Priority Learning Standard(s): Mathematics

How to Use this Information

This document identifies the Next Generation Learning Standards (NGLS) in Mathematics that have been identified as priority learning standard(s). This identification involved the examination of the NGLS in Mathematics by the NYC DOE in collaboration with the UFT and CSA, and was informed by the *2020–21 Priority Instructional Content in English Language Arts/Literacy and Mathematics* developed by Student Achievement Partners. This document outlines the areas that have been identified as most important and should help teachers know where to invest their time and efforts as they plan for instruction that addresses unfinished learning within the context of rich, culturally responsive grade level work. Strong core instruction that is culturally responsive and paired with formative assessment will be the key to teachers pinpointing unfinished learning and responding in real-time through strategic instruction that offers ***"just in time"*** supports, and in the context of grade level standards. To support this type of formative assessment, you will notice this document illustrates the expectations outlined in priority learning standard(s) along a progression. Intentional choices were made to break down the language of the standards to reflect the discrete skills that students should know and be able to do at each grade level. For more information about addressing unfinished learning in the context of grade level priority learning standard(s), refer to this overview.

Priority Learning for Mathematics: Kindergarten to Grade 2

Priority Learning Domain	Core Skills, Knowledge and Understandings *Students will…*		
	Grade K	**Grade 1**	**Grade 2**
Counting and Cardinality	**Know number names and the count sequence.** *NY-K-CC 1-3* ● Count to 100 by ones and by tens; beginning from any given number ● Read and write numbers from 0 to 20; Representing a number of objects with a written numeral 0-20.	***No Counting and Cardinality identified as Priority for Grade 1***	***No Counting and Cardinality identified as Priority for Grade 2***
Operations and Algebraic Thinking	**Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.** *NY-K.OA 1-5* ● Represent addition and subtraction using objects, fingers, pennies, drawings, sounds, acting out situations, verbal explanations, expressions, equations, or other strategies..	**Represent and solve problems involving addition and subtraction.** *NY-1.OA 1-6* ● Fluently add and subtract within 10 ● Develop strategies for adding and subtracting whole numbers using a variety of discrete and length based models,	**Represent and solve problems involving addition and subtraction** *NY-2.OA 1 -2* ● Use their understanding of addition to develop fluency with addition and subtraction within 100 by applying their understanding of models for addition and subtraction ● Fluently add and subtract within 20 using mental strategies.

	● Fluently add and subtract within 5. Solve word problems adding and subtracting within 10. ● Decompose numbers less than or equal to 10 into pairs in more than one way.	● Understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two); ● Use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., "making tens") to solve addition and subtraction problems within 20; ● Decomposing a number leading to 0 ● Using the relationship between addition and subtraction	● Using the relationship between addition and subtraction ● Create equivalent but easier or known sums ● Know from memory all sums within 20 of two one-digit numbers.
Number and Operations in Base Ten	**Work with number 11-19 to gain foundations for place value.** *NY-K.NBT* ● Compose and decompose the numbers from 11 to 19 into ten ones and one, two, three, four, five, six, seven, eight, or nine ones	**Understand place value** *NY-1.NBT 2-3* ● Develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10 ● Compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes	**Understand place value.** NY-2.NBT1- 2 ● Count in fives, tens, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing; and ● Understand multi-digit numbers (up to 1000) written in base-ten notation
Geometry	**Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).** *NY-K.G 1-3* ● Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to. ● Understand the difference between two-dimensional (lying in a plane, "flat") and three dimensional ("solid") shapes.	***No Geometry Standards identified as Priority for Grade 1***	***No Geometry Standards identified as Priority for Grade 2***
Measurement and Data	**Describe and compare measurable attributes** *NY-K.MD 1-2* ● Describe attributes of an object(s), such as length or weight, using appropriate vocabulary, and compare two objects with a common measurable attribute and describe the difference.	**Measure lengths indirectly and by iterating length units.** *NY-1.MD 1* ● Develop an understanding of the meaning and processes of measurement,	**Relate addition and subtraction to length.** *NY-2.MD 5-6* ● Recognize the need for standard units of measure (centimeter and inch) and use rulers and other measurement tools with the understanding that linear measure involves an iteration ● Recognize that the smaller the unit, the more iterations needed to cover a given length.

