PA Core Standards For Mathematics
2.2 Algebraic Concepts PreK-12

Grade	Big Idea	Essential Questions	Concepts	Competencies	Standard	Eligible Content	Vocabulary
Pre-K	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can recognizing repetition or regularity assist in solving problems more efficiently?	Addition and Subtraction	Represent addition and subtraction with objects, fingers, mental images, and drawings, sounds, acting out situations, verbal explanations, expressions, or equations. Explain adding and subtracting sets of objects up to and including six.	CC.2.2.PREK.A.1		Above Addition Below Beside Between Circle Cone Cube Cylinder Equal Greater than Length Less than Measure Numeral Rectangle Sphere Square Subtraction Triangle Weight
K	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can recognizing repetition or regularity assist in solving problems more efficiently?	Addition and Subtraction	Represent addition and subtraction with objects, fingers, mental images, and drawings, sounds acting out situations, verbal explanations, expressions, or equations. Decompose numbers less than or equal to 10 into pairs in more than one way, by using objects or drawings, and record each decomposition by a drawing or equation. Find the number that makes 10, for any number from 1 to 9, when added to the given number, by using objects or drawings, and record the answer with a drawing or equation. Solve addition and subtraction word	CC.2.2.K.A.1		Addition Area Capacity Circle Cone Corners (vertices) Cube Cylinder Digit Equal Greater than Length Less than Ones Place value Quantity Rectangle

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				problems, and add and subtract within 10, by using objects or drawings to represent the problem.			Sides Sphere Square Subtraction Tens Total Triangle Weight
1	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently?	Addition and Subtraction	Use addition and subtraction within 20 to solve word problems by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. Add and subtract within 20. Use strategies such as counting on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction and creating equivalent but easier or known sums. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.	CC.2.2.1.A.1		Addend Addition Analog Circle Compare compose/ Cone Counting on Cube Cylinder Data decompose Equal to Fourths Fractions – Greater than Half circles Half-hour Halves Hour Length Less than Making ten Ones Place value Quarter-circles Quarters Rectangle Rectangular Prism Square
1	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations	Properties of Operations	Apply properties of operations as strategies to add and subtract (commutative property of addition; associative property of addition). Understand subtraction as an unknown-addend problem. For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.	CC.2.2.1.A.2		

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	Patterns exhibit relationships that can be extended, described, and generalized.	and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? How can patterns be used to describe relationships in mathematical situations?					Subtraction Sum Tens Trapezoids Triangle
2	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently?	Addition and Subtraction	Use addition and subtraction within 100 to solve one- and two-step word problems by using drawings and equations with a symbol for the unknown number to represent the problem. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20. Understand subtraction as an unknown-addend problem. For example, subtract 10 – 8 by finding the number that makse 10 when added to 8. Add and subtract within 20. Use strategies such as counting on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equivalent but easier or known sums.	CC.2.2.2.A.1		A.M. Addend Analog/digital Angles Bar graph Centimeter Compose Decompose Dime Dollar Equation Equivalent Estimate Even Expanded form Faces Feet Fractions – Thirds Hexagon Hundreds Inch Line plot Meter Money Nickel Odd P.M. Penny Pentagon
2	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically?	Properties of Operations	Fluently add and subtract within 20 using mental strategies. Apply properties of operations as strategies to add and subtract (commutative property of addition; associative property of addition).	CC 2.2.2.A.2		

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Grade	Big Idea	Essential Questions	Concepts	Competencies	Standard	Eligible Content	Vocabulary
	mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized.	How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? How can patterns be used to describe relationships in mathematical situations?					Picture graph Place value Quadrilateral Quarter Sum
2	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized.	How is mathematics used to quantify, compare, represent, and model numbers? How are relationships represented mathematically? How can patterns be used to describe relationships in mathematical situations? How can patterns be used to describe relationships in mathematical situations?	Equal Groups of Objects	Determine whether a group of objects (up to 20) has an odd or even number of members and write an equation to express an even number as a sum of two equal addends. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	CC.2.2.2.A.3		
3	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or	Multiplication and Division	Demonstrate an understanding of properties of multiplication. Demonstrate an understanding of the relationship between multiplication and division. Demonstrate fluency.	CC.2.2.3.A.1 CC.2.2.3.A.2 CC.2.2.3.A.3	M03.B-O.1.1.1 M03.B-O.1.1.2 M03.B-O.1.2.1 M03.B-O.1.2.2 M03.B-O.2.1.1 M03.B-O.2.1.2 M03.B-O.2.2.1	Area Denominator Division Equivalent fractions Estimate Fraction Linear Liquid Volume Mass Numerator Pattern Pentagon

