

Mathletics Saskatchewan Program of Studies

Understanding Practice and Fluency (UPF)



Grades 7 – 8
October, 2021

Mathletics

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Grade 7

1 Number

Outcome	Quests	Content
1. Demonstrate an understanding of division through the development and application of divisibility strategies for 2, 3, 4, 5, 6, 8, 9, and 10, and through an analysis of division involving zero.	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
2. Expand and demonstrate understanding of the addition, subtraction, multiplication, and division of decimals to greater numbers of decimal places, and the order of operations.	Operations with decimals	Solving decimal word problems, 4 operations
		Adding decimals
		Subtracting decimals
		Multiplying decimals
		Multiplying decimals, place value
		Dividing decimals
		Order of operations, decimals
3. Demonstrate an understanding of the relationships between positive decimals, positive fractions (including mixed numbers, proper fractions and improper fractions), and whole numbers.	Decimals & fractions	Investigating terminating & repeating decimals
		Ordering fractions & decimals on a number line
		Converting terminating decimals to fractions
		Converting repeating decimals to fractions
		Converting fractions to terminating decimals
		Converting fractions to repeating decimals
		Identifying a number between 2 given numbers

		Comparing & ordering proper fractions
		Ordering terminating & repeating decimals
4. Expand and demonstrate an understanding of percent to include fractional percents between 1% and 100%.	Percents, fractions & decimals	Solving word problems involving percentages
		Converting percents into fractions & decimals
5. Develop and demonstrate an understanding of adding and subtracting positive fractions and mixed numbers, with like and unlike denominators, concretely, pictorially, and symbolically (limited to positive sums and differences).	Add fractions & mixed numbers	Adding fractions, like denominator
		Adding a whole number & a fraction
		Adding improper fractions, like denominator
		Adding with mixed numbers, like denominator
		Adding fractions, unlike denominator
		Adding improper fractions, unlike denominator
		Adding with mixed numbers, unlike 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
		Subtracting fractions, unlike denominator
		Subtracting improper fractions, unlike denominator
		Subtracting with mixed numbers, unlike denominator
	Add & subtract fractions, word problems	Adding & subtracting fractions, word problems
6. Demonstrate an understanding of addition and subtraction of integers, concretely, pictorially, and symbolically.	Understand integers	Investigating integers
		Comparing & ordering integers
		Understanding opposites in context
	Add & subtract integers	Adding & subtracting negative integers
		Adding & subtracting integers, word problems
		Adding integers with two-coloured counters

		Adding & subtracting integers, number line
		Adding integers
		Subtracting integers
		Adding & subtracting integers, order of operations

2 Patterns and Relations

Outcome	Quests	Content
1. Demonstrate an understanding of the relationships between oral and written patterns, graphs and linear relations.	Discrete linear relations	Graphing discrete linear relations using a table
		Matching graphs & linear relations
		Creating tables of values for linear relations
2. Demonstrate an understanding of equations and expressions by: distinguishing between equations and expressions, evaluating expressions, verifying solutions to equations.	Equations & expressions	Evaluating expressions using substitution
		Checking solutions of two-step equations
		Distinguishing between expressions & equations
		Identifying parts of expressions & equations
3. Demonstrate an understanding of one- and two-step linear equations of the form $ax/b + c = d$ (where a , b , c , and d are whole numbers, $c \leq d$ and $b \neq 0$) by modeling the solution of the equations concretely, pictorially, physically, and symbolically and explaining the solution in terms of the preservation of equality.	Linear equations, whole numbers	Understanding the preservation of equality
		Solving 2-step equations
		Modeling & solving 2-step equations, algebra tiles
		Modeling real-life scenarios using equations
		Solving 1-step equations
		Solving 1-step equations using a balance
		Solving 1-step equations using algebra tiles
4. Demonstrate an understanding of linear equations of the form $x + a = b$ (where a and b are integers) by modeling problems as a linear equation and solving the problems concretely, pictorially, and symbolically.	Linear equations, integers	Solving linear equations with integers
		Modeling & solving 1-step equations, algebra tiles

3 Shape and Space

Outcome	Quests	Content
1. Demonstrate an understanding of circles including circumference and central angles.	Circles	Finding the circumference of circles
		Introducing the parts of a circle
		Introducing circumference
		Sum of the central angles of a circle
2. Develop and apply formulas for determining the area of: triangles, parallelograms, circles.	Determine the area	Determining the area of a triangle
		Determining the area of a parallelogram
		Determining the area of a circle
3. Demonstrate an understanding of 2-D relationships involving lines and angles.	Lines & angles	Identifying parallel & perpendicular lines
4. Demonstrate an understanding of the Cartesian plane and ordered pairs with integral coordinates.	The Cartesian plane	Introducing Cartesian coordinates
		Drawing shapes on the coordinate plane
5. Expand and demonstrate an understanding of transformations (translations, rotations, and reflections) of 2-D shapes in all four quadrants of the Cartesian plane.	Transformations on the Cartesian plane	Successive translations on the coordinate plane
		Rotations on the coordinate plane
		Reflections on the coordinate plane
		Combinations of transformations