	Classify objects and count the number of objects in each category *NY-K.MD 3-4* ● Classify objects into categories; count the objects in each category and sort the categories by count. ● Explore coins (pennies, nickels, dimes, and quarters) and begin identifying pennies and dimes.		

K -2 Resources:

Achieve the Core Priority Learning

NYS Next Generation Mathematics Learning Standards

Priority Learning for Mathematics: Grades 3 - 5

Priority Learning: Domain	Core Skills, Knowledge and Understandings *Students will…*		
	Grade 3	Grade 4	Grade 5
Operations and Algebraic Thinking	**Represent and solve problems involving multiplication and division.** *NY-3.OA.1-4* ● Interpret whole number quotients and products of whole numbers ● Develop an understanding of the meanings of multiplication and division of whole numbers through activities involving equal-sized groups, arrays, and area models **Understand properties of multiplication and the relationship between multiplication and division.** *NY-3.OA.5&6* ● Apply the commutative, associative, and distributive property of multiplication to multiply and divide ● Understand division as an unknown-factor problem **Multiply and divide within 100.** *NY-3.OA.7* ● Develop fluency with multiplication and division (fast, accurate, flexible and with understanding) by comparing a variety of solution strategies ● Know from memory all products of two one-digit numbers **Solve problems involving the four operations, and identify and extend patterns in arithmetic.** *NY-3.OA.8* ● Solve two-step word problems with whole numbers and having whole-number answers using the four operations ● Represent problems using equations or expressions with a letter representing the unknown quantity ● Analyze, make sense of situations presented in word problems and persevere in solving them	**Use the four operations with whole numbers to solve problems.** *NY-4.OA.1-3* ● Interpret a multiplication equation as a comparison ● Solve multiplication and division situations as multiplicative comparisons ● Use drawings and equations with a symbol for the unknown number ● Solve multi-step word problems with whole numbers with whole number answers using four operations ● Solve division problems in which remainders must be interpreted ● Represent problems using equations or expressions with a letter standing for the unknown quantity ● Assess reasonableness of answers	*No Operations and Algebraic Thinking Standards identified as Priority for Grade 5*

Number and Base Ten Operations	*No Number and Operations in Base Ten Standards identified as Priority for Grade 3*	**Generalize place value understanding for multi-digit whole numbers** *NY-4.NBT.1-3* ● Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right ● Read, write multi-digit whole numbers using base-ten numerals, number names, expanded form ● Compare multi-digit numbers based on place value meanings using >, <, = ● Use place value understanding to round multi-digit whole numbers to any place	**Understand the place value system** *NY-5.NBT.1-4* ● Recognize that in a multi-digit number, a digit in one place represents ten times as much as it represents in the place to its right and 1/10 of what is represented in the place to its left. ● Read, write, and compare decimals to the thousandths using base-ten numerals, number names, and expanded form ● Use place value understanding to round decimals to any place ● Use whole number exponents to denote powers of 10 ● Explain patterns in the number of zeros of the product when multiplying by powers of 10 ● Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10
			Perform operations with multi-digit whole numbers and with decimals to the hundredths *NY-5.NBT.5-7* ● Apply understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths ● Develop fluency with decimal computations to hundredths, and make reasonable estimates of their results ● Use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers, to understand and explain why the procedures for multiplying and dividing finite decimals make sense
Number and Operations-Fractions	**Develop understanding of fractions as numbers** *NY-3.NF.1-3* ● Develop an understanding of fractions, beginning with unit fractions ● View fractions in general as being built out of unit fractions, and use fractions along with visual fraction models to represent parts of a whole	**Extend understanding of fraction equivalence and ordering** *NY-4.NF.1-2* ● Explain why a fraction is equivalent to a fraction by using visual fraction models ● Recognize and generate equivalent fractions	**Use equivalent fractions as a strategy to add, subtract fractions** *NY-5.NF.1-2* ● Add and subtract fractions with unlike denominators by replacing given fractions with equivalent fractions ● Solve word problems involving addition and subtraction of fractions referring to the same whole

