Grade by Grade Mathematics Content Standards
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1.0 Knowledge of Algebra, Patterns, or Functions – Students will algebraically represent, model, analyze, or solve mathematical or real-world problems involving patterns or functional relationships.

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
A. Patterns or Functions 1. identify, describe, extend, or create numeric patterns to: a. represent or analyze numeric patterns using skip counting by 2, 5, 10, or 100 starting with any whole number (0-1000) b. represent or analyze numeric patterns using skip counting by 3 or 4 starting with 0,1,2,3 or 4 (0-100) c. represent or analyze numeric patterns using skip counting backward by 10 or 100 starting with any whole number (0-1000) 2. identify, describe, extend, or create non-numeric patterns to: a. represent or analyze growing patterns using symbols, shapes, designs, or pictures starting at the beginning and showing at least 3 levels but no more than 5 and asking for the next level b. represent or analyze repeating patterns using symbols, shapes, designs, or pictures with no more than 4 objects in the core of the pattern	A. Patterns or Functions 1. identify, describe, extend, or create numeric patterns or functions to: a. represent or analyze numeric patterns using skip counting by 3,4,6,7,8, or 9 starting with any whole number (0-100) b. complete a function table using a given rule with one operation (+,-, x, ÷ with no remainders) using whole numbers (0-50) 2. identify, describe, extend, analyze, or create a non-numeric growing or repeating pattern to: a. generalize a rule for the next level of a non-numeric growing pattern given at least 3 levels but no more than 5 levels b. generalize a rule for the pattern with no more than 4 objects in the core pattern	A. Patterns or Functions 1. identify, describe, extend, or create numeric patterns or functions to: a. interpret or write the rule for a one-operation (+,-, x, ÷ with no remainders) function table using whole numbers or decimals with no more than 2 decimal places (0-1000) b. complete a function table with a one-operation (+,-, x, ÷ with no remainders) rule with using whole numbers or decimals with no more than two decimal places (0-200) c. apply a given two-operation rule (+,-,x) for a pattern using whole numbers (0-100)	A. Patterns or Functions 1. identify, describe, extend, or create numeric patterns or functions to: a. interpret or write the rule for a one-operation (+,-, x, ÷) function table using whole numbers or decimals with no more than two decimal places (0-10,000) b. complete a function table using a given two-operations (+,-,x) rule using whole numbers no more than 10 in the rule (0-50)	A. Patterns or Functions 1. identify, describe, extend, or create linear patterns or functions to: a. complete a function table using a given rule with two-operations (+, -, x) using whole numbers no more than 20 in the rule (0-500)	A. Patterns or Functions 1. identify, describe, extend, or create patterns, functions or sequences to: a. determine the n^{th} term no more than 10 terms beyond the last given term using the recursive relationship of arithmetic sequences with common differences no more than 10 (-100 to 5000) b. determine the n^{th} term no more than 5 terms beyond the last given term using the recursive relationship of geometric sequences with a common ratio of whole numbers no more than 5 (0-10,000) c. determine whether functions are linear or nonlinear, given the graph

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1.0 Knowledge of Algebra, Patterns, or Functions Continued

