CENT PERCENT MATHEMATICS

100% Success for 8bn+ in 100% K-12 Math

Ace 'AI & Industry 4.0 Era'

Amplify Your AIQ & Wealth

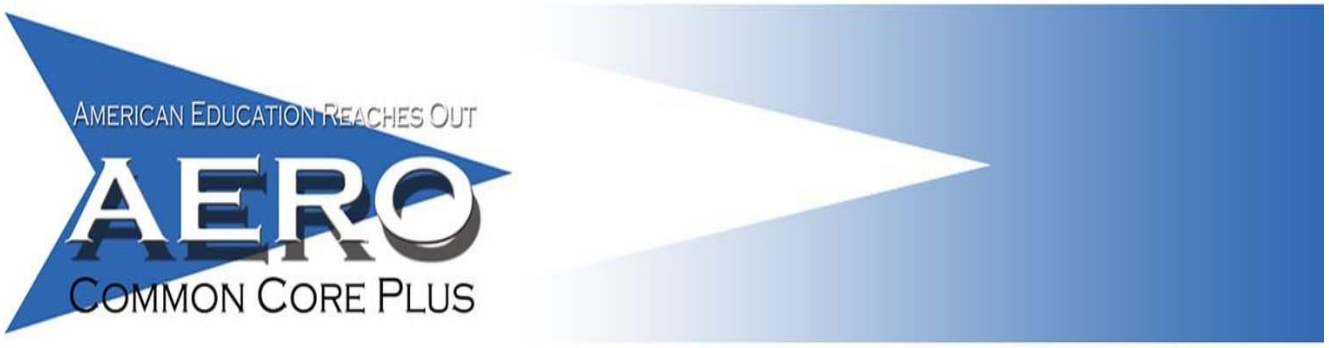
Uses AERO, or, US 'Common Core Plus' Mathematics Curriculum, for the overall academic planning.

The choice of AERO is to ensure progressive integrity of MATHEMATICAL THINKING in the lessons.

However, the lesson content shall be based the unique 'A – Z' Mathematics that we have authored.

'A - Z ' Mathematics is THE FIRST-EVER mathematics learning resource that is threaded by MATHEMATICAL LOGIC.
The very conception and creation of 'A - Z' Mathematics implied truly 100% Mathematics, that mathematises thinking.

The combining of the curricular detailing of mathematics by AERO, and the visualisation and verbalisation of 'A - Z' Mathematics, is the magic, awaited for 200 years.



CURRICULUM FRAMEWORK FOR MATH

About AERO

American Education Reaches Out (AERO) is a project supported by the United States Department of Education's Office of Overseas Schools, which establishes an implementation framework for international American schools which offer a standards-based U.S. curriculum.

Aligned with Common Core standards and Next Generation Science Standards, AERO is considered to be "Common Core Plus," providing an "enduring understanding, essential questions and learning progression."

Why US Common Core Mathematics?

It is one of the best curriculum for learning MATHEMATICAL THINKING. That is, to MATHEMATISE THINKING.

In these times of ever-sharpening Artificial (General) Intelligence, mathematised thinking is the only way to be successful. The typical rote, methodised, logic-less mathematics is of no value.

This curriculum will also empower foundation for success in ALL School System Curricula, globally.

The Background

One of the primary reasons, for poor mathematics education, is the lack of distinction, between mathematics content (largely methods, and practice), and mathematical thinking. This ambiguity, is also reflected, in assessment, and in evaluation.

The education system assumes, that teaching mathematics compulsorily, is enough, by itself, to develop mathematical thinking.

But, why content, and thinking, are different? That is, why the methods, and ceaseless practice, in mathematics education, does not promote mathematised mind.

For, the content does not focus on logic, process, reasoning, and the history of relevant mathematical concepts.

Briefly, mathematical thinking is not, thinking about the subject matter of mathematics, but, a way of looking, at situations, and conditions. It is critical for success in all academic 'subjects.'