	● Understand that the size of a fractional part is relative to the size of the whole ● Use fractions to represent numbers equal to, less than, and greater than one ● Solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators	● Compare fractions with different numerators and denominators ● Recognize that comparisons are valid only when the two fractions refer to the same whole **Understand decimal notation for fractions, and compare decimal fractions** *NY-4.NF.5-7* ● Express a fraction with denominator 10 as an equivalent fraction with denominator 100 ● Use knowledge of such equivalence to add two fractions with respective denominators 10 and 100 ● Use decimal notation for fractions with denominators 10 or 100 ● Compare two decimals to hundredths by reasoning about their size	● Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers **Apply and extend previous understandings of multiplication and division to multiply and divide fractions** *NY-5.NF.3-7* ● Interpret a fraction as division of the numerator by the denominator ● Apply and extend previous understandings of multiplication to multiply a fraction by a whole number or fraction ● Interpret multiplication as scaling ● Solve real world problems involving multiplication of fractions and mixed numbers through the use of visual fraction models or equations to represent the problem ● Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions
Geometry	*No Geometry Standards identified as Priority for Grades 3-5*		
Measurement and Data	*No Measurement and Data Standards identified as Priority for Grades 3-5*		

3 - 5 Resources:

- Achieve the Core Priority Learning
- NYS Next Generation Mathematics Learning Standards

Department of Education

Priority Learning for Mathematics: Grades 6 - 8

Priority Learning Domain	Core Skills, Knowledge and Understandings *Students will…*		
	Grade 6	Grade 7	Grade 8
Ratios and Proportional Relationships	**Understand ratio concepts and use ratio reasoning to solve problems.** *NY-6.RP.1 - 3* ● Use reasoning about multiplication and division to solve ratio and rate problems about quantities; ● Connect understanding of multiplication and division with ratios and rates by viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities; and ● Expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions.	**Analyze proportional relationships and use them to solve real-world and mathematical problems.** *NY-7.RP.1-3* ● Extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems; ● Use their understanding of ratios and proportionality to solve a wide variety of percent problems; ● Solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects; ● Graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line; and ● Distinguish proportional relationships from other relationships	*No RP standards in Grade 8*
The Number System	**Apply and extend previous understandings of multiplication and division to divide fractions by fractions.** *NY-6.NS.1* ● Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions. **Compute fluently with multi-digit numbers and find common factors and multiples.** *NY-6.NS.4* ● Find the greatest common factor of two whole numbers less than or equal to 100. Use the distributive	**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** *NY-7.NS.1-3* ● Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers. Represent addition and subtraction on a horizontal or vertical number line. ● Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	*No 8th grade NS priority standards*

	property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor other than 1. Find the least common multiple of two whole numbers less than or equal to 12.	• Solve real-world and mathematical problems involving the four operations with rational numbers.	
Expressions, Equations, and Inequalities	**Apply and extend previous understandings of arithmetic to algebraic expressions** *NY-6.EE.1 - 9* • Write expressions and equations that correspond to given situations, using variables to represent an unknown and describe relationships between quantities; • Understand that expressions in different forms can be equivalent, and use the properties of operations to rewrite and evaluate expressions in equivalent forms; and • Use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations.	**Use properties of operations to generate equivalent expression.** *NY-7.EE.1-2* • Add, subtract, factor, and expand linear expressions with rational coefficients by applying the properties of operations. • Understand that rewriting an expression in different forms in real-world and mathematical problems can reveal and explain how the quantities are related.	**Work with radicals and integer exponents**. *NY-8.EE.1 -2* • Know and apply the properties of integer exponents to generate equivalent numerical expressions. • Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Know square roots of perfect squares up to 225 and cube roots of perfect cubes up to 125. Know that the square root of a non-perfect square is irrational.
		Solve real-life and mathematical problems using numerical and algebraic expressions, equations, and inequalities. *NY-7.EE3.3-4*	**Understand the connections between proportional relationships, lines, and linear equations**. *8.EE 5 - 6*

		• Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. Assess the reasonableness of answers using mental computation and estimation strategies. • Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.	• Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. • Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b. **Analyze and solve linear equations and pairs of simultaneous linear equations.** 8.EE 7 - 8 • Solve linear equations in one variable. • Analyze and solve pairs of simultaneous linear equations.
Geometry	*No 6th grade G priority standards*	*No 7th grade G priority standards*	**Understand congruence and similarity using physical models, transparencies, or geometry software** *NY-8.G.4 and 5* • Know that a two-dimensional figure is similar to another if the corresponding angles are congruent and the corresponding sides are in proportion. Equivalently, two two-dimensional figures are similar if one is the image of the other after a sequence of rotations, reflections, translations, and dilations. Given two similar two-dimensional figures, describe a sequence that maps the similarity between them on the coordinate plane. • Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

Statistics and Probability	*No Statistics and Probability standards listed as priority*		
Functions	No function standards in 6th grade	No function standards in 7th grade	**Define, evaluate, and compare functions**. *NY-8 F.1- 3* ● Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. ● Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). ● Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line. Recognize examples of functions that are linear and nonlinear. **Use functions to model relationships between quantities**. *NY-8.F.4 - 5* ● Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. 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. ● Describe qualitatively the functional relationship between two quantities by analyzing a graph.