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
B. Expressions, Equations or Inequalities 1. write or identify expressions to: a. represent numeric quantities using operational symbols (+,-) using whole numbers (0-50)	B. Expressions, Equations or Inequalities 1. write or identify expressions to: a. represent numeric quantities using operational symbols (+,-, x, ÷ with no remainders) using whole numbers (0-100) b. determine equivalent numeric expressions using whole numbers (0-100)	B. Expressions, Equations or Inequalities 1. write or evaluate expressions to: a. represent unknown quantities with one unknown and one-operation (+,-, x, ÷ with no remainders) using whole numbers (0-100) or money ($0- $100) b. determine the value of algebraic expressions with one unknown and one-operation (+,-) with whole numbers (0-1000) c. determine the value of algebraic expressions with one unknown and one-operation (×, ÷ with no remainders) and a replacement set of whole numbers no more than 9 (0-100)	B. Expressions, Equations or Inequalities 1. write or evaluate expressions to: a. represent unknown quantities with one unknown and one-operation (+,-) using whole numbers (0-200), fractions with denominators as factors of 24 (0-50), or decimals with no more than two decimal places (0-50) b. determine the value of algebraic expressions with one unknown and one-operation (+,-) using whole numbers (0-200), fractions with denominators as factors of 24 (0-50), or decimals with no more than two decimal places (0-50) c. determine the value of numeric expressions using order of operations (+,-, x, ÷ with no remainders) with no more than 4 operations and 1 set of grouping symbols using parentheses or a division bar with whole numbers (0-100)	B. Expressions, Equations or Inequalities 1. write or evaluate expressions to: a. represent unknown quantities with one unknown and one or two-operations (+,-, x, ÷ with no remainders) using whole numbers (0-20), fractions with denominators as factors of 100 (0-20), or decimals with no more than three decimal places (0-20) b. determine the value of algebraic expressions with one unknown and no more than two operations (+,-, x, ÷ with no remainders) using whole numbers (0-200), fractions with denominators as factors of 100 (0-100), or decimals with no more than three decimal places (0-100) c. determine the value of numeric expressions using order of operations with no more than 4 operations (+,-, x, ÷ with no remainders) and 1 set of grouping symbols using parentheses, brackets, or a division bar using whole numbers (0-200), fractions with denominators as factors of 100 (0-100), or decimals with no more than three decimal places (0-100) 2. identify, write, or solve equations or inequalities to: a. represent relationships using a variable using the appropriate relational symbols (>, <, =) and one or two operational symbols (+,-, ×, ÷) using whole numbers (0-20), fractions with denominators as factors of 100 (0-20) or decimals with no more than three decimal places (0-20) b. find the unknown (used only once) in an equation with one or two operations (+,-, ×) using whole numbers (0-500), fractions with denominators as factors of 100 (0-50), or decimals with no more than three decimal places (0-100) c. find the unknown in an inequality with one variable with a positive whole number coefficient with one operation (+,-, ×, ÷ with no remainders) using whole numbers or decimals with no more than 2 decimal places (0-100) d. identify or graph solutions of inequalities on a number line using whole numbers (0-50) e. apply given formulas having no more than three variables and up to two operations using whole	B. Expressions, Equations or Inequalities 1. write, simplify or evaluate expressions to: a. represent unknown quantities with one unknown and no more than 3 operations using rational numbers (-1000 to 1000) b. determine the value of algebraic expressions with one or two unknowns and up to three operations using rational numbers (-100 to 100) c. determine the value of numeric expressions using order of operations with no more than 5 operations including exponents of no more than 3 and 2 sets of grouping symbols using parentheses, brackets, a division bar, or absolute value with rational numbers (-100 to 100) d. represent equivalent algebraic expressions by combining like terms with no more than 3 variables using whole numbers (-50 to 50) or proper fractions with denominators as factors of 20 (-20 to 20)
2. identify, write, or solve equations or inequalities to: a. represent relationships by using the appropriate relational symbols (>, <, =) and operational symbols (+,-) using whole numbers (0-1000) b. find the missing number (unknown) in a number sentence (equation) with one-operation (+,-) using whole numbers (0-100)	2. identify, write, or solve equations or inequalities to: a. represent relationships by using the appropriate relational symbols (>, <, =) and operational symbols (+,-, ×) using whole numbers (0-200) b. find the unknown in an equation with one operation (×) using whole numbers (0-100)	2. identify, write, or solve equations or inequalities to: a. represent relationships by using the appropriate relational symbols (>, <, =) and one operational symbol (+,-, ×, ÷ with no remainders) using whole numbers (0-400) b. find the unknown in an equation with one operation (+,-, ×, ÷ with no remainders) using whole numbers (0-2000)	2. identify, write, or solve equations or inequalities to: a. represent relationships using a variable with the appropriate relational symbols (>, <, =) and one operational symbol (+,-, ×, ÷) using fractions with denominators as factors of 24 (0-50), or decimals with no more than two decimal places (0-50) b. find the unknown in an equation with one operation (+,-, ×, ÷ with no remainders) using decimals with no more than two decimal places (0-100)		2. identify, write, or solve equations or inequalities to: a. represent relationships using a variable by using the appropriate relational symbols (>, <, =) and no more than 3 operational symbols (+,-, ×, ÷) using rational numbers (-1000 to 1000) b. find the unknown in an equation with one unknown on one side used no more than 3 times and up to three operations (same or different but only one division) using rational numbers (-2000 to 2000) c. find the unknown in an inequality with one variable on one side used no more than 3 times whose result after combing coefficients is a positive whole number coefficient and one or

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				numbers (0-100), fractions with denominators as factors of 100 (0-100), or decimals with no more than three decimal places (0-100)	two operations (-100 to 100) d. identify or graph solutions of inequalities with one variable used once and a positive whole number coefficient on a number line using integers (-100 to 100) e. identify equivalent equations f. apply given formulas having no more than four variables and up to three operations using rational numbers (-500 to 500)

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1.0 Knowledge of Algebra, Patterns, or Functions Continued

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8

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C. Numeric or Graphic Representations of Relationships 1. locate points to: a. represent whole numbers on a number line (0-500) b. represent proper fractions with denominators of 2, 3, or 4 on a number line	C. Numeric or Graphic Representations of Relationships 1. locate points to: a. represent proper fractions with denominators of 6, 8, or 10 on a number line b. identify positions on a coordinate plane in the first quadrant using whole numbers (0-20)	C. Numeric or Graphic Representations of Relationships 1. locate points to: a. represent decimals with no more than two decimal places (0-100) or mixed numbers (0-10) with denominators of 2,3,4,5,6,8,10 on a number line b. create a graph in the first quadrant of a coordinate plane using ordered pairs of whole numbers (0-50)	C. Numeric or Graphic Representations of Relationships 1. locate points to: a. represent integers (-20 to 20) on a number line b. create a graph in the coordinate plane using no more than 4 ordered pairs of integers (-20 to 20) or no more than 5 ordered pairs with fractions/mixed numbers with denominators of 2 (-10 to 10) 2. analyze linear relationships to: a. identify a graph that shows increase, decrease, or no change	C. Numeric or Graphic Representations of Relationships 1. locate points to: a. represent rational numbers on a number line (-100 to 100) b. create a graph in the coordinate plane using no more than 8 ordered pairs of rational numbers (-20 to 20) 2. analyze linear relationships to: a. identify a table of values that shows increase, decrease, or no change	C. Numeric or Graphic Representations of Relationships 1. locate points to: a. create a graph in the coordinate plane of a linear equation with two unknowns having integer coefficients (-9 to 9) and integer constants (-20 to 20) 2. analyze linear relationships to: a. determine the slope of the graph of a linear relationship having integer coefficients (-9 to 9) and integer constants (-20 to 20) given its graph