Progressions 6-8			
Domain: Ratios and Proportional Relationships	**6**	**7**	**8**
Understand ratio concepts and use ratio reasoning to solve problems.	AERO. 6.RP.1 **DOK 1,2** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities	AERO. 7.RP.2 **DOK 1,2** Recognize and represent proportional relationships between quantities	
	AERO. 6.RP.2 **DOK 1,2** Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship	AERO. 7.RP.1 **DOK 1,2** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.	
	AERO. AERO. 6.RP.3 **DOK 1,2** Use ratio and rate reasoning to solve real-world and mathematical problems	AERO. AERO. 7.RP.2a **DOK 1,2** Decide whether two quantities are in a proportional relationship	
	AERO. 6.RP.3a **DOK 1,2** Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	AERO. 7.RP.2d **DOK 1,2** Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.	AERO. 8.EE.5 **DOK 1,2,3** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

Domain: Ratios and Proportional Relationships	6	7	8
Understand ratio concepts and use ratio reasoning to solve problems.		AERO. 7.RP.2b **DOK 1,2** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships	AERO. 8.EE.6 **DOK 1,2,3** 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
	AERO. 6.RP.3b **DOK 1,2** Solve unit rate problems including those involving unit pricing and constant speed.	AERO. 7.RP.2c **DOK 1,2** Represent proportional relationships by equations.	
	AERO. 6.RP.3c **DOK 1,2** Find a percent of a quantity as a rate per 100 ; solve problems involving finding the whole, given a part and the percent		
	AERO. 6.RP.3d **DOK 1,2** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	AERO. 7.RP.3 **DOK 1,2** Use proportional relationships to solve multistep ratio and percent problems..	

Domain: The Number System	6	7	8
Apply and extend previous understandings of multiplication and division to divide fractions by fractions	AERO. 6.NS.1 **DOK 1,2** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.?	AERO. 7.NS.1 **DOK 1,2** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers;	
		AERO. 7.NS.1a **DOK 1,2** Describe situations in which opposite quantities combine to make 0	
		AERO. 7.NS.1b **DOK 1,2** Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.	
		AERO. 7.NS.1c **DOK 1,2** Understand subtraction of rational numbers as adding the additive inverse, p - q = p + (-q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts	
		AERO. 7.NS.1d **DOK 1,2** Apply properties of operations as strategies to add and subtract rational numbers.	
		AERO. 7.NS.2c **DOK 1,2** Apply properties of operations as strategies to add and subtract rational numbers	

Domain: The Number System	6	7	8
Compute fluently with multi-digit numbers and find common factors and multiples.	AERO. 6.NS.2 **DOK 1** Fluently divide multi-digit numbers using the standard algorithm.	AERO. 7.NS.2d **DOK 1,2** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	
Know that there are numbers that are not rational, and approximate them by rational numbers.			AERO. 8.NS.1 **DOK 1** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
Compute fluently with multi-digit numbers and find common factors and multiples.	AERO. 6.NS.3 **DOK 1** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	AERO. 7.NS.3 **DOK 1,2** Solve real-world and mathematical problems involving the four operations with rational numbers	
	AERO. 6.NS.4 **DOK 1** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive 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.		

Domain: The Number System	6	7	8
Apply and extend previous understandings of numbers to the system of rational numbers	AERO. 6.NS.5 **DOK 1,2** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values ; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation	AERO. 7.NS.2 **DOK 1,2** Describe situations in which opposite quantities combine to make 0.	
	AERO. 6.NS.6 **DOK 1** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates		
	AERO. 6.NS.6a **DOK 1** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite.	AERO. 7.NS.2a **DOK 1,2** Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.	AERO. 8.NS.2 **DOK 1,2** Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2).
		AERO. 7.NS.2b **DOK 1,2** Understand subtraction of rational numbers as adding the additive inverse, p - q = p + (-q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	

Domain: The Number System	6	7	8
Apply and extend previous understandings of numbers to the system of rational numbers	AERO.6.NS.6b **DOK 1** Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes		
	AERO. 6.NS.6c **DOK 1** Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane		
	AERO. 6.NS.7 **DOK 1,2** Understand ordering and absolute value of rational numbers.		
	AERO. 6.NS.7a **DOK 1,2** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.		
	AERO. 6.NS.7b **DOK 1,2** Write, interpret, and explain statements of order for rational numbers in real-world contexts..		
	AERO. 6.NS.7c **DOK 1,2** Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.		

Domain: The Number System	6	7	8
Apply and extend previous understandings of numbers to the system of rational numbers	AERO. 6.NS.7d **DOK 1,2** Distinguish comparisons of absolute value from statements about order.		
	AERO. 6.NS.8 **DOK 1,2** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.		