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Grade	Big Idea	Essential Questions	Concepts	Competencies	Standard	Eligible Content	Vocabulary
		analyze mathematical situations?					Perimeter Pictograph
3	Mathematical relationships among numbers can be represented, compared, and communicated. Patterns exhibit relationships that can be extended, described, and generalized. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. Data can be modeled and used to make inferences.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How can patterns be used to describe relationships in mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently? How can data be organized and represented to provide insight into the relationship between quantities? How can probability and data analysis be used to make predictions?	Patterns	Represent and solve problems. Identify and explain patterns in arithmetic (including addition and subtraction).	CC.2.2.3.A.4	M03.B-O.3.1.1 M03.B-O.3.1.2 M03.B-O.3.1.3 M03.B-O.3.1.4 M03.B-O.3.1.5 M03.B-O.3.1.6 M03.B-O.3.1.7	Polygon Quadrilateral Rhombus Round Square Unit Tally Chart Temperature
4	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Patterns exhibit relationships that can be	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can patterns be used to describe relationships in mathematical situations?	Number Theory	Represent and solve problems verbally as equations. Use factors to represent numbers in various ways. Recognize that a whole number is a multiple of each of its factors.	CC.2.2.4.A.1 CC.2.2.4.A.2	M04.B-O.1.1.1 M04.B-O.1.1.2 M04.B-O.1.1.3 M04.B-O.1.1.4 M04.B-O.2.1.1	Acute Angle Angle Decimal Decimal Fraction Equivalence Factor Line Line of symmetry Line Segment Mixed Number Multiple

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Grade	Big Idea	Essential Questions	Concepts	Competencies	Standard	Eligible Content	Vocabulary
	extended, described, and generalized.						Obtuse Angle Point Ray Right Angle Symmetry Unit Fraction Weight
4	Mathematical relationships among numbers can be represented, compared, and communicated. Patterns exhibit relationships that can be extended, described, and generalized. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. Data can be modeled and used to make inferences.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How can patterns be used to describe relationships in mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently? How can data be organized and represented to provide insight into the relationship between quantities? How can probability and data analysis be used to make predictions?	Patterns	Generate and analyze patterns that follow a single rule.	CC.2.2.4.A.4	M04.B-O.3.1.1 M04.B-O.3.1.2 M04.B-O.3.1.3	
5	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations, and inequalities in mathematical situations.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How can expressions, equations, and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?	Numerical Expressions	Write and interpret numerical expressions.	CC.2.2.5.A.1	M05.B-O.1.1.1 M05.B-O.1.1.2	Braces Brackets Coordinate Plane Cubic Units Decimal Place Value (through thousandths) Measurement Systems Measurement Units Numerical
5	Mathematical relationships	How is mathematics used to	Order of	Evaluate expressions using the order of	CC.2.2.5.A.1	M05.B-O.1.1.1	

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	among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations, and inequalities in mathematical situations.	quantify, compare, represent, and model numbers? How can mathematics support effective communication? How can expressions, equations, and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?	Operations	operations.		M05.B-O.1.1.2	Expressions Order of Operations Origin Parentheses Scaling (resizing) Unit Fraction Volume X-axis X-coordinate Y-axis Y-coordinate
5	Patterns exhibit relationships that can be extended, described, and generalized. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. Data can be modeled and used to make inferences.	How can patterns be used to describe relationships in mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently? How can data be organized and represented to provide insight into the relationship between quantities? How does the type of data influence the choice of display? How can probability and data analysis be used to make predictions?	Patterns	Generate, analyze and compare patterns.	CC.2.2.5.A.4	M05.B-O.1.1.2 M05.B-O.2.1.1 M05.B-O.2.1.2	
6	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and	How is mathematics used to quantify, compare, represent, and model numbers? How are relationships represented mathematically? How can mathematics support	Algebraic Expressions	Write, identify and evaluate numerical expressions involving exponents. Write, read and evaluate algebraic expressions. Apply the properties of operations to generate equivalent expressions.	CC.2.2.6.B.1	M06.B-E.1.1.1 M06.B-E.1.1.2 M06.B-E.1.1.3 M06.B-E.1.1.4 M06.B-E.1.1.5	Absolute value Algebraic expressions Box and whisker plots Coefficient Compound polygon