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2.0 Knowledge of Geometry – Students will apply the properties of one-, two, or three-dimensional geometric figures to describe, reason, or solve problems about shape, size, position, or motion of objects.

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
A. Properties of Plane Geometric Figures 1. analyze the properties of plane geometric figures to: a. identify or describe polygons including triangles, quadrilaterals, pentagons, hexagons or octagons by the number of sides or vertices b. identify or describe quadrilaterals by the length of sides c. identify triangles, rectangles, or squares as part of a composite figure comprised of 2 of the stated polygons	A. Properties of Plane Geometric Figures 1. analyze the properties of plane geometric figures to: a. identify or describe acute, right, or obtuse angles 2. analyze geometric relationships to: a. compare or classify angles as acute, right, or obtuse	A. Properties of Plane Geometric Figures 1. analyze the properties of plane geometric figures to: a. identify or describe parallel or perpendicular lines or line segments in geometric figures or pictures b. identify a polygon with no more than 8 sides as part of a composite figure comprised of triangles or quadrilaterals 2. analyze geometric relationships to: a. compare or classify quadrilaterals including squares, rectangles, rhombi, parallelograms, or trapezoids by sides or angles	A. Properties of Plane Geometric Figures 1. analyze the properties of plane geometric figures to: a. identify or describe diagonal lines or line segments b. identify or describe the relationship of radius or diameter to a circle 2. analyze geometric relationships to: a. compare or classify triangles as scalene, equilateral or isosceles b. compare or classify triangles as equiangular, obtuse, acute, or right c. apply the concept of the sum of angles in any triangle is 180° d. identify or compare attributes (circumference, radii, or diameter) of a circle (ð = 3.14)	A. Properties of Plane Geometric Figures 1. analyze the properties of plane geometric figures to: a. identify or describe vertical, adjacent, complementary, or supplementary angles 2. analyze geometric relationships to: a. determine missing measurements of an angle in a quadrilateral b. determine missing measurements of vertical, adjacent, complementary, or supplementary angles	A. Properties of Plane Geometric Figures 1. analyze the properties of plane geometric figures to: a. identify or describe the geometric relationships of alternate interior, alternate exterior, or corresponding angles formed by parallel lines cut by a transversal b. identify or describe the hypotenuse or legs of right triangles 2. analyze geometric relationships to: a. determine the missing measurements of alternate interior, alternate exterior or corresponding angles formed by parallel lines cut by a transversal b. apply the Pythagorean Theorem
B. Properties of solid geometric figures 1. analyze the properties of solid geometric figures to: a. identify or describe cube by the number of edges, faces, vertices, or shape of each face	B. Properties of solid geometric figures 1. analyze the properties of solid geometric figures to: a. identify cones or cylinders b. describe triangular pyramids, rectangular pyramids, triangular prisms or rectangular prisms by the number of edges, faces, or vertices 2. analyze the relationship between plane geometric figures and faces of solid geometric figures to: a. compare squares to cubes b. compare triangles/ rectangles to triangular pyramids/rectangular pyramids	B. Properties of solid geometric figures 1. analyze the properties of solid geometric figures to: a. identify or classify pyramids or prisms as triangular pyramids, rectangular pyramids, triangular prisms or rectangular prisms by the number of edges, faces or vertices b. classify prisms or pyramids as triangular or rectangular by the base 2. analyze the relationship between plane geometric figures and surfaces of solid geometric figures to: a. compare rectangles to rectangular prisms b. compare triangles/rectangles to triangular prisms c. compare circles/rectangles to cylinders			

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2.0 Knowledge of Geometry Continued

