tenths
	decimals to hundreaths	Suptracting decimals
	Use decimals in the	Using decimals in money
	context of money	Estimating & calculating
		change

		Solving money word problems
Students explain properties of prime and composite numbers	Prime & composite numbers	Introducing prime & composite numbers
using multiplication and division.	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	Multiplication & division	Multiplying by 6
natural numbers within 10 000.	facts for 6	Dividing by 6
		Multiplying & dividing by 6
	Multiplication & division	Multiplying by 7
	facts for 7	Dividing by 7
		Multiplying & dividing by 7
	Multiplication & division	Multiplying by 8
	facts for 8	Dividing by 8
		Multiplying & dividing by 8
	Multiplication & division	Multiplying by 9
	facts for 9	Dividing by 9
		Multiplying & dividing by 9
	Multiplication & division	Multiplying by 11
	facts for 11	Dividing by 11
		Multiplying & dividing by 11
	Multiplication & division	Multiplying by 12
	facts for 12	Dividing by 12
		Multiplying & dividing by 12
	Multiplication & division patterns	Multiplying & dividing with multiples of 10 or 100
	Multiplication, 2- or 3-	Multiplying 2- or 3-digits by
	digit by 1-digit	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,
		Multiplying by multiples of 10
		& 100
	Multiplication	Selecting multiplying
	strategies	strutegies

	Division 2-digit by 1-	Dividing 2-digits by 1-digit
	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	Solving multiplication &
	word problems	division word problems
Students apply equivalence to the	Equivalent fractions	Using models to find
interpretation of fractions.		equivalent fractions
		Using mult div to find
		equivalent fractions
		Using a number line to find
		equivalent fractions
	Compare & order	Comparing unit fractions
	fractions	Comparing & ordering proper
	Delete de size els 8	Tractions
	fractions	Relating decimals & fractions
	Simplify proper	Using common factors to
	fractions	simplify fractions
Students interpret percentages.	Whole-number	Introducing percentages
	percentages	······································
	Express percentage	Fractions as percentages
	representations	Decimals as percentages
		Comparing & ordering
		percentages
		Representing fractions &
		decimals

Algebra: Equations express relationships between quantities.

Outcome	Quests	Content
Students represent and apply	Introduce order of	Order of operations (addition
equality in multiple ways.	operations	& 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	Features of 2-D shapes	Identifying features on 3-D
geometric properties.	& 3-D objects	objects
	Compare, describe &	Comparing, describing &
	name 3-D shapes	naming 3-D shapes
	Identify & sort	Sorting & naming
	quadrilaterals	quadrilaterals
		Classifying quadrilaterals
	Classify triangles	Classifying triangles by their
		sides & angles
	Classify & sort plane	Classifying plane shapes by
	shapes	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	Measure the area	Estimating & comparing area
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	Measure & classify	Measuring & estimating
angles using standard units.	angles	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	Represent, analyze &	Additive & subtractive number
arithmetic and geometric	apply patterns	patterns
sequences.		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	Duration of events	Introducing timelines
with standard units of time.		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	Data collection	Collecting & sorting data
in graphical representations of	Graphs using many-to-	Using bar graph with many-
data.	one correspondence	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	Evaluating & comparing data
	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	Decimals to thousandths	Understanding decimals to
value.		thousandths
		bundrodths
	Compare & order	Comparing & ordering
	decimals to	decimals to thousandths
	thousandths	
	Dividing by multiples of	Dividing whole numbers by
	10	multiples of 10
		Partitioning decimals to
		thousandths
	1 000 000	place value
		Reading & writing numbers up
		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	Counting up to 10 000 000
	10 000 000	Reading & writing numbers to
		8 digits
		Identifying place value 8-digit
		numbers
		7-digit numbers
		Comparing & ordering
		numbers up to 7 digits
		Rounding numbers up to 7
		digits
	Strategies for	Rounding 4- & 5-digit
	estimation	numbers
		Rounding numbers up to
		6-digits
		Rounding decimals