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Grade	Big Idea	Essential Questions	Concepts	Competencies	Standard	Eligible Content	Vocabulary
	inequalities in mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized.	effective communication? How can recognizing repetition or regularity assist in solving problems more efficiently?					Dependent variable Distributive property Dot plots Exponent Greatest Common Factor Independent variable Inequality Integer Interquartile range Irregular Polygon Least Common Multiple Mean Mean absolute deviation
6	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently? How can data be organized and represented to provide insight into the relationship between quantities?	Algebraic Equations	Represent and analyze quantitative relationships between Independent and dependent variables. Solve and interpret one variable equations or inequalities in real world and mathematical problems.	CC.2.2.6.B.2 CC.2.2.6.B.3	M06.B-E.2.1.1 M06.B-E.2.1.2 M06.B-E.2.1.3 M06.B-E.2.1.4 M06.B-E.3.1.1 M06.B-E.3.1.2	
7	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships	How is mathematics used to quantify, compare, represent, and model numbers? How are relationships	Algebraic Expressions	Apply properties of operations to generate equivalent expressions.	CC.2.2.7.B.1	M07.B-E.1.1.1	Acute triangle Adjacent angles Alternate exterior angles Alternate interior angles

Grade	Big Idea	Essential Questions	Concepts	Competencies	Standard	Eligible Content	Vocabulary
	can be represented as expressions, equations and inequalities in mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized.	represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently?					Chance event Circumference Complementary angles Compound event Corresponding angles Data distribution decrease Equally likely Equilateral triangle Independent event Isosceles triangle Likely event Linear expression Obtuse triangle Outcome Percent increase and Population Probability Process of chance Proportion Random sample Relative frequency Repeating decimal Scale drawing Scalene triangle
7	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. Data can be modeled and used to make inferences.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? How can data be organized and represented to provide insight into the relationship between quantities? How does the type of data influence the choice of display? How can probability and data analysis be used to make predictions?	Algebraic Equations	Model and solve real world and mathematical problems using multiple representations such as algebraic, graphical and using tables. Solve multi-step equations or inequalities with one variable. Solve and interpret multi-step real life and mathematical problems posed with positive and negative rational numbers.	CC.2.2.7.B.3	M07.B-E.2.1.1 M07.B-E.2.2.1 M07.B-E.2.2.2 M07.B-E.2.3.1	

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8	Mathematical relationships among numbers can be represented, compared, and communicated.	How is mathematics used to quantify, compare, represent, and model numbers?	Expressions	Apply concepts of integer exponents to generate equivalent expressions. Use and evaluate square roots and cube roots to represent solutions to equations.	CC.2.2.8.B.1	M08.B-E.1.1.1 M08.B-E.1.1.2 M08.B-E.1.1.3 M08.B-E.1.1.4	Bivariate data Clustering Coefficient Cone Congruence Congruent figures Cube root Cylinder Dilations Function Irrational number Line of best fit Linear association Linear equation Negative correlation Non-Linear association Outlier Perfect cube Perfect square Positive correlation Pythagorean theorem Rate of change Rational number Reflection Relation Rotation Scatterplot Scientific notation Similarity Simultaneous linear
8	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. Data can be modeled and used to make inferences.	How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? How can data be organized and represented to provide insight into the relationship between quantities? How does the type of data influence the choice of display?	Linear Equations	Analyze and describe linear relationships between two variables, using slope. Make connections between slope, lines and linear equations. Interpret solutions to a linear equation and systems of two linear equations. Analyze, model and solve linear equations. Analyze and solve pairs of simultaneous equations.	CC.2.2.8.B.2 CC.2.2.8.B.3	M08.B-E.2.1.1 M08.B-E.2.1.2 M08.B-E.2.1.3 M08.B-E.3.1.1 M08.B-E.3.1.2 M08.B-E.3.1.3 M08.B-E.3.1.4 M08.B-E.3.1.5	
8	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Mathematical relations and functions can be modeled through multiple	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?	Functions	Define, interpret, and compare functions displayed algebraically, graphically, numerically in tables, or by verbal descriptions. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	CC.2.2.8.C.1 CC.2.2.8.C.2	M08.B-F.1.1.1 M08.B-F.1.1.2 M08.B-F.1.1.3 M08.B-F.2.1.1 M08.B-F.2.1.2	