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
		C. Representation of Geometric Figures 1. represent plane geometric figures to: a. identify, describe or draw angles, parallel line segments or perpendicular line segments given their dimensions using whole numbers (0-20) or angle measurements (0^0 – 179^0)	C. Representation of Geometric Figures 1. represent plane geometric figures to: a. draw triangles given their dimensions or angle measurements b. identify, describe or draw a polygon in the first quadrant given no more than six coordinates c. identify or describe perpendicular bisectors or angle bisectors	C. Representation of Geometric Figures 1. represent plane geometric figures to: a. construct a circle given the radius or diameter as a whole number using inches or centimeters b. construct a line segment congruent to a given line segment c. construct a perpendicular bisector to a given line segment or to a given angle bisector	C. Representation of Geometric Figures 1. represent plane geometric figures to: a. draw quadrilaterals given their whole number dimensions in inches or centimeters or angle measurements b. construct a perpendicular through a given point on a given line segment c. construct a triangle congruent to a given triangle
D. Congruence and Similarity 1. analyze congruent figures to: a. identify or describe geometric figures with the same shape and same size		D. Congruence and Similarity 1. analyze similar figures to: a. identify or describe geometric figures with the same shape and different size		D. Congruence and Similarity 1. apply the properties of congruent polygons to: a. find the length of corresponding sides or the measure of corresponding angles using whole numbers (0-1000)	D. Congruence and Similarity 1. apply the properties of similar polygons to: a. find the length of corresponding sides or the measure of corresponding angles using rational numbers with no more than 2 decimal places (0-1000)
E. Using Transformations 1. analyze a transformation to: a. identify or describe the results of a slide (horizontal), flip (over a vertical line), or turn (90^0 clockwise) of a geometric figure or picture 2. analyze geometric figures or pictures to: a. identify or describe not more than 4 lines of symmetry	E. Using Transformations 1. analyze a transformation to: a. identify or describe the given result of a translation (horizontal), reflection (over a vertical line), or rotation (90^0 clockwise) of geometric figure or picture	E. Using Transformations 1. analyze a transformation to: a. identify or describe the given result of a translation (vertical), a reflection (over a horizontal line), or a rotation (90° or 180° around a given point) of a geometric figure or picture		E. Using transformations 1. analyze a transformation on a coordinate plane to: a. identify or plot the result of one translation (horizontal or vertical), reflection (horizontal or vertical) , or rotation (90° or 180°)	E. Using transformations 1. analyze a transformation on a coordinate plane to: a. identify or plot the result of two transformations using translations (horizontal or vertical), reflections (horizontal or vertical), or rotations (90° or 180°)

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3.0 Knowledge of Measurement – Students will identify attributes, units, or systems of measurements or apply a variety of techniques, formulas, tools or technology for determining measurements.

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
A. Measurement Scales 1. read scales to: a. estimate or determine length to the nearest centimeter or ½ inch b. identify time to the nearest minute using an analog clock c. estimate or determine temperature to the nearest degree (^{0}F or ^{0}C) d. estimate or determine weight to the nearest pound or ounce	A. Measurement Scales 1. read scales to: a. estimate or determine length to the nearest nearest centimeter or ¼ inch	A. Measurement Scales 1. read scales to: a. estimate or determine weight to the nearest ounce or gram b. estimate or determine capacity to the nearest ounce			
B. Measurement Tools 1. use standard or metric units to: a. measure length to the nearest ½ inch or centimeter using a ruler	B. . Measurement Tools 1. use standard or metric units to: a. measure length to the nearest millimeter or ¼ inch using a ruler	B. . Measurement Tools 1. use standard or metric units to: a. measure length to the nearest 1/8 inch using a ruler 2. use standard units to: b. measure angles to the nearest degree using protractors	B. Measurement Tools 1. use standard units to: a. measure length to the nearest 1/16 inch using a ruler		
C. Applications in Measurement 1. apply measurements concepts to: a. estimate or find the perimeter of geometric figures or pictures on a grid (0-50) b. estimate or find the area of geometric figures or pictures on a grid (0-50) c. estimate or find the volume of rectangular prisms (0-20) 2. calculate to: a. determine equivalent units of 12 inches = 1 foot or 3 feet = 1 yard (0-100)	C. Applications in Measurement 1. count or calculate to: a. find the perimeter of polygons with no more than 6 sides given the length of the sides in whole numbers (0-100) b. find the area of rectangles given the length of the sides in whole numbers (0-100) c. find elapsed or end time using hour and half hour intervals 2. calculate to: a. determine equivalent units of 36 inches = 1 yard (0-100)	C. Applications in Measurement 1. estimate or apply formulas to: a. determine the perimeter of polygons with no more than 8 sides using whole number (0-500) b. determine the area of rectangles with whole number (0-200) c. find the area or perimeter of any closed figure drawn on a grid (0-50) 2. calculate to: a. find start, elapsed or end time to the nearest minute b. determine equivalent units of seconds, minutes, or hours c. determine equivalent units of pints, quarts or gallons	C. Applications in Measurement 1. estimate or apply formulas to: a. determine the area of a triangle with whole number dimensions (0-200) b. determine the volume of rectangular prisms with whole number dimensions (0-1000) c. determine the area of composite figures using no more than four polygons (triangles or rectangles) with whole number dimensions (0-200) d. determine the missing measure of a quadrilateral given the perimeter using whole number dimensions (0-200) e. determine the missing measure of a square or rectangle given the area using whole number dimensions (0-200)	C. Applications in Measurement 1. estimate or apply formulas to: a. determine area of parallelograms or trapezoids using whole number dimensions (0-1000) b. determine surface area of rectangular prisms using whole number dimensions (0-1000) 2. analyze scale drawings to: a. determine a missing unit of length for a polygon with no more than 8 sides using whole numbers (0-1000) b. determine the distance between 2 points using a drawing and a scale of 1 cm = ? , ¼ inch = ?, ½ inch = ?, or ¾ inch = ? (0-1000)	C. Applications in Measurement 1. estimate or apply formulas to: a. find the circumference or area of a circle using rational numbers with no more than 2 decimal places (0-10,000) b. find the area of a composite figure with no more than 6 polygons (triangles, rectangles, or circles) by measuring, partitioning, or using formulas with whole number dimensions (0-10,000) c. find the volume of a cylinder with whole number dimensions (0-10,000) 2. analyze measurement relationships to: a. solve problems using proportions, scale drawings with scales as whole numbers, or rates using whole numbers or decimals (0-1000)