4 Statistics and Probability

Outcome	Quests	Content
1. Demonstrate an understanding of the measures of central tendency and range for sets of data.	Measures of central tendency & range	Understanding mean
		Understanding median
		Understanding mode
		Understanding range
		Choosing statistical measures for data
	Investigating the effect of outliers	
2. Demonstrate an understanding of circle graphs.	Circle graphs	Interpreting & constructing circle graphs
3. Demonstrate an understanding of theoretical and experimental probabilities for two independent events where the combined sample space has 36 or fewer elements.	Theoretical & experimental probability	Understanding independent events
		Determining theoretical probability, tree diagrams
		Identifying the sample space
		Exploring fair games
	Probability: decimals, fractions & percents	

Grade 8

1 Number

Outcome	Quests	Content
1. Demonstrate understanding of the square and principle square root of whole numbers concretely or pictorially and symbolically.	Squares & square roots	Perfect squares
		Finding square roots
		Finding square roots, fractions
		Estimating square roots
2. Expand and demonstrate understanding of percents greater than or equal to 0% (including fractional and decimal percents) concretely, pictorially, and symbolically.	Percents greater than or equal to 0%	Percents greater than 100%
		Converting percents to fractions & mixed numbers
		Converting percents to decimals
		Solving problems involving consecutive percents
		Increasing & decreasing amounts by percents
		Solving problems involving combined percents
3. Demonstrate understanding of rates, ratios, and proportional reasoning concretely, pictorially, and symbolically.	Rates, ratios & proportional reasoning	Unit rate
		Introduction to ratios
		Simplifying & comparing rates
		Solving rate problems
		Dividing a quantity in a given ratio
		Solving ratio problems
4. Demonstrate understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially, and symbolically.	Multiply fractions & mixed numbers	Multiplying unit fractions by whole numbers
		Multiplying proper fractions by whole numbers
		Multiplying mixed numbers by whole numbers
		Multiplying fractions
		Multiplying mixed numbers
	Divide fractions & mixed numbers	Dividing fractions & whole numbers
		Dividing fractions
		Dividing whole numbers & mixed numbers
		Dividing mixed numbers & fractions
		Dividing mixed numbers
		Dividing fractions, word problems

5. Demonstrate understanding of multiplication and division of integers concretely, pictorially, and symbolically.	Multiply & divide integers	Multiplying integers
		Dividing integers
		Multiplying & dividing integers
		Multiplying integers using models
		Dividing integers using models

2 Patterns and Relations

Outcome	Quests	Content
1. Demonstrate understanding of linear relations concretely, pictorially (including graphs), physically, and symbolically.	Linear relations	Graphing discrete linear relations
		Identify an equation from a discrete linear graph
		Graphing a linear relation using a table of values
2. Model and solve problems using linear equations of the form: $ax = b$, $x/a = b$, $a \neq 0$, $ax + b = c$, $x/a + b = c$, $a \neq 0$, $a(x + b) = c$ concretely, pictorially, and symbolically, where a , b , and c are integers.	Linear equations, integers	Modelling & solving 2-step linear equations
		Solving linear equation word problems
		Solving 2-step linear equations, mixed operations
		Solving 1-step linear equations, add & subtract
		Solving 1-step linear equations, multiply & divide
		Solving 1-step linear equations, mixed operations
		Solving linear equations, distributive property
		Checking solutions using substitution

3 Shape and Space

Outcome	Quests	Content
1. Demonstrate understanding of the Pythagorean Theorem concretely or pictorially and symbolically and by solving problems.	Pythagorean Theorem	Identifying the sides of a right triangle
		Converse of the Pythagorean Theorem
		Finding the length of the missing side, short side
		Finding the length of the missing side, hypotenuse
		Finding the length of the missing side
		Matching right triangles to word problems
		Identifying Pythagorean triples
2. Demonstrate understanding of the surface area of 3-D objects limited to right prisms and cylinders (concretely, pictorially, and symbolically) by: analyzing views, sketching and constructing 3-D objects, nets, and top, side, and front views, generalizing strategies and formulae, analyzing the effect of orientation, solving problems.	Surface area	Finding the surface area of rectangular prisms
		Finding the surface area of triangular prisms
		Finding the surface area of cylinders
	Construction, views & nets: 3-D objects	Drawing top, front & side views of 3-D objects
		Connecting prisms with their nets
		Connecting 3-D objects with their nets
3. Demonstrate understanding of volume limited to right prisms and cylinders (concretely, pictorially, or symbolically) by: relating area to volume, generalizing strategies and formulae, analyzing the effect of orientation, solving problems.	Volume	Finding the volume of cubes & rectangular prisms
		Finding the volume of triangular prisms
		Finding the volume of cylinders
		Solving volume problems, right prisms & cylinders
4. Demonstrate an understanding of tessellation by: explaining the properties of shapes that make tessellating possible, creating tessellations, identifying tessellations in the environment.	Tessellation	Investigating tessellations using transformations
		Recognizing tessellations

4 Statistics and Probability

Outcome	Quests	Content
1. Analyze the modes of displaying data and the reasonableness of conclusions.	Analyze data displays	Analyzing misleading data displays
2. Demonstrate understanding of the probability of independent events concretely, pictorially, orally, and symbolically.	Probability of independent events	Finding the probability of 2 independent events



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