

Mathletics Pennsylvania Program of Studies

Skill Quests

Grades 3 – 6
July, 2022

Mathletics

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Pennsylvania Program of Studies

Skill Quests

July 2022

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Grade 3

1 Numbers and Operations

1.1 Numbers and Operations in Base Ten

Outcome	Quests	Content			
CC.2.1.3.B.1 Apply place-value understanding and properties of operations to perform multi-digit arithmetic.	Round to the nearest 10 or 100	Rounding numbers up to 1000 to the nearest 100			
		Rounding numbers up to 1000 to the nearest 10			
	Add within 1000	Adding 2-digit & 3-digit numbers: number line	Adding 2-digit & 3-digit numbers: jump strategy		
			Adding two 2-digit numbers: base ten blocks		
			Adding 2-digit & 3-digit numbers: expanded form		
			Adding two 2-digit numbers: compensation		
			Add & subtract within 1000	Add & subtract up to 3-digits: number line	Add & subtract up to 3-digits: jump strategy
					Add & subtract two 2-digits: place value blocks
	Add & subtract within 1000	Add & subtract up to 3-digits: expanded form	Add & subtract two 2-digit numbers: compensation		

1.2 Numbers and Operations – Fractions

Outcome	Quests	Content
CC.2.1.3.C.1 Explore and develop an understanding of fractions as numbers.	Introduction to fractions	Introducing the numerator & denominator
		Introducing eighths
		Halves, quarters & eighths of objects or shapes
		Halves, thirds or quarters of shapes: partitioning
		Introducing sixths

		Thirds & sixths of objects, shapes & sets
	Locate unit fractions on a number line	Locating unit fractions on a number line
	Locate fractions on a number line	Locating fractions on a number line
	Investigate equivalent fractions	Investigating equivalent fractions
	Find simple equivalent fractions	Recognize & generate simple equivalent fractions
	Whole numbers as fractions	Express & recognize whole numbers as fractions
	Compare fractions	Comparing fractions: same numerator or denominator

2 Algebraic Concepts

2.1 Operations and Algebraic Thinking

Outcome	Quests	Content
CC.2.2.3.A.1 Represent and solve problems involving multiplication and division.	Introduction to multiplication	Multiplying using arrays & repeated addition
	Introduction to division	Dividing by sharing (up to 50)
		Dividing by grouping (up to 50)
		Creating & solving problems involving equal groups
		Using repeated subtraction to divide
CC.2.2.3.A.2 Understand properties of multiplication and the relationship between multiplication and division.	Multiplication properties	Multiplication properties
	Relation between multiplying & dividing	Relation between multiplication & division
CC.2.2.3.A.3 Demonstrate multiplication and division fluency.	Multiplication & division facts	Multiplication facts: 2, 4, 8
		Multiplication facts: 5, 10
		Multiplication facts: 3, 6, 9
		Multiplication facts: 7
		Recalling multiplication facts to 5 x 5
		Recalling multiplication facts to 10 x 10
		Division facts: 2, 4, 8
		Division facts: 5, 10
		Division facts: 3, 6, 9
Division facts: 7		
CC.2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic.	2-step word problems: 4 operations	2-step word problems with the 4 operations
	Number patterns	Identifying & creating number patterns

3 Geometry

3.1 Geometry

Outcome	Quests	Content
CC.2.3.3.A.1 Identify, compare, and classify shapes and their attributes.	Shapes & their attributes	Sorting & naming quadrilaterals
		Comparing & describing two-dimensional shapes
CC.2.3.3.A.2 Use the understanding of fractions to partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole.	Partition shapes	Partition shapes into parts with equal areas

4 Measurement, Data, and Probability

4.1 Measurement and Data

Outcome	Quests	Content
CC.2.4.3.A.1 Solve problems involving measurement and estimation of temperature, liquid volume, mass, and length.	Liquid volume	Estimating, comparing & measuring in liters
		Liquid volume: milliliters
		Solving word problems involving liquid volume
	Mass	Mass: kilograms
		Mass: grams
		Mass: measuring in grams & kilograms
	Measure temperature	Measuring temperature
Solving 1-step word problems involving mass		
CC.2.4.3.A.2 Tell and write time to the nearest minute and solve problems by calculating time intervals.	Tell & write time	Telling & writing time
	Calculate elapsed time	Calculating elapsed time
	Use real-world timetables	Using real-world timetables
CC.2.4.3.A.3 Solve problems and make change involving money using a combination of coins and bills.	Money word problems	Money word problems
CC.2.4.3.A.4 Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.	Scaled picture & bar graphs	Reading & representing data: scaled picture graph
		Reading & representing data: scaled bar graph
	Represent & read line plots	Representing & reading line plots
CC.2.4.3.A.5 Determine the area of a rectangle and apply the concept to multiplication and to addition.	Find the area with repeated addition	Finding the area of rectangles, repeated addition
	Area problems: multiplication	Solving area problems using multiplication
CC.2.4.3.A.6 Solve problems involving perimeters of polygons and distinguish between linear and area measures.	Perimeter problems	Finding the perimeter & area of rectangles
		Relating perimeter & area
		Introducing perimeter
		Finding the perimeter of rectangles
		Finding a missing side length given the perimeter
		Finding the perimeter of polygons