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4.0 Knowledge of Statistics – Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
A. Data Displays 1. organize or display data to: a. make tables with no more than 4 categories and 1 set of data using whole numbers (0-1000) b. make pictographs with scales of 2:1, 4:1 or 10:1 using whole numbers(0-100) c. make single bar graphs with no more than 4 categories using intervals of 1, 2, 5 or 10 using whole numbers (0-100)	A. Data Displays 1. organize or display data to: a. make line plots with no more than 20 pieces of data with a range of no more than 10 using whole numbers (0-100)	A. Data Displays 1. organize or display data to: a. make stem/leaf plots with no more than 20 data points using whole numbers (0-100) b. make line plots with no more than 20 pieces of data with a range of no more than 20 using whole numbers (0-200) c. make double bar graphs with no more than 4 categories and intervals of 1, 2, 5 or 10 using whole numbers (0-100) d. make line graphs with y-axis having intervals of 1, 2, 4, 5 or 10 and x-axis with no more than 10 time intervals using whole numbers (0-100)	A. Data Displays 1. organize or display data to: a. make frequency tables with no more than 5 categories or ranges of numbers and frequencies of no more than 25 b. make stem & leaf plots with no more than 20 data points using whole numbers (0-1000)	A. Data Displays 1. organize and display data to: a. make back to back stem/leaf plots with no more than 20 data points using whole numbers (0-100)	A. Data Displays 1. organize and display data to: a. make circle graphs with no more than 5 categories using data in whole number percents b. make box/whisker plots with no more than 12 pieces data using whole numbers (0-1000) c. make scatter plots with no more than 10 points using whole numbers (0-1000)
B. Data Analysis 1. analyze data to: a. interpret tables with no more than 4 categories and 1 set of data using whole numbers (0-1000) b. interpret pictographs with scales of 2:1, 4:1 or 10:1 using whole numbers (0-100) c. interpret single bar graphs with maximum of 4 bars with intervals of 1, 2, 5 or 10 using whole numbers (0-100)	B. Data Analysis 1. analyze data to: a. interpret line plots with no more than 20 pieces of data with a range no more than 10 using whole numbers (0-100) b. interpret line graphs with the x-axis representing no more than 6 time intervals, the y-axis consisting of no more than 10 intervals with scales as factors of 100 using whole numbers (0-100) 2. determine measures of central tendency to: a. find the range, median, or mode of a given data set with no more than 8 pieces of data using whole numbers (0-100)	B. Data Analysis 1. analyze data to: a. interpret stem & leaf plots with no more than 20 pieces of data points using whole numbers (0-100) b. interpret line plots with no more than 20 pieces of data with a range of no more than 20 using whole numbers (0-100) c. interpret double bar graphs with no more than 4 categories using whole numbers (0-1000) d. interpret double line graphs with y-axis having intervals of 1, 2, 5 or 10 and x-axis having no more than 10 time intervals using whole numbers (0-100) e. read circle graphs with no more than 4 categories and data in whole numbers or percents which are multiples of 5 (0-100) 2. determine measures of central tendency to: a. find the mean (no remainders) of a given data set with no more than 8 pieces of data using whole numbers (0-1000)	B. Data Analysis 1. analyze data to: a. interpret frequency tables with no more than 5 categories or ranges of numbers and frequencies of no more than 25 b. read circle graphs with no more than 5 categories using data in whole numbers or percents (0-1000)	B. Data Analysis 1. analyze data to: a. recognize misuse of data by identifying whether the choice of graphical display, scale, or sample population leads to faulty interpretation or representation of data 2. analyze measures of central tendency to: a. determine which measure of central tendency is the best representation of no more than 10 pieces of data using whole numbers or decimals with no more than 2 decimal places (0-100)	B. Data Analysis 1. analyze data to: a. interpret tables with no more than 5 categories having no more than 2 quantities per category using whole numbers or decimals with no more than 2 decimal places (0-100) b. interpret box/whisker plots using minimum, first (lower) quartile, median (middle quartile), third (upper) quartile, or maximum using whole numbers (0-100) c. interpret scatter plots with no more than 10 points using whole numbers or decimals with no more than 2 decimal places (0-100) d. interpret circle graphs with no more than 8 categories (0-1000)

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5.0 Knowledge of Probability – Students will use experimental methods or theoretical reasoning to determine probabilities to make predictions or solve problems about events whose outcomes involve random variation.

