

## Mathematics: SCOPE AND SEQUENCE (in progress)

	Kindergarten	First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth
<b>Number Concepts</b>									
<b>Place Value</b>	Rote counting to 100 Numbers to 100	Read, write, compare numbers to 100	Read, write, and compare numbers to 1,000	Read, write, and compare to 10,000	Read, write, and compare to 100,000	Read, write, and compare to 1,000,000	Apply and understand whole numbers to millions, Compare all rational numbers	Compare and order ratios and proportions involving word problems Compare inequalities Apply knowledge and skills learned in previous grades	
<b>Number Sense</b>	Count forward and backward by 1 2 digit numbers with base-10 manipulatives	Skip count by 2, 5, 10 Estimate quantities of objects Represent 3 digit numbers with base-10 manipulatives	Odd and even numbers Round to nearest ten Skip count by numbers less than ten Represent 4 digit numbers with base-10 manipulatives	Multi-digit odd and even numbers Round to nearest 100 Estimate sums and differences	Prime and Composite Estimate products Multiples and Factors	Estimate quotients, Determine greatest common factor and least common multiple	Determine greatest common factor and least common multiple		Use greatest common factor to factor polynomials, solve rational expressions to find the least common denominator
<b>Fractions, Decimals, &amp; Percent</b>	$\frac{1}{2}$ and whole	Recognize halves, thirds, fourths	Recognize and write to eighths	Recognize and write to tenths Fraction word problems Read and write decimals to hundredths	Recognize fractional parts of sets and regions Order and compare fractions Equivalent fractions and decimals Mixed numbers and improper fractions Simplest form	Recognize and generate equivalent fractions, decimals, and percent, compare percent to fractions and decimals	Apply and understand fractions and decimals to the hundred-thousandths Use fractions, decimals, and percent to solve problems	Find the percent of change, solve percent equations Understand consumer math	Find the percent of change, solve percent equations Understand consumer math
<b>Operations</b>	Add and subtract (with manipulatives) Addition and subtraction strategies	3 addends without regrouping Double-digit addition and subtraction without regrouping using various strategies	Double-digit addition and subtraction with regrouping	Multi-Digit addition and subtraction with regrouping Single-digit multiplication and division Adding and subtracting fractions with like denominators Adding and subtracting decimals to hundredths	Two-by-two digit multiplication and related division facts Long division Add and subtract decimals and fractions	Divide fractions and mixed numbers Multiply mixed numbers Multiply and divide decimals	Rational numbers and integers Apply knowledge and skills learned in previous grades	Square roots to the nearest whole number Apply knowledge and skills learned in previous grades	
<b>Properties</b>	Adding 0 and 1	Model and write fact families of addition	Turn around facts	Properties of addition and multiplication					
<b>Math Facts</b>	Addition facts up to 6+6 Subtraction facts up to 12-6	Practice addition facts up to 10+10 Practice subtraction facts up to 20-10	Addition facts up to 10+10 Subtraction facts up to 20-10	Multiplication up to 12 x 12	Division facts up to 144 ÷ 12				
<b>Algebraic Relationships</b>									
<b>Patterns</b>	Two-step patterns	Name three-step patterns	Recognize number patterns (functions)	Input/output tables with addition and subtraction	Input/output tables with multiplication and basic division	Complete function tables	Arithmetic sequences	Arithmetic sequences	