Domain: Expressions and Equations	6	7	8
Apply and extend previous understandings of arithmetic to algebraic expressions. **Work with radicals and integer exponents (G.8)**	AERO. 6.EE.1 **DOK 1** Write and evaluate numerical expressions involving whole-number exponents		AERO. 8.EE.1 **DOK 1** Know and apply the properties of integer exponents to generate equivalent numerical expressions.
	AERO. 6.EE.2 **DOK 1,2** Write, read, and evaluate expressions in which letters stand for numbers.		AERO. 8.EE.2 **DOK 1** Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational
	AERO. 6.EE.3 **DOK 1,2** Write expressions that record operations with numbers and with letters standing for numbers.		
	AERO. 6.EE.3a **DOK 1,2** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.		
	AERO. 6.EE.3b **DOK 1,2** Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).	AERO. 7.EE.2 **DOK 1,2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.	AERO. 8.EE.3 **DOK 1,2** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.

Domain: Expressions and Equations	6	7	8
Apply and extend previous understandings of arithmetic to algebraic expressions. **Work with radicals and integer exponents (G.8)**	AERO. 6.EE.3c **DOK 1,2** Apply the properties of operations to generate equivalent expressions.	AERO. 7.EE.1 **DOK 1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	AERO. 8.EE.4 **DOK 1,2** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities Interpret scientific notation that has been generated by technology
	AERO. 6.EE.4 **DOK 1** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).		
	AERO. 6.EE.5 **DOK 1** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.		
	AERO. 6.EE.6 **DOK 1,2** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set		

Domain: Expressions and Equations	6	7	8
Apply and extend previous understandings of arithmetic to algebraic expressions. **Solve real-life and mathematical problems using numerical and algebraic expressions and equations. (Grade 7)**	AERO. 6.EE.7 **DOK 1,2** Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.	AERO. 7.EE.3 **DOK 1,2,3** Solve multi-step real-life 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; and assess the reasonableness of answers using mental computation and estimation strategies.	
	AERO. 6.EE.8 **DOK 1,2** Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.		
	AERO. 6.EE.9 **DOK 1,2,3** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.	AERO. 7.EE.4 **DOK 1,2,3** 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	

Domain: Expressions and Equations	6	7	8
Solve real-life and mathematical problems using numerical and algebraic expressions and equations. (Grade 7)		AERO. 7.EE.4a **DOK 1,2,3** Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.	
		AERO. 7.EE.4b **DOK 1,2,3** Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.	
Analyze and solve linear equations and pairs of simultaneous linear equations.			AERO. 8.EE.7 **DOK 1,2** Solve linear equations in one variable.
			AERO. 8.EE.7a **DOK 1,2** Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).

Domain: Expressions and Equations	6	7	8
Analyze and solve linear equations and pairs of simultaneous linear equations.			AERO. 8.EE.7b **DOK 1,2** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
			AERO. 8.EE.8 **DOK 1,2,3** Analyze and solve pairs of simultaneous linear equations.
			AERO. 8.EE.8a **DOK 1,2,3** Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
			AERO. 8.EE.8b **DOK 1,2,3** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.
			AERO. 8.EE.8c **DOK 1,2,3** Solve real-world and mathematical problems leading to two linear equations in two variables.

Domain: Geometry	6	7	8
Solve real-world and mathematical problems involving area, surface area, and volume.	AERO. 6.G.1 **DOK 1,2** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems	AERO. 7.G.4 **DOK 1,2** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle	AERO. 8.G.9 **DOK 1,2** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
	AERO. 6.G.2 **DOK 1,2** Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems	AERO. 7.G.6 **DOK 1,2** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	
	AERO. 6.G.3 **DOK 1,2** Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problem		

Domain: Geometry	6	7	8
Draw construct, and describe geometrical figures and describe the relationships between them.	AERO. 6.G.4 **DOK 1,2** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	AERO. 7.G.1 **DOK 1,2** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	
		AERO. 7.G.2 **DOK 1,2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	
		AERO. 7.G.3 **DOK 1,2** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	
		AERO. 7.G.5 **DOK 1,2** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure	

Domain: Geometry	6	7	8
Understand congruence and similarity using physical models, transparencies, or geometry software.			AERO. 8.G.1 **DOK 2** Verify experimentally the properties of rotations, reflections, and translations:
			AERO. 8.G.1a **DOK 2** Lines are taken to lines, and line segments to line segments of the same length.\
			AERO. 8.G.1b **DOK 2** Angles are taken to angles of the same measure.
			AERO. 8.G.1c **DOK 2** Parallel lines are taken to parallel lines.
			AERO. 8.G.2 **DOK 1,2** Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
			AERO. 8.G.3 **DOK 1,2** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates

Domain: Geometry	6	7	8
Understand congruence and similarity using physical models, transparencies, or geometry software.			AERO. 8.G.4 **DOK 1,2** Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
			AERO. 8.G.5 **DOK 1,2,3** 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.
Understand and apply the Pythagorean Theorem.			AERO. 8.G.6 **DOK 2,3** Explain a proof of the Pythagorean Theorem and its converse.
			AERO. 8.G.7 **DOK 1,2** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
			AERO. 8.G.8 **DOK 1,2** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system