Grade 4

1 Numbers and Operations

1.1 Numbers and Operations in Base Ten

Outcome	Quests	Content
CC.2.1.4.B.1 Apply place-value concepts to show an understanding of multidigit whole numbers.	Place value for multi-digit numbers	Generalizing place value understanding
		Reading & writing 6-digit numbers
		Comparing & ordering 6-digit numbers
		Rounding 6-digit numbers
CC.2.1.4.B.2 Use place-value understanding and properties of operations to perform multi-digit arithmetic.	Add multi-digit numbers	Adding multi-digit numbers, no regrouping
		Adding multi-digit numbers, regrouping
	Subtract multi-digit numbers	Subtracting multi-digit numbers, no regrouping
		Subtracting multi-digit numbers, regrouping
	Multiply multi-digit numbers	Multiplying multi-digit numbers, algorithm
		Multiplying multi-digit numbers using place value
		Multiplying multi-digit numbers, area model
	Divide multi-digit numbers	Dividing numbers, place value blocks
		Dividing numbers, area model
		Dividing numbers, place value strategy
		Introducing remainders in division

1.2 Numbers and Operations – Fractions

Outcome	Quests	Content
CC.2.1.4.C.1 Extend the understanding of fractions to show equivalence and ordering.	Fraction equivalence	Equivalent fractions with models
		Equivalent fractions with multiplication

	Compare fractions	Comparing fractions using models
		Compare fractions, different numerator/denominator
		Comparing fractions using common denominators
CC.2.1.4.C.2 Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	Understand adding/subtracting fractions	Adding unit fractions, same denominators: models
		Adding fractions, same denominator
		Subtracting fractions, same denominator
		Adding & subtracting fractions, same denominator
	Decompose fractions	Decomposing fractions
	Add & subtract mixed numbers	Adding mixed numbers, same denominator
		Subtracting mixed numbers, same denominator
	Word problems: add & subtract fractions	Word problems: adding & subtracting fractions
	Fractions: multiples of unit fractions	Fractions: multiples of unit fractions
	Multiply fractions by whole numbers	Multiply fractions by whole numbers using models
Word problems: multiply fractions	Word problems: multiply fractions by whole numbers	
CC.2.1.4.C.3 Connect decimal notation to fractions, and compare decimal fractions.	Introduce decimal notation	Introducing decimal notation
	Fractions as decimals	Introducing tenths

2 Algebraic Concepts

2.1 Operations and Algebraic Thinking

Outcome	Quests	Content
CC.2.2.4.A.1 Represent and solve problems involving the four operations.	Word problems: 4 operations	Multi-step multiplication/division word problems
		Solving division word problems
		Solving multiplication word problems
		2-step addition & subtraction word problems
CC.2.2.4.A.2 Develop and/or apply number theory concepts to find factors and multiples.	Factors, multiples & prime numbers	Finding multiples: whole numbers up to 100
		Finding factors: whole numbers up to 100
		Prime & composite numbers
CC.2.2.4.A.4 Generate and analyze patterns using one rule.	Number & shape patterns	Generating shape patterns from a given rule
		Generating addition patterns from a given rule
		Generating subtraction patterns from a given rule
		Generate multiplication patterns from a given rule

3 Geometry

3.1 Geometry

Outcome	Quests	Content
CC.2.3.4.A.1 Draw lines and angles and identify these in two-dimensional figures.	Spatial features in 2-D figures	Classifying angles
		Labeling points & lines
		Identifying spatial features in 2-D shapes
C.2.3.4.A.2 Classify two-dimensional figures by properties of their lines and angles.	Classify 2-D figures	Classifying plane shapes by their spatial features
		Classifying quadrilaterals
		Classifying triangles by their sides & angles
CC.2.3.4.A.3 Recognize symmetric shapes and draw lines of symmetry.	Lines of symmetry	Lines of symmetry