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	representations and analyzed to raise and answer questions. Data can be modeled and used to make inferences.	How can data be organized and represented to provide insight into the relationship between quantities? How can probability and data analysis be used to make predictions?					equations Slope Sphere Square root Transformation Translation Two-way table y-intercept
ALG 1	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication?	Polynomial and Rational Expressions	Simplify/factor expressions involving polynomials. Use polynomial identities. Perform arithmetic operations on polynomials. Apply and extend previous understandings of arithmetic to algebraic expressions.	CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.4 CC.2.2.HS.D.5 CC.2.2.HS.D.6	A1.1.1.5.1 A1.1.1.5.2 A1.1.1.5.3	Absolute Value Additive Inverse Additive Property of Equality Algorithm Arithmetic Sequence Associative Property Asymptote Bar Graph Binomial Bivariate Data Boundary Line Bounded Region Circle Graph Coefficient Commutative Property Composite Number Compound Event Compound Inequality Degree (of
ALG 1	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?	Equations and Inequalities	Write, solve, and/or graph linear equations and inequalities using various methods. Write, solve, and/or graph systems of linear equations and inequalities using various methods. Use and/or identify algebraic properties.	CC.2.2.HS.C.1 CC.2.2.HS.C.2 CC.2.2.HS.C.3	A1.2.1.1.1 A1.2.1.1.2 A1.2.1.1.3 A1.2.2.1.1 A1.2.2.1.2 A1.2.2.1.3 A1.2.2.1.4 A1.2.1.2.1 A1.2.1.2.2 A1.1.2.1.1 A1.1.2.1.2 A1.1.2.1.3	
ALG 1	Mathematical relationships among numbers can be represented, compared, and communicated.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support	Equations and Inequalities	Understand and apply the Pythagorean Theorem. Write, solve, and/or graph compound inequalities.	CC.2.2.HS.C3 CC.2.2.HS.C5 CC.2.2.HS.C9 CC.2.2.HS.D7 CC.2.2.HS.D9	A1.1.2.1.1 A1.1.2.1.2 A1.1.2.1.3 A1.2.1.1.1 A1.2.1.1.2	

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	Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.	effective communication? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?		Write and/or identify linear equations in various forms (slope-intercept, point-slope, standard, etc.). Describe, compute, and/or use linear rate of change (slope).	CC.2.2.HS.D10	A1.2.1.1.3 A1.2.1.2.1 A1.2.1.2.2 A1.2.2.1.1 A1.2.2.1.2 A1.2.2.1.3 A1.2.2.1.4 A1.1.2.2.1 A1.1.2.2.2 A1.1.3.1.1 A1.1.3.1.2 A1.1.3.1.3 A1.1.3.2.1 A1.1.3.2.2	polynomial) Dependent Events Domain (of Relation or Function) Equivalent Exponential Equation Exponential Expression Exponential Function Exponential Growth/Decay Extrapolate Frequency Function Geometric Sequence Half-Plane Independent Events Independent Variable Index Interpolate Interquartile Range Inverse (of a Relation) Inverse Operation Maximum Value (of a Graph) Measure of Central Tendencies Measure of
ALG 1	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. Data can be modeled and	How is mathematics used to quantify, compare, represent, and model numbers? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently? How can patterns be used to describe relationships in mathematical situations? How can data be organized and represented to provide insight into the relationship between	Patterns, Relations, and Functions	Define, evaluate, and compare functions. Use the concept and notation of function to interpret and apply them in terms of their context. Construct and compare linear, quadratic, and exponential models and solve problems. Create a function and/or sequence that model relationships between two quantities. Create and/or analyze functions using multiple representations (graph, table, and equation). Create new functions from existing functions (transformations of graphs).	CC.2.2.HS.C.1 CC.2.2.HS.C.2 CC.2.2.HS.C.3 CC.2.2.HS.C.4 CC.2.2.HS.C.6	A1.2.1.1.1 A1.2.1.1.2 A1.2.1.1.3 A1.2.2.1.1 A1.2.2.1.2 A1.2.2.1.3 A1.2.2.1.4 A1.2.1.2.1 A1.2.1.2.2 A1.1.2.1.1 A1.1.2.1.2 A1.1.2.1.3	

Grade	Big Idea	Essential Questions	Concepts	Competencies	Standard	Eligible Content	Vocabulary
	used to make inferences.	quantities? How does the type of data influence the choice of display? How can probability and data analysis be used to make predictions?					Dispersion Minimum Value (of a Graph) Multiplicative Inverse Multiplicative Property of Equality Multiplicative Property of Zero Mutually Exclusive Event Negative Exponent Odds Outlier Point-Slope Form Polynomial Function Positive Exponents Probability of Compound Events Quadrants Quadratic Functions Quartile Radical Expression Range Rate (of Change) Relation Repeating Decimal Scatterplot