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
		A. Sample Space 1. identify members of a sample space to: a. determine all possible outcomes of two independent events with no more than 4 outcomes each, using an organized list or tree diagram		A. Sample Space 1. identify number of members of a sample space to: a. determine the number of outcomes for no more than 3 independent events with a sample space of no more than 6 outcomes in each event	A. Sample Space 1. identify number of members of a sample space to: a. determine the number of outcomes for no more than 5 dependent events with no more than 10 outcomes in the first event
B. Theoretical Probability 1. determine the relative probability of one simple event to: a. describe the probability using the terms more (or most) likely, less (or least) likely, or equally likely	B. Theoretical Probability 1. determine the probability of one simple event comprised of equally likely outcomes to: a. express the probability as a fraction with a sample space of no more than 6 outcomes	B. Theoretical Probability 1. determine the probability of one simple event comprised of equally likely outcomes to: a. express the probability as a fraction with a sample space of no more than 20 outcomes	B. Theoretical Probability 1. determine the probability of one simple event comprised of equally likely outcomes to: a. express the probability as a decimal with a sample space of 10, 20, 25, or 50 outcomes	B. Theoretical Probability 1. determine the probability of an event comprised of no more than 2 independent events to: a. express the probability as a fraction, decimal with no more than 2 decimal places, or percent with a sample space of no more than 35 outcomes	B. Theoretical Probability 1. determine the probability of an event comprised of no more than 2 independent events to: a. express the probability as a fraction, decimal, or percent with a sample space of no more than 36-60 outcomes 2. determine the probability of second event that is dependent on a first event of equally likely outcomes to: a. express the probability as a fraction, decimal, or percent with a sample space of no more than 60 outcomes
			C. Experimental Probability 1. analyze the results of a probability experiment with no more than 30 results to: a. make predictions and express the experimental probability as a fraction, decimal, or percent	C. Experimental Probability 1. analyze the results of a survey or simulation with 25 or 50 results to: a. make predictions and express the probability as a fraction, decimal with no more than 2 decimal places, or percent	C. Experimental Probability 1. analyze the results of a survey or simulation with 20 - 500 results to: a. make predictions and express the probability as a fraction, decimal with no more than 2 decimal places, or percent

Outcome is defined as each of the possible results of an experiment
A **sample space** is the set of all possible outcomes of an experiment
Event is defined as a subset of a samples space.

Example of an Experiment - Rolling a die

Outcome – 1 or 2 or 3 or 4 or 5 or 6
Sample space – 1,2,3,4,5,6
Event of even number – 2,4,6

Independent events are defined as two or more events in which the outcome of one has no effect on the other. For example : Rolling a die and then spinning a spinner or selecting a marble, replacing the marble and selecting again.
Dependent events are defined as two or more events in which the outcome of one has an effect on the outcome of the other. For example: Selecting a marble from a bag, do not replace it and then select another marble from the bag or picking one sock from a drawer, do not replace it and then select another sock from the drawer.

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Grade by Grade Mathematics Content Standards
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6.0 Knowledge of Number Relationships or Computation – Students will describe, represent, or apply numbers or their relationships or will estimate or compute using mental strategies, paper/pencil or technology.

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
A. Knowledge of Number and Place Value 1. apply knowledge of whole numbers or place value to: a. read, write, or represent whole numbers using symbols, words, or models (0-10,000) b. express whole numbers in expanded form (0-10,000) c. identify the place value of a digit in a number (0-9,999) d. compare, order, or describe no more than 4 whole numbers with or without using the symbols (<, > or =) (0-10,000) 2. apply knowledge of fractions to: a. read, write, or represent halves, thirds, or fourths of a single region using symbols, words, or models b. read, write, or represent halves, thirds, or fourths of a set which has the same number of items as the denominator using symbols, words, or models 3. apply knowledge of money to: a. represent money amounts ($0-$100) b. determine the value of a given set of mixed currency up ($0-$100)	A. Knowledge of Number and Place Value 1. apply knowledge of whole numbers or place value to: a. read, write, or represent whole numbers using symbols, words, or models (0-1,000,000) b. express whole numbers in expanded form (0-1,000,000) c. identify the place value of a digit in a number (0-1,000,000) d. compare or order no more than 4 whole numbers with or without using the symbols (<, > or =) (0-1,000,000) 2. apply knowledge of fractions, decimals, or place value to: a. read, write, or represent proper fractions in sixths, eighths, tenths of a single region using symbols, words, or models b. read, write, or represent proper fractions in sixths, eighths, tenths of a set which has the same number of items as the denominator using symbols, words, or models c. read, write, or represent decimals with no more than 2 decimal places using symbols, words or models (0-100) d. express decimals with no more than 2 decimal places in expanded form (0-100) e. compare or order no more than 3 fractions or mixed numbers with like denominators with or without using the symbols (<, > or =) (0-20) f. compare, order, or describe no more than 3 decimals with no more than 2 decimals places with or without using the symbols (<, > or =) (0-100) 3. apply knowledge of money to: a. compare the value of 2 sets of mixed currency ($0 - $100)	A. Knowledge of Number and Place Value 1. apply knowledge of fractions, decimals, or place value to: a. read, write, or represent fractions or mixed numbers with denominators as factors of 24 using symbols, words, or models (0-200) b read, write, or represent decimals with no more than 3 decimal places or percents using symbols, words, or models (0-100) c. identify or determine equivalent forms of proper fractions with denominators that are factors of 100, decimals, or percents (0-200) d. compare or order no more than 4 fractions or mixed numbers with denominators that are factors of 100 with or without using the symbols (<, > or =) (0-100) e. compare, order, or describe no more than 4 decimals with no more than 3 decimal places with or without using the symbols (<, >, or =) (0-100)	A. Knowledge of Number and Place Value 1. apply knowledge of rational numbers or place value to: a. read, write, or represent whole numbers using exponential form using powers of 10 (0-10,000) b. read, write, or represent integers (-100 to100) c. identify or determine equivalent forms of proper fractions with denominators as factors of 100, decimals, percents, or ratios (0-1000) d. compare or order no more than 4 fractions with denominators as factors of 100 with decimals with up to 2 decimal places with or without using the symbols(<,>, or =) (0-100)	A. Knowledge of Number and Place Value 1. apply knowledge of rational numbers or place value to: a. read, write, or represent whole numbers in exponential notation with bases no more than 12 and exponents no more than 3 or standard form (0-1000) b. express decimals with no more than 4 decimal places using expanded notation (0-100) c. determine equivalent forms of fractions, decimals, percents, or ratios using positive rational numbers (0-100) d. compare, order, or describe no more than 4 fractions with denominators as factors of 300 that are less than 101, decimals with no more than 4 decimal places, percents or integers with or without using the symbols(<,>, or =) (0-100)	A. Knowledge of Number and Place Value 1. apply knowledge of rational numbers or place value to: a. read, write, or represent rational numbers in exponential notation or scientific notation (-10,000 to 1,000,000,000) b. compare, order, or describe no more than 4 integers or positive rational numbers using equivalent forms or absolute value with or without using the symbols (<,>, or =) (-100 to 100)