<b>Symbols</b>	Tally marks up to 20	Addition, subtraction, equal signs	Greater and less than signs	Multiplication sign	Division sign	Variables Letters or symbols in expressions and number sentences	Symbolic algebra Variable expressions Square roots and Exponents	Symbolic algebra	Symbolic algebra
<b>Models/Properties</b>	Use a number line (up to 20) to add and subtract Fill in 50 grid 10 frame Counters for 1:1 correspondence	Use a number line to add and subtract Fill in 100 grid 10 frame for addition	Model and write fact families of addition and subtraction	Commutative, associative, identity properties of addition Model multiplication sentences, word problems, and missing factors	Commutative, associative, distributive, zero, identity properties of multiplication Model problems using graphs, tables, and number sentences	Model and draw conclusions using graphs, tables, or number sentences, interpret charts to find mean, median, mode, range	Solve problems using graphs, tables, expressions, and linear equations	Solve linear equations Solve problems using graphs, tables, and expressions	Solve problems that involve quadratic equations
<b>Analyze Change</b>	More, less or equal	Compare numbers by using fewer/less, equal, more/greater	Describe qualitative and quantitative changes	Describe how change in one variable relates to change in a second variable.	Identify and describe situations with constant/varying rates of change	Construct and analyze constant or varying rates of change	Construct and analyze constant or varying rates of change	Analyze change of slope and intercept in linear relationships	Approximate and interpret rates of change from graphical & numerical data
<b>Geometric and Spatial Relationships</b>									
<b>2-D/3-D Shapes</b>	2-D and 3-D shapes using models Shapes in their environment	Name and describe 2-D & 3-D shapes Use models to compose shapes	Describe attributes and parts of 2-D and 3-D shapes	Use attributes to predict that results of putting together/taking apart 2-D and 3-D shapes	Identify, compare, analyze attributes of 2-D and 3-D shapes and develop vocabulary to describe attributes	Predict and justify the results of subdividing, combining, and transforming shapes Identify similar and congruent shapes Describe relationships between corresponding sides	Describe relationships between corresponding angles and corresponding perimeters	Identify the 2-D cross-section of 3-D shapes Describes relationships between 2-D objects and 3-D objects using properties Analyze congruent figures by side lengths and angle measures Use Pythagorean Theorem	Find lengths and measures of bisected lines/angles Find perimeter, area, and volume involving changes in scale
<b>Location &amp; Spatial Relationships</b>	Above, below, front, behind	Identify relative position using left and right	Identify relative location including direction and distance Plot positive ordered pairs using over and up	Describe location and movement using geometric vocabulary Graph positive ordered pairs	Interpret direction and distances in navigating space Plot positive and negative pairs on the coordinate plane	Use coordinate system to specify locations and find distance between points along vertical and horizontal lines	Use coordinate systems to construct geometric shapes	Use coordinate geometry to construct and identify geometric shapes in the coordinate plane using properties	Use coordinate geometry to analyze properties of right triangles and quadrilaterals including the use of Pythagorean Theorem
<b>Transformations &amp; Symmetry</b>	Equal parts	Recognize shapes that have symmetry Draw lines of symmetry	Use symmetry to analyze mathematical situations, Recognize and apply slides, flips, and turns	Identify symmetry in polygons Predict and describe the results of sliding, flipping, and turning	Create a figure with multiple lines of symmetry	Identify rotational symmetry Predict, draw and describe the results of reflection, rotation, translation around a center point	Create polygons with rotational symmetry, Describe the transformations from a given pre-image using the terms reflection, rotation, and translation, Describe the relationship between the scale factor and the perimeter of the image using dilation	Reposition shapes under formal transformations Describe the relationship between the scale factor and the area of the image using a dilation-involving stretching and shrinking Identify the number of rotational symmetries of regular polygons	Understand and represent translations, reflections, rotations, and dilations of objects in the plane by using sketches, coordinates, vectors, function notation, and matrices
<b>Spatial Reasoning</b>					Use visualization, spatial reasoning, and geometric	Use visualization, spatial reasoning, and geometric	Draw or use visual models to represent and solve problems	Draw or use visual models to represent and solve problems	Draw or use visual models to represent and solve problems