Students add and subtract within 1 000 000, including decimal	Strategies for computation	Using compensation to add & subtract
numbers to thousandths, using standard algorithms.		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	Adding decimals to thousandths
	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
		aiviaing by 5
		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,	Divide up to 3-digits by 1-digit	Dividing up to 3-digit by 1-digit, no remainders
including with standard algorithms		Dividing up to 3-digit by
		1-digit, with remainders
		Dividing by partitioning, no
		remainders
		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	Multiplying 1-digit numbers
	multiples of 1000	with multiples of 1000
		Dividing 1-digit numbers with
	Multiply 4-digit by	Multiply 4-digits by 1-digit
	1-digit	using split method
	1 aigit	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-	Multiplying 2-digits by
	digits by 2-digits	2-digits, area model
		Multiplying 2-digits by
		2-uigits, factorizing
		2-digits use known facts
		Multiply or divide with
		multiples of 10 or 100
		Multiplying 2-diaits 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	Classify fractions	Identifying fractions
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	Add fractions & mixed numbers	Adding fractions, like denominator
denominators.		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	Introduction to	Introducing algebraic
algebraic expressions.	algebraic expressions	expressions
	Evaluate an expression	Evaluating expressions using
		substitution
	Linear equations,	Solving linear equations with
	integers	integers
	Equations with letter	Expressing word problems as
	variables	equations
	One-step equations	Writing one-step equations
	with variables	using variables
		Solving one-step equations &
		word problems
		Solving one-step equations
		using bar model
	Write multi-step	Writing multi-step numerical
	numerical expressions	expressions

Geometry: Shapes are defined and related by geometric attributes.

Outcome	Quests	Content
Students investigate symmetry as a	Recognize & draw line	Recognizing line symmetry
geometric property.	symmetry	Identifying & drawing lines of
		symmetry
	Recognise rotational	Recognising rotational
	symmetry	symmetry
	Order rotational	Ordering rotational symmetry
	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	Introduction of formal	Introducing the square
area using standard units	units for area	centimetre & square metre
	Perimeters of	Calculating the perimeters of
	rectangles	rectangles
	Estimate & measure	Areas of rectangles in square
	areas of rectangles	cm or m
	Relationship between	Solving perimeter & area
	area & perimeter	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	Selecting data displays
	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	Read & represent	Investigating integers
with positive and negative	integers	Understanding integers in
numbers.	-	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
		Adding & subtracting integers
		Adding & subtracting integers
		Adding integers
		Adding integers
		Adding & subtracting integers
		Adding & subtracting integers,
Studente colve probleme using	Create add sub number	Creating addition &
students solve problems using	create add sub humber	cubtraction number contoncos
and subtraction	Addition & subtraction	Solving addition word
	word problems	problems
		Solving subtraction word
		problems
		Solving addition & subtraction
		word problems
Students analyze numbers using	Prime factors	Using prime factors
prime factorization and		Using index notation to
exponentiation.		identify prime factors
		Finding GCM from prime
		factors
Students apply standard algorithms	Multiply whole	Multiply 4 digits by 1- & 2-digit
to multiplication and division of	numbers & decimals	whole numbers
decimal and natural numbers.		Multiplying decimals
		Multiplying decimals using
		place value
	Division of whole	Divide up to 4 digits by a
	numbers & decimals	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	Mixed numerals with common denominators	Adding mixed numerals with common denominators
100.		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	Introduction to ratios	Simplifying ratios
interpretation of ratios and rates.		Dividing a quantity into a
		Identifying equivalent ratios
	Calculate percentages	
	of whole numbers	percentages
	Percents, fractions &	Solving word problems
	decimals	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	Simplifying algebraic
	expressions	expressions
	Create algebraic expressions	Creating algebraic expressions

Geometry: Shapes are defined and related by geometric attributes.

Outcome	Quests	Content
Students analyze shapes through	Combinations of	Identifying combinations of
symmetry and congruence	transformations	transformations
	Rotational symmetry	Determining rotational
		symmetry
	Recognize tessellations	Recognizing tessellations
	Introduction of	Introducing congruence
	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	Investigating translations in
	first quadrant	the first quadrant
		Identifying reflections in the
		first quadrant
		Identifying rotations in the first
		quadrant
	Record positions of	Recording the positions of
	reflected points	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/	Probability: decimals, fractions
	fractions/ percents	& percents
	Relative frequency	Understanding & calculating
		relative frequency
		Representing data using
		relative frequency



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