4 Measurement, Data, and Probability

4.1 Measurement and Data

Outcome	Quests	Content
CC.2.4.4.A.1 Solve problems involving measurement and conversions from a larger unit to a smaller unit.	Convert units of measure	Units of length: mm/cm/m/km
		Units of mass: g/kg & oz/lb
		Units of time: sec/min/hr & day/week/year
		Units of volume & capacity: mL/L
	Area & perimeter	Finding the area of a rectangle, formula
Finding the perimeter of a rectangle, formula		
CC.2.4.4.A.2 Translate information from one type of data display to another.	Translate to different data displays	Translating to different data displays
CC.2.4.4.A.4 Represent and interpret data involving fractions using information provided in a line plot.	Fractions on a line plot	Fractions on a line plot
CC.2.4.4.A.6 Measure angles and use properties of adjacent angles to solve problems.	Measure & estimate angles	Measuring & estimating angles
	Problems with adjacent angles	Solving problems with adjacent angles

Grade 5

1 Numbers and Operations

1.1 Numbers and Operations in Base Ten

Outcome	Quests	Content
CC.2.1.5.B.1 Apply place-value concepts to show an understanding of operations and rounding as they pertain to whole numbers and decimals.	The place value system	Identifying the place value of a digit in a number Understanding the place value system: powers of 10
	Multiply & divide by powers of 10	Multiplying decimals by powers of 10
		Dividing decimals by powers of 10
		Writing numbers using powers of 10
	Read & write decimals to thousandths	Reading & writing decimals to thousandths
	Compare decimals to thousandths	Comparing & ordering decimals to thousandths
	Round decimals	Rounding decimals
CC.2.1.5.B.2 Extend an understanding of operations with whole numbers to perform operations including decimals.	Multiply multi-digit numbers, algorithm	Multiplying multi-digit numbers, algorithm
	Divide multi-digit numbers	Dividing multi-digit numbers, algorithm
	Operations with decimals	Adding decimals to hundredths, algorithm
		Subtracting decimals using mental strategies
		Subtracting decimals to hundredths, algorithm
		Multiplying decimals & whole numbers
		Multiplying decimals to hundredths, algorithm
		Multiplying decimals using mental strategies
		Multiplicative relationships with decimals
		Divide whole numbers & decimals, mental strategies
Dividing whole numbers & decimals, algorithm		

1.2 Numbers and Operations – Fractions

Outcome	Quests	Content
CC.2.1.5.C.1 Use the understanding of equivalency to add and subtract fractions.	Add & subtract fractions	Adding fractions & mixed numbers
		Subtracting fractions & mixed numbers
		Adding & subtracting fractions & mixed numbers
		Adding fractions, proper & improper
		Adding mixed numbers
		Subtracting fractions, proper & improper
		Subtracting mixed numbers
CC.2.1.5.C.2 Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Multiply fractions	Multiplying a fraction by a whole number
		Multiplying a fraction by a fraction
	Effects of multiplying fractions	Interpreting multiplying fractions as scaling
	Fractions as division	Interpreting fractions as division
	Divide unit fractions by whole numbers	Dividing unit fractions by whole numbers, models
	Divide whole numbers by unit fractions	Dividing whole numbers by unit fractions, models

2 Algebraic Concepts

2.1 Operations and Algebraic Thinking

Outcome	Quests	Content
CC.2.2.5.A.1 Interpret and evaluate numerical expressions using order of operations.	Grouping symbols	Order of operations with grouping symbols
CC.2.2.5.A.4 Analyze patterns and relationships using two rules.	Numerical patterns	Comparing numerical patterns
		Interpreting & creating a number pattern table
		Graphing ordered pairs from numerical patterns

3 Geometry

3.1 Geometry

Outcome	Quests	Content
CC.2.3.5.A.1 Graph points in the first quadrant on the coordinate plane and interpret these points when solving real world and mathematical problems.	Graph in the first quadrant	Graphing in the first quadrant
CC.2.3.5.A.2 Classify two-dimensional figures into categories based on an understanding of their properties.	Attributes of 2-D figures	Sorting plane shapes

4 Measurement, Data, and Probability

4.1 Measurement and Data

Outcome	Quests	Content
CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.	Convert measurement units	Converting between standard metric units of length
		Converting between standard metric units of mass
		Converting metric units of volume & capacity
		Converting between customary units of length
		Converting customary units of volume & capacity
		Converting between customary units of mass
		Word problems: measurement conversions
CC.2.4.5.A.2 Represent and interpret data using appropriate scale.	Represent and interpret data	Representing data in picture graphs
		Collecting, recording & interpreting data
		Constructing line graphs
CC.2.4.5.A.4 Solve problems involving computation of fractions using information provided in a line plot.	Fraction problems: line plots	Represent & interpret measurements: line plots
CC.2.4.5.A.5 Apply concepts of volume to solve problems and relate volume to multiplication and to addition.	Measure volume with unit cubes	Measuring volume: unit cubes & cubic centimeters
	Volume: rectangular prisms	Volume: additive & multiplicative strategies
	Volume formulas: rectangular prism	Applying volume formulas for rectangular prisms
	Volume: composite rectangular prisms	Volume of composite rectangular prisms