Domain: Functions	6	7	8
Define, evaluate, and compare functions.			AERO. 8.F.1 **DOK 1,2** 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
			AERO. 8.F.2 **DOK 1,2** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
			AERO. 8.F.3 **DOK 1,2** Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

Domain: Functions	6	7	8
Use functions to model relationships between quantities.			AERO. 8.F.4 **DOK 1,2,3** 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
			AERO. 8.F.5 **DOK 1,2,3** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear).Sketch a graph that exhibits the qualitative features of a function that has been described verbally

Domain: Statistics and Probability	6	7	8
Develop understanding of statistical variability. **Use random sampling to draw inferences about a population (Grade 3)**	AERO. 6.SP.1 **DOK 1** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.	AERO. 7.SP.1 **DOK 2** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	
	AERO. 6.SP.2 **DOK 1,2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	AERO. 7.SP.2 **DOK 2,3** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.	
	AERO. 6.SP.3 **DOK 1** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number		
Draw informal comparative inferences about two populations. (Grade 7)		AERO. 7.SP.3 **DOK 2,3** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.	

Domain: Statistics and Probability	6	7	8
Summarize and describe distributions. **Investigate patterns of association in bivariate data.(Grade 8)**	AERO. 6.SP.4 **DOK 1,2** Display numerical data in plots on a number line, including dot plots, histograms, and box plots		AERO. 8.SP.1 **DOK 1,2,3** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association
	AERO. 6.SP.5 **DOK 1,2,3** Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations		AERO. 8.SP.2 **DOK 1,2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
	AERO. 6.SP.5b **DOK 1,2,3** Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.		AERO. 8.SP.3 **DOK 1,2** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
	AERO. 6.SP.5c **DOK 1,2,3** Use quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.		AERO. 8.SP.4 **DOK 1,2,3** Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

Domain: Statistics and Probability	6	7	8
Summarize and describe distributions. **Draw informal comparative inferences about two populations. (Grade 7)**	AERO. 6.SP.5d **DOK 1,2,3** Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	AERO. 7.SP.4 **DOK 2,3** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.	
Investigate chance processes and develop, use, and evaluate probability models.		AERO. 7.SP.5 **DOK 1** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	
		AERO. 7.SP.6 **DOK 2,3** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability..	
		AERO. 7.SP.7 **DOK 2,3** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.	

Domain: Statistics and Probability	6	7	8
Investigate chance processes and develop, use, and evaluate probability models.		AERO. 7.SP.7a **DOK 2,3** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.	
		AERO. 7.SP.7b **DOK 2,3** Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.	
		AERO. 7.SP.8a **DOK 1, 2,3** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs	
		AERO. 7.SP.8b **DOK 1, 2,3** Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event	
		AERO. 7.SP.8c **DOK 1,2,3** Design and use a simulation to generate frequencies for compound events.	

Mathematical Practices	6	7	8
1. Make sense of problems and persevere in solving them.	Solve problems involving ratios and rates and discuss how they solved them. Solve real world problems through the application of algebraic and geometric concepts. Seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves, "What is the most efficient way to solve the problem?", "Does this make sense?", and "Can I solve the problem in a different way?".	Solve problems involving ratios and rates and discuss how they solved them. Solve real world problems through the application of algebraic and geometric concepts. Seek the meaning of a problem and look for efficient ways to represent and solve it. Check their thinking by asking themselves, "What is the most efficient way to solve the problem?", "Does this make sense?", and "Can I solve the problem in a different way?".	Solve real world problems through the application of algebraic and geometric concepts. Seek the meaning of a problem and look for efficient ways to represent and solve it. Check their thinking by asking themselves, "What is the most efficient way to solve the problem?", "Does this make sense?", and "Can I solve the problem in a different way?"
2. Reason abstractly and quantitatively.	Represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.	Represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.	Represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Examine patterns in data and assess the degree of linearity of functions. Contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.

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3. Construct viable arguments and critique the reasoning of others.	Construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). Refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. Pose questions like "How did you get that?", "Why is that true?" "Does that always work?" Explain their thinking to others and respond to others' thinking.	Construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). Refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. Pose questions like "How did you get that?", "Why is that true?" "Does that always work?". They explain their thinking to others and respond to others' thinking.	Construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). Refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. Pose questions like "How did you get that?", "Why is that true?" "Does that always work?" They explain their thinking to others and respond to others' thinking.