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Grade by Grade Mathematics Content Standards
DRAFT

6.0 Knowledge of Number Relationships or Computation Continued

Grade 3	Grade 4	Grade5	Grade 6	Grade 7	Grade 8
B. Number Theory 1. apply number relationships to: a. identify or describe whole numbers as even or odd (0-100)	B. Number Theory 1. apply number relationships to: a. identify or use divisibility rules for 2, 5, or 10 with whole numbers (0-1000) b. identify the factors of whole numbers (0-24) c. identify the first 5 multiples of any single digit whole number	B. Number Theory 1. apply number relationships to: a. identify or describe whole numbers as prime or composite (0-100) b. identify or use rules of divisibility for 2, 3, 5, 9, or 10 with whole numbers (0-10,000) c. identify the greatest common factor which is no more than 10 of two whole numbers (0-100) d. identify a common multiple or the least common multiple of no more than 4 single digit whole numbers			
C. Number Computation 1. analyze number relations or compute to: a. add up to 3 addends with no more than 3 digits in each addend using whole numbers (0-1000) b. subtract a minuend and subtrahend with no more than 3 digits in each using whole numbers (0-999) c. represent multiplication or division basic facts (up to 9 x 9 = 81) using number sentences, pictures or drawings d. identify or use the commutative, identity or zero properties for multiplication using whole numbers (0-20)	C. Number Computation 1. analyze number relations or compute to: a. add up to 3 addends with no more 4 digits in each addend using whole numbers (0-10,000) b. subtract a minuend and subtrahend with no more than 4 digits in each using whole numbers (0-10,000) c. multiply a one 1-digit factor by up to a 3-digit factor using whole numbers (0-1000) d. divide up to a 3-digit dividend by a 1-digit divisor using whole numbers and no remainders (0-1000) e. add or subtract 2 proper fractions with single digit like denominators , 2 mixed numbers with single digit like denominators or a whole number and a proper fraction with a single digit denominator (0-20) f. add 2 decimals with the same number of decimal places but no more than 2 decimal places and no more than 4 digits including monetary notation (0-100) g. subtract 2 decimals with the same number of decimal places but no more than 2 decimal places and no more than 4 digits including monetary notation (0-100) 2. estimate to: a. determine the sum or difference of 2 numbers with no more than 2 decimal places in each (0-100) b. determine the product of one 1-digit factor with the other factor having no more than 2 digits or the quotient of a 1-digit divisor with the dividend having no more than 2digits using	C. Number Computation 1. analyze number relations or compute to: a. multiply a 3-digit factor by another factor with no more than 2-digit using whole numbers (0-10,000) b. divide a dividend with no more than a 4-digits dividend by a 2-digit divisor using whole numbers (0-10,000) c. interpret quotients (including remainders) with no more than a 3-digit dividend by a 1 or 2 digit divisor using whole numbers (0-1000) d. add or subtract proper fractions or mixed numbers with denominators as factors of 24 and answers in simplest form (0-20) e. add decimals, including monetary notation, with no more than 4 addends and no more than 3 decimal places in each addend (0-1000) f. subtract decimals including monetary notation with a minuend and subtrahend with no more than 3 decimal places (0-1000) g. multiply a decimal in monetary notation by a single digit whole number (0-100) 2. estimate to: a. determine sum of no more than 3 addends with no more 3 decimal places in each addend or the difference of a minuend and subtrahend with no more than 3 decimal places (0-1000) b. determine the product of one 1-digit factor with the other factor having no more than 3 digits or the quotient of a dividend having no more than 3 digits and a 1-digit divisor using whole numbers (0-5000) c. determine the product of a decimal in	C. Number Computation 1. analyze number relations or compute to: a. add or subtract proper fractions or mixed numbers with denominators as factors of 60 and answers in simplest form (0-20) b. multiply proper fractions or mixed numbers with denominators as factors of 24 not including 24 and express answers in simplest form (0-20) c. multiply a decimal with no more than 3-digits by a 2 digit decimal (0-1000) d. divide a decimal with no more than a 5-digits by whole number with no more than 2 digits without annexing zeros (0-1000) e. determine 10%, 20%, 25% or 50% of a whole number (0-1000) f. use the distributive property to simplify numeric expressions using whole numbers (0-1000) 2. estimate to: a. determine the product of a decimal with no more than a 3-digits by a 2-digit whole