Middle School Math Citations:
6- 8 Priority Document
NGMLS

High School Courses: Algebra I, Algebra II and Geometry

Conceptual Category	Core Skills, Knowledge and Understandings Students will...	
	Algebra 1	Algebra 2
Number and Quantity: The Real Number System		**Extend the properties of exponents to rational exponents** *AII-N.RN.1-2* ● Explore how the meaning of rational exponents follows from extending the properties of integer exponents. ● Convert between radical expressions and expressions with rational exponents using the properties of exponents.
Number and Quantity: Quantities		*Not in Algebra 2*
Algebra: Seeing Structure in Expressions	**Interpret the structure of expressions** *AI-A.SEE.1-2* ● Interpret expressions that represent a quantity in terms of its context. ● Recognize and use the structure of an expression to identify ways to rewrite it.	**Interpret the structure of expressions** *AII-A.SSE.2* ● Recognize and use the structure of an expression to identify ways to rewrite it.
	Write expressions in equivalent forms to reveal their characteristics *AI-A.SSE.3* ● Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ● Use the properties of exponents to rewrite exponential expressions.	**Write expressions in equivalent forms to reveal their characteristics** *AII-A.SSE.3* ● Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ● Factor quadratic expressions including leading coefficients other than 1 to reveal the zeros of the function it defines. ● Use the properties of exponents to rewrite exponential expressions.
Algebra: Arithmetic with Polynomials and	**Perform arithmetic operations on polynomials** *AI-A.APR.1* ● Add, subtract, and multiply polynomials and recognize that the result of the operation is also a polynomial. This forms a system analogous to the integers.	

Rational Expressions	**Understand the relationship between zeros and factors of polynomials** *AI-A.APR.3* ● Identify zeros of polynomial functions when suitable factorizations are available.	**Understand the relationship between zeros and factors of polynomials** *AII-A.APR.3* ● Identify zeros of polynomial functions when suitable factorizations are available. ● Apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).
		Rewrite rational expressions *AII-A.APR.6* ● Rewrite rational expressions in different forms: Write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x).

Algebra: Creating Equations	**Create equations that describe numbers or relationships.** *AI-A.CED1-4*
	● Create equations and inequalities in one variable to represent a real-world context.
	● Create equations and linear inequalities in two variables to represent a real-world context.
	  ● Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.
	  ● Rewrite formulas to highlight a quantity of interest, using the same reasoning as in solving equations
		Create equations that describe numbers or relationships. *AII-A.CED.1*
		● Create equations and inequalities in one variable to represent a real-world context.

Algebra: Reasoning with Equations and Inequalities	**Understand solving equations as a process of reasoning and explain the reasoning** *AI-A.REI.1* ● Explain each step when solving a linear or quadratic equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. ● Construct a viable argument to justify a solution method.	**Understand solving equations as a process of reasoning and explain the reasoning** *AII-A.REI.1-2* ● Explain each step when solving a linear or quadratic equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. ● Construct a viable argument to justify a solution method. ● Solve rational and radical equations in one variable, identify extraneous solutions, and explain how they arise.
	Solve equations and inequalities in one variable *AI-A.REI.3-4* ● Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. ● Solve quadratic equations in one variable.	**Solve equations and inequalities in one variable** *AII-A.REI.4* ● Solve quadratic equations in one variable.