Grade 6

1 Numbers and Operations

1.1 Ratios and Proportional Relationships

Outcome	Quests	Content
CC.2.1.6.D.1 Understand ratio concepts and use ratio reasoning to solve problems.	Introduction to ratios	Defining, understanding & writing ratios

1.2 The Number System

Outcome	Quests	Content
CC.2.1.6.E.1 Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	Divide fractions	Dividing a fraction by a fraction
		Dividing fractions & mixed numbers
		Solving word problems: division of fractions
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.	Multiply multi-digit numbers, algorithm	Multiplying multi-digit numbers, algorithm
	Divide multi-digit numbers, algorithm	Divide 4-digit by 2-digit numbers, no remainder
		Divide 4-digit by 2-digit numbers, with remainders
		Divide 4-digit by 2-digit numbers
	Operations with multi-digit decimals	Adding decimals using the standard algorithm
		Subtracting decimals using the standard algorithm
		Multiplying decimals using the standard algorithm
		Dividing decimals using the standard algorithm
		Word problems: adding & subtracting decimals
	Word problems: multiplying & dividing decimals	

CC.2.1.6.E.3 Develop and/or apply number theory concepts to find common factors and multiples.	GCF & LCM	Greatest common factor
		Least common multiple
		Solving word problems: factors & multiples
		Factoring using the distributive property
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.	Positive & negative numbers	Investigating & interpreting integers
	Opposites on the number line	Opposites on the number line
	Graph rational numbers	Placing rational numbers on the number line
		Graphing rational numbers on the coordinate plane
	Compare rational numbers	Comparing integers
		Comparing rational numbers
	Order rational numbers	Exploring the everyday language of integers
		Statements of order: rational numbers
	Introduction to absolute value	Introducing absolute value
	Absolute value vs order	Interpreting meanings of integers in context
	Solve problems by graphing: 4 quadrants	Solving problems by graphing in the 4 quadrants
		Find the distance between 2 points, absolute value

2 Algebraic Concepts

2.1 Expressions and Equations

Outcome	Quests	Content	
CC.2.2.6.B.1 Apply and extend previous understandings of arithmetic to algebraic expressions.	Numerical expressions with exponents	Writing numerical expressions with exponents Evaluating numerical expressions with exponents	
	Write expressions: numbers & variables	Writing expressions with numbers & variables	
	Parts of an expression	Identifying parts of an expression	
	Evaluate algebraic expressions		Evaluating algebraic expressions
			Evaluating expressions using order of operations
	Properties of operations: expressions	Properties of operations: equivalent expressions	
	Equivalent expressions	Identifying equivalent expressions	
CC.2.2.6.B.2 Understand the process of solving a one-variable equation or inequality and apply it to real-world and mathematical problems.	Test solutions	Testing solutions: equations	
		Testing solutions: inequalities	
	Write algebraic expressions	Writing algebraic expressions	
	Solve 1-step equations		Preserving equality in equations
			Solving simple linear equations using models
			1-step equations: add/subtract, positive integers
			1-step equations: add/subtract, rational numbers
			1-step equations: multiply, positive integers
			1-step equations: multiply, rational numbers
			1-step equations: division, rational numbers
			Writing & solving 1-step equations
Write & represent inequalities		Writing inequalities	
		Represent algebraic inequalities on a number line	
CC.2.2.6.B.3 Represent and analyze quantitative relationships between	Independent & dependent variables	Independent & dependent variables	

dependent and independent variables.		
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3 Geometry

3.1 Geometry

Outcome	Quests	Content
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.	Area: triangles & quadrilaterals	Finding the area of a right triangle
		Investigating the area of special quadrilaterals
		Real-world area problems: special quadrilaterals
	Volume: rectangular prisms, formula	Volume: rectangular prisms, fraction edge lengths
	Polygons in the coordinate plane	Drawing polygons in the coordinate plane
	Surface area	Connecting 3-D objects with their nets
		Calculating the surface area of rectangular prisms

4 Measurement, Data, and Probability

4.1 Statistics and Probability

Outcome	Quests	Content
CC.2.4.6.B.1 Demonstrate an understanding of statistical variability by displaying, analyzing, and summarizing distributions.	Data displays	Constructing data displays
		Reading & interpreting data in a dot plot
		Reading & interpreting data in a histogram
		Reading & interpreting box plots
	Summarize numerical data	Summarizing numerical data
	Report observations	Reporting observations in a data display



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