number or the quotient of a decimal with no more than a 4-digits in the dividend by a 2-digit whole number (0-1000)	C. Number Computation 1. analyze number relationships or compute to: a. add, subtract, multiply, or divide integers (use one operation and –100 to 100) b. add, subtract, or multiply positive fractions or mixed numbers with denominators as factors of 300 less than 101 (use no more than 2 operations and 0-2000) c. calculate powers using no more than 3 exponents of whole numbers (0-20) or integers (-10 to 10) or square roots of perfect square whole numbers (0-100) d. simplify using the rules of exponents (power x power or power divided by power) with the same whole numbers base (0-100) and exponents (0-10) e. identify or use the commutative property of addition and multiplication, associative property of addition or multiplication, additive inverse property, the distributive property, or the identity property for one or zero with whole numbers (0-100) 2. estimate to: a. determine the sum, difference, product or quotient of no more than 3 positive rational numbers (0-1000) 3. analyze ratios, proportions, or percents to: a. determine equivalent ratios with denominators as factors of 300 less than 101 using whole numbers (0-100) b. determine or use ratios, rates, unit rates or	C. Number Computation 1. analyze number relationships or compute to: a. add, subtract, multiply, or divide integers (use one operation and –1000 to 1000) b. calculate powers using bases no more than 12 and exponents no more than 3 or square roots of perfect squares no more than 144 c. simplify using the rules of exponents (power x power or power divided by power) with the same integer as a base (-20 to 20) and exponents (0-10) d. identify or use the commutative property of addition and multiplication, associative property of addition or multiplication, additive inverse property, the distributive property, or the identity property for one or zero with integers (-100 to 100) 2. estimate to: a. determine square roots of whole numbers (0-100) b. determine percents, rate of increase/decrease, discount, commission, sales tax, or simple interest in the context of a problem using positive rational numbers (0-10,000) 3. analyze ratios, proportions, or percents to: a. determine unit rates using positive rational numbers (0-100) b. determine or use percents, rate of increase/decrease, discount, commission, sales tax, or simple interest in the context of a

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	whole numbers (0-1000)	monetary notation by a single digit whole number (0-100)		percents in the context of a problem using whole numbers (0-1000)	problem using positive rational numbers (0-10,000) c. use proportional reasoning to solve problems using positive rational numbers (0- 1000)

7.0 Process of Mathematics – Students will demonstrate the processes of mathematics by making connections and applying reasoning to solve problems and to communicate their findings.

A. Problem solving 1. apply a variety of concepts, processes, and skills to solve problems a. identify the question in the problem b. decide if enough information is present to solve the problem c. make a plan to solve a problem d. apply a strategy, ie draw a picture, guess and check, finding a pattern, writing an equation e. select a strategy, ie. draw a picture, guess and check, finding a pattern, writing an equation f. identify alternative ways to solve a problem g. show that a problem might have no solution or multiple solutions h. extend the solution of a problem to a new problem situation
B. Reasoning 1. justify ideas or solutions with mathematical concepts or proofs a. use inductive or deductive reasoning b. make or test generalizations c. support or refute mathematical statements or solutions d. use methods of proof, ie. direct, indirect, paragraph, or contradiction
C. Communication 1. present mathematical ideas using words, symbols, visual displays, or technology a. use multiple representations to express concepts or solutions b. express mathematical ideas orally c. explain mathematically ideas in written form d. express solutions using concrete materials e. express solutions using pictorial, tabular, graphical, or algebraic methods f. explain solutions in written form g. ask questions about mathematical ideas or problems h. give or use feedback to revise mathematical thinking
D. Connections 1. relate or apply mathematics within the discipline, to other disciplines, and to life a. identify mathematical concepts in relationship to other mathematical concepts b. identify mathematical concepts in relationship to other disciplines c. identify mathematical concepts in relationship to life d. use the relationship among mathematical concepts to learn other mathematical concepts

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