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4. Model with mathematics.	Model problem situations symbolically, graphically, tabularly, and contextually. Form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Explore covariance and represent two quantities simultaneously. Use number lines to compare numbers and represent inequalities. Use measures of center and variability and data displays (i.e. box plots and histograms) to draw inferences about and make comparisons between data sets. Connect and explain the connections between the different representations. Use all of these representations as appropriate to a problem context.	Model problem situations symbolically, graphically, tabularly, and contextually. Form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Explore covariance and represent two quantities simultaneously. Use measures of center and variability and data displays (i.e. box plots and histograms) to draw inferences, make comparisons and formulate predictions. Students use experiments or simulations to generate data sets and create probability models. Connect and explain the connections between the different representations. Use all of these representations as appropriate to a problem context.	Model problem situations symbolically, graphically, tabularly, and contextually. Form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Solve systems of linear equations and compare properties of functions provided in different forms. Use scatterplots to represent data and describe associations between variables. Connect and explain the connections between the different representations. Use all of these representations as appropriate to a problem context.

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5. Use appropriate tools strategically.	Consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 6 may decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data. Use physical objects or applets to construct nets and calculate the surface area of three-dimensional figures.	Consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 7 may decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data. Use physical objects or applets to generate probability data and use graphing calculators or spreadsheets to manage and represent data in different forms.	Consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 8 may translate a set of data given in tabular form to a graphical representation to compare it to another data set. Draw pictures, use applets, or write equations to show the relationships between the angles created by a transversal.
6. Attend to precision.	Continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Use appropriate terminology when referring to rates, ratios, geometric figures, data displays, and components of expressions, equations or inequalities.	Continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Define variables, specify units of measure, and label axes accurately. Use appropriate terminology when referring to rates, ratios, probability models, geometric figures, data displays, and components of expressions, equations or inequalities.	Continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Use appropriate terminology when referring to the number system, functions, geometric figures, and data displays.

Mathematical Practices	6	7	8
S	Routinely seek patterns or structures to model and solve problems. For instance, students recognize patterns that exist in ratio tables recognizing both the additive and multiplicative properties. Apply properties to generate equivalent expressions (i.e. 6 + 2x = 2 (3 + x) by distributive property) and solve equations (i.e. 2c + 3 = 15, 2c = 12 by subtraction property of equality; c=6 by division property of equality). Compose and decompose two- and three-dimensional figures to solve real world problems involving area and volume.	Seek patterns or structures to model and solve problems. For instance, students recognize patterns that exist in ratio tables making connections between the constant of proportionality in a table with the slope of a graph. Apply properties to generate equivalent expressions (i.e. 6 + 2x = 2 (3 + x) by distributive property) and solve equations (i.e. 2c + 3 = 15, 2c = 12 by subtraction property of equality; c=6 by division property of equality). Compose and decompose two- and three-dimensional figures to solve real world problems involving scale drawings, surface area, and volume. Examine tree diagrams or systematic lists to determine the sample space for compound events and verify that they have listed all possibilities.	Seek patterns or structures to model and solve problems. Apply properties to generate equivalent expressions and solve equations. Examine patterns in tables and graphs to generate equations and describe relationships. Experimentally verify the effects of transformations and describe them in terms of congruence and similarity.

Mathematical Practices	6	7	8
8. Look for and express regularity in repeated reasoning. (Inductive Reasoning)	Use repeated reasoning to understand algorithms and make generalizations about patterns. Solve and model problems, noticing that a/b ÷ c/d = ad/bc and construct other examples and models that confirm their generalization. Connect place value and their prior work with operations to understand algorithms to fluently divide multi-digit numbers and perform all operations with multi-digit decimals. Informally begin to make connections between covariance, rates, and representations showing the relationships between quantities.	Use repeated reasoning to understand algorithms and make generalizations about patterns. Solve and model problems, noticing that a/b ÷ c/d = ad/bc and construct other examples and models that confirm their generalization. Extend their thinking to include complex fractions and rational numbers. Formally begin to make connections between covariance, rates, and representations showing the relationships between quantities. Create, explain, evaluate, and modify probability models to describe simple and compound events.	Use repeated reasoning to understand algorithms and make generalizations about patterns. Use iterative processes to determine more precise rational approximations for irrational numbers. Analyze patterns of repeating decimals to identify the corresponding fraction. Solve and model problems, noticing that the slope of a line and rate of change are the same value. Flexibly make connections between covariance, rates, and representations showing the relationships between quantities.