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							Simple Event Simplest form (of an Expression) Slope-Intercept Form Standard Form (of a Linear Equation) Substitution Method Systems of Linear Equations Systems of Linear Inequalities Terminating Decimal Test Point Trinomial Unbounded Region
ALG 1	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication?	Polynomial and Rational Expressions	Simplify/factor expressions involving polynomials. Use polynomial identities. Perform arithmetic operations on polynomials. Apply and extend previous understandings of arithmetic to algebraic expressions.	CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.4 CC.2.2.HS.D.5 CC.2.2.HS.D.6	A2.1.2.2.1 A2.1.2.2.2 A2.1.3.1.1 A2.1.3.1.2 A2.1.3.1.3 A2.1.3.1.4	Asymptote Binomial Combination Common Logarithm Complex Number System Compound Events Dependent/Independent Events Dilation Exponential
ALG 2	Mathematical relationships among numbers can be represented, compared, and communicated.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support	Equations and Inequalities	Create and/or solve equations (including literal, polynomial, rational, radical, exponential, and logarithmic) both algebraically and graphically.	CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.D.10	A2.1.2.1.3 A2.1.2.1.4 A2.1.2.2.2 A2.1.3.1.1 A2.1.3.1.3	

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Grade	Big Idea	Essential Questions	Concepts	Competencies	Standard	Eligible Content	Vocabulary
	Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.	effective communication? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?		Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. Use and/or explain reasoning while solving equations, and justify the solution method. Determine how a change in one variable relates to a change in a second variable.		A2.1.3.1.4 A2.1.3.2.1 A2.1.3.2.2 A2.2.2.1.2 A2.2.2.1.3	Exponential Decay Exponential Function Exponential Growth Expression Extrema Geometric Sequence Imaginary Number Increasing/Decreasing Intervals Intercept Inverse of a Function Logarithm Natural Logarithm Negative Exponents Observational Study Outcomes Perfect Square Trinomial Permutation Polynomial Polynomial Identity Probability Quadratic Formula Quadratic Function Radical Functions Rational Functions
ALG 2	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Patterns exhibit relationships that can be extended, described, and generalized. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. Data can be modeled and used to make inferences.	How is mathematics used to quantify, compare, represent, and model numbers? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently? How can patterns be used to describe relationships in mathematical situations? How can data be organized and represented to provide insight into the relationship between quantities? How does the type of data influence the choice of display? How can probability and data analysis be used to make	Functions	Use the concept and notation of function to interpret and apply them in terms of their context. Using the unit circle, extend the domain of trigonometric functions to all real numbers. Interpret functions in terms of the situations they model. Use trigonometric functions to model periodic phenomena. Prove the Pythagorean identity and use it to calculate trigonometric ratios. Create and/or analyze functions using multiple representations (graph, table, and equation). Create a function and/or sequence that model a relationship between two quantities. Create new functions from existing functions (transformations and/or inverses of functions). Construct and compare linear, quadratic, exponential, and logarithmic models to solve problems.	CC.2.2.HS.C.1 CC.2.2.HS.C.2 CC.2.2.HS.C.3 CC.2.2.HS.C.4 CC.2.2.HS.C.5 CC.2.2.HS.C.6 CC.2.2.HS.C.7 CC.2.2.HS.C.8 CC.2.2.HS.C.9	A2.2.1.1.3 A2.2.1.1.4 A2.2.2.1.1 A2.2.2.1.2 A2.2.2.1.3 A2.2.2.1.4 A2.2.2.2.1	

Grade	Big Idea	Essential Questions	Concepts	Competencies	Standard	Eligible Content	Vocabulary
		predictions?					Reflection Regression Models Root Functions Sample Survey Scatterplot Standard Deviation Statistical Experiment Transformation Translations Trinomial Unit Circle
GEO	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.	How is mathematics used to quantify, compare, represent, and model numbers? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?	Functions	Use the concept and notation of function to interpret and apply them in terms of their context. Prove the Pythagorean identity and use it to calculate trigonometric ratios.	CC.2.2.HS.C.1 CC.2.2.HS.C.9	G.2.2.2.1 G.2.2.2.2 G.2.2.2.3 G.2.2.2.4 G.2.2.2.5 G.1.3.2.1 G.2.1.1.1 G.2.1.1.2	