	Solve systems of equations *AI-A.REI.6-7* ● Solve systems of linear equations in two variables both algebraically and graphically. ● Solve a system, with rational solutions, consisting of a linear equation and a quadratic equation (parabolas only) in two variables algebraically and graphically.	
	Represent and solve equations and inequalities graphically *AI-A.REI.10-12* ● Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. ● Given the equations y = f(x) and y = g(x): ○ recognize that each x-coordinate of the intersection(s) is the solution to the equation f(x) = g(x) ○ find the solutions approximately using technology to graph the functions or make tables of values ○ interpret the solution in context ● Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	**Represent and solve equations and inequalities graphically** *AII-A.REI.11* ● Given the equations y = f(x) and y = g(x): ○ recognize that each x-coordinate of the intersection(s) is the solution to the equation f(x) = g(x) ○ find the solutions approximately using technology to graph the functions or make tables of values ○ find the solution of f(x) < g(x) or f(x) ≤ g(x) graphically ○ interpret the solution in context
Functions: Interpreting Functions	**Understand the concept of a function and use function notation** *AI-F.IF.1-3* ● Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x). Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. ● Recognize that a sequence is a function whose domain is a subset of the integers.	**Understand the concept of a function and use function notation** *AII-F.IF.3* ● Recognize that a sequence is a function whose domain is a subset of the integers.
	Interpret functions that arise in applications in terms of the context *AI-F.IF.4-6* (For a function that models a relationship between two quantities:) ● Interpret key features of graphs and tables in terms of the quantities; and ● Sketch graphs showing key features given a verbal description of the relationship. ● Determine the domain of a function from its graph and, where applicable, identify the appropriate domain for a function in context.	**Interpret functions that arise in applications in terms of the context** *AII-F.IF.4-6* (For a function that models a relationship between two quantities:) ● Interpret key features of graphs and tables in terms of the quantities; and ● Sketch graphs showing key features given a verbal description of the relationship. ● Calculate and interpret the average rate of change of a function over a specified interval.

	• Calculate and interpret the average rate of change of a function over a specified interval.	
	Analyze functions using different representations. *AI-F.IF7-9* • Graph functions and show key features of the graph by hand and by using technology where appropriate. • Graph linear, quadratic, and exponential functions and show key features. • Graph square root, and piecewise-defined functions, including step functions and absolute value functions and show key features. • Write a function in different but equivalent forms to reveal and explain different properties of the function. • For a quadratic function, use an algebraic process to find zeros, maxima, minima, and symmetry of the graph, and interpret these in terms of context. • Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)	Analyze functions using different representations. *AII-F.IF7-9* • Graph functions and show key features of the graph by hand and by using technology where appropriate. • Graph polynomial functions identifying zeros when suitable factorizations are available, and showing end behavior. • Graph cube root, exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. • Write a function in different but equivalent forms to reveal and explain different properties of the function. • Use properties of exponents to interpret exponential functions, and classify them as representing exponential growth or decay. • Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)
Functions: Building Functions	**Build a function that models a relationship between two quantities.** *AI-F.BF1* • Write a function that describes a relationship between two quantities. • Determine a function from context. • Define a sequence explicitly or steps for calculation from a context.	**Build a function that models a relationship between two quantities.** *AII-F.BF1-2* • Write a function that describes a relationship between two quantities. • Determine a function from context. Determine an explicit expression, a recursive process, or steps for calculation from a context. • Combine standard function types using arithmetic operations. • Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
	Build new functions from existing functions. *AI-F.BF3* Using *f(x) + k, k f(x),* and *f(x + k):* • Identify the effect on the graph when replacing *f(x)* by *f(x) + k*, *k f(x),* and *f(x + k)* for specific values of *k* (both positive and negative) • Find the value of *k* given the graphs • Write a new function using the value of *k* • Use technology to experiment with cases and explore the effects on the graph.	

Functions: Linear, Quadratic and Exponential Models	**Construct and compare linear, quadratic, and exponential models and solve problems.** *AI-F.LE1-3* ● Distinguish between situations that can be modeled with linear functions and with exponential functions. ● Justify that a function is linear because it grows by equal differences over equal intervals, and that a function is exponential because it grows by equal factors over equal intervals. ● Recognize situations in which one quantity changes at a constant rate per unit interval relative to another, and therefore can be modeled linearly. ● Recognize situations in which one quantity grows or decays by a constant percent rate per unit interval relative to another, and therefore can be modeled exponentially. ● Construct a linear or exponential function symbolically given: a graph, a description of the relationship, and two input-output pairs (include reading these from a table). ● Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	**Construct and compare linear, quadratic, and exponential models and solve problems.** *AII-F.LE2-4* ● Construct a linear or exponential function symbolically given: a graph, a description of the relationship, and two input-output pairs (include reading these from a table). ● Use logarithms to solve exponential equations, such as $ab^{ct} = d$ (where *a, b, c,* and *d* are real numbers and $b > 0$) and evaluate the logarithm using technology.
	Interpret expressions for functions in terms of the situation they model. *AI-F.LE5* ● Interpret the parameters in a linear or exponential function in terms of a context.	
Trigonometric Functions	**N/A**	*There are no applicable standards from this conceptual category.*
Statistics and Probability: Interpreting Categorical and Quantitative Data	**Interpret linear models** *AI-S.ID.7-9* ● Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. ● Calculate (using technology) and interpret the correlation coefficient of a linear fit. ● Distinguish between correlation and causation	
		Summarize, represent and interpret data on two categorical and quantitative variables. *AII-S.ID6* ● Represent bivariate data on a scatter plot, and describe how the variables' values are related.