					modeling to solve problems	modeling to solve problems			
<b>Measurement</b>									
<b>Measurement</b>	Compare and order objects according to size	Select the appropriate tool for the attribute being measured (size, temperature, weight, and length)	Select the appropriate tool for the attribute being measured Measure to the nearest inch, centimeter, degree, hour, and pound	Identify, justify, and use appropriate units of measure (linear, time, weight)	Identify and justify the unit of linear measure (including perimeter) in standard and metric units Identify equivalent linear measures within a system of measurement	Identify and justify the unit of measure for area (customary and metric) Identify equivalent capacities within a system of measurement	Identify and justify the unit of measure for area and volume (customary and metric)	Identify and justify the unit of measure for volume (customary and metric) Identify the equivalent area and volume measures within a system of measurement	Apply knowledge and skills learned in previous grades
<b>Time</b>	Passage of time & time of everyday events Identify time to the nearest hour and introduce half hour	Tell time to the nearest hour, half hour, and introduce quarter hour	Tell time to the quarter hour and 5-minute intervals	Measure to the minute	Determine elapsed time			Apply the distance formula	Apply the distance formula
<b>Money</b>	Penny, nickel, dime, quarter	Count combinations of pennies, nickels, dimes, and quarters, make trades between coins	Count back change for a purchase up to one dollar	Determine change for a purchase up to five dollars Add and subtract money values up to five dollars	Determine change for a purchase up to ten dollars Add and subtract money values up to ten dollars		Find discount, mark-up, sales tax Determine simple and compound interest		
<b>Tools &amp; Formulas</b>	Standard and nonstandard tools to measure	Make reasonable estimates for the measurement of everyday objects	Measure to the nearest centimeter, inch, and half inch Determine perimeter of polygons	Measure to the nearest quarter inch Determine the perimeter and area of polygons	Measure to the nearest eighth inch Determine area of polygons and non-polygons Find surface area of cubes Identify and justify an angle as acute, obtuse, right, or straight	Find volume Convert from one unit to another within a system of linear measurement (customary and metric) Find missing angles in triangles and quadrilaterals	Solve problems involving the area and perimeter of polygons Convert from one unit to another within a system of measurement (mass and weight) Find circumference and area of a circle Find surface area and volume of rectangular prisms, triangular prisms, and cylinders	Find length and measures of bisects, lines and angles Convert from one unit to another within a system of measurement, Convert square or cubic units within the same system of measurement	Solve problems of angle measure, including those involving triangles and parallel lines cut by a transversal, use sine, cosine, tangent
<b>Data &amp; Probability</b>									
<b>Data Collection, Organization &amp; Display</b>	Sort items according to their attributes Create graphs using physical objects	Pose questions and gather data Sort and classify items according to attributes Interpret data using tables and graphs	Pose questions and gather data Sort and classify items according to attributes Use a legend or key to represent one-to-many correspondence using pictures and graphs	Collect data using observations, surveys, and experiments Represent data using graphs and tables	Collect data using observations, surveys, and experiments Create tables or graphs to represent categorical and numerical data	Evaluate data collection methods Describe methods to collect, organize, and represent categorical and numerical data	Formulate questions, design studies, and collect data about characteristics Interpret circle graphs and stem-and-leaf plots	Select, create and use appropriate graphical representation of data, including circle graphs, histograms, box and whisker plots	Select, create and use appropriate graphical representation of data, including scatter plots and weighted averages

<b>Analyze Data</b>	Does not apply	Does not apply	Introduce the concept of describing events as likely and unlikely,	Describe events as likely and unlikely, predict outcomes of simple experiments , find median, mode, and range of data sets	Describe chances of events as highly unlikely, unlikely, even, certain, likely, highly likely, etc., Select appropriate statistical methods to analyze data (mean, median, mode, and range)	Compare related data sets, determine probability and odds	Find a range and measures of center including mean, median, and mode	Find, use, and interpret measures of center, outliers, and spread, including range and interquartile range, apply knowledge and skills learned in previous grades	Find, use, and interpret measures of center, outliers and spread, including range and interquartile range Compare different representations of the same data Apply knowledge and skills learned in previous grades
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