		● Fit a function to real-world data; use functions fitted to data to solve problems in the context of the data.
Statistics and Probability: Making Inferences and Justifying Conclusions		**Understand and evaluate random processes underlying statistical experiments.** *AII-S.IC2* ● Determine if a value for a sample proportion or sample mean is likely to occur based on a given simulation.
		Make inferences and justify conclusions from sample surveys, experiments, and observational studies. *AII-S.IC3-6* ● Recognize the purposes and differences among surveys, experiments, and observational studies. Explain how randomization relates to each. ● Given a simulation model based on a sample proportion or mean, construct the 95% interval centered on the statistic (+/- two standard deviations) and determine if a suggested parameter is plausible. ● Use the tools of statistics to critique claims from informational texts. For example causation vs. correlation, bias, measures of center and spread.
Statistics and Probability: Conditional Probability and the Rules of Probability		

Resources:

JMAP Algebra II Doc

JMAP Alg I Standards

Widely Applicable PreReqs

SAP / Achieve the Core Coherence Map

NGMLS

Crosswalks and Snapshots

Domains	Core Skills, Knowledge and Understandings Students will...
	Geometry
Congruence (G-CO) (27%-34%)	**Experiment with the transformations in the plane.** *GEO-G.CO.1-5* ● Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. ● Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch). ● Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. ● Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. ● Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
	Understand congruence in terms of rigid motions. *GEO-G.CO.6-8* ● Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. ● Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. ● Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
	Prove geometric theorems. *GEO-G.CO.9-11* ● Prove theorems about lines and angles. ● Prove theorems about triangles. ● Prove theorems about parallelograms.
	Make geometric constructions. *GEO-G.CO.12-13* ● Make formal geometric constructions with a variety of tools and methods ● Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
Circles (2%-8%)	*Contains only additional content to indicate emphasis within the course*

Similarity, Right Triangles, and Trigonometry (29%-37%)	**Understand similarity in terms of similarity transformations.** *GEO-G.SRT.1-3* ● Verify experimentally the properties of dilations given by a center and scale factor. ● Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar. Explain using similarity transformations that similar triangles have equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. ● Use the properties of similarity transformations to establish the AA~, SSS~, and SAS~ criterion for two triangles to be similar.
	Prove theorems using similarity. *GEO-G.SRT.4-5* ● Prove and apply similarity theorems about triangles. ● Use congruence and similarity criteria for triangles to solve problems algebraically and geometrically and prove relationships in geometric figures.
	Define trigonometric ratios and solve problems involving right triangles. *GEO-G.SRT.6-8* ● Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of sine, cosine and tangent ratios for acute angles. ● Explain and use the relationship between the sine and cosine of complementary angles. ● Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.
Modeling with Geometry (8%-15%)	**Apply geometric concepts in modeling situations.** *GEO-G.MG.1-3* ● Use geometric shapes, their measures, and their properties to describe objects. ● Apply concepts of density based on area and volume in modeling situations. ● Apply geometric methods to solve design problems.
Expressing Geometric Properties with Equations (12%-18%)	**Use coordinates to prove simple geometric theorems algebraically.** *GEO-G-GPE.4-7* ● Use coordinates to prove simple geometric theorems algebraically. ● Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems. ● Find the point on a directed line segment between two given points that partitions the segment in a given ratio. ● Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula
Geometric Measurement and Dimensions (2%-8%)	*Contains only additional content to indicate emphasis within the course*

Geometry Resource

Widely Applicable PreReqs

SAP / Achieve the Core Coherence Map

NGMLS

Crosswalks and Snapshots

Geometry JMAP Overview Doc