GRADE 8

The Number System

Common Core State Standard	Assessment	Resources	Vocabulary
Know that there are numbers that are not rational, and approximate them by rational numbers. CCSS.Math.Content.8.NS.A.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.	**Digits** 1-1 Expressing Rational Numbers with Decimal Expansions 1-2 Exploring Irrational Numbers 1-5 Problem Solving Topic 1 Review Topic 1 Assessment	Digits Online Digits Textbook Engage NY Kuta Software Website	rational number, repeating decimal, terminating decimal, irrational number, perfect square, real numbers, square root
CCSS.Math.Content.8.NS.A.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., π^2). *For example,*	**Digits** 1-3 Approximating Irrational Numbers 1-4 Comparing and Ordering Rational and Irrational Numbers	Digits Online Digits Textbook Engage NY Kuta Software Website	rational number, repeating decimal, terminating decimal, irrational number, perfect square, real numbers, square root

by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	1-5 Problem Solving Topic 1 Review Topic 1 Assessment		

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Expressions and Equations

Common Core State Standard	**Assessment**	**Resources**	**Vocabulary**
Expressions and Equations Work with radicals and integer exponents. **CCSS.Math.Content.8.EE.A.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	**Digits** 3-3 Exponents and Multiplication 3-4 Exponents and Division 3-5 Zero and Negative Exponents 3-6 Comparing Expressions with Exponents 3-7 Problem Solving 4-5 Problem Solving	Digits Online Digits Textbook Engage NY Kuta Software Website	rational number, repeating decimal, terminating decimal, irrational number, perfect square, real numbers, square root perfect cube, cube root, power of a power, power of a product, power of a quotient, Zero Exponent Property, Negative Exponent Property
CCSS.Math.Content.8.EE.A.2 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	**Digits** 1-2 Exploring Irrational Numbers 1-4 Comparing and	Digits Online Digits Textbook Engage NY Kuta Software Website	rational number, repeating decimal, terminating decimal, irrational number,

rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.	Ordering Rational and Irrational Numbers 1-5 Problem Solving 3-1 Perfect Squares, Square Roots, and Equations of the form x^2= p 3-2 Perfect Cubes, Cube Roots, and Equations of the form x^3= p 13-2 Volumes of Cylinders 13-4 Volumes of Cones 13-5 Surface Areas of Spheres 13-6 Volumes of Spheres 13-7 Problem Solving Topic 13 Review Topic 13 Assessment		perfect square, real numbers, square root, rational number, repeating decimal, terminating decimal, irrational number, perfect square, real numbers, square root perfect cube, cylinder, height of a cylinder, base of a cylinder, lateral surface of a cylinder, right cylinder, lateral area of a cylinder, surface area of a cylinder, volume of a cylinder, cone, base of a cone, vertex of a cone, height of a cone, slant height of a cone, right cone, lateral surface of a cone, lateral area of a cone, surface area of a cone, volume of a cone, sphere, radius of a sphere, surface area of a sphere volume of a sphere
CCSS.Math.Content.8.EE.A.3 Use numbers expressed in the form of a	**Digits** 4-1 Exploring Scientific	Digits Online Digits Textbook	scientific notation, standard form

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. *For example, estimate the population of the United States as 3 times 10^8 and the population of the world as 7 times 10^9, and determine that the world population is more than 20 times larger*.	Notation 4-2 Using Scientific Notation to Describe Very Large Quantities 4-3 Using Scientific Notation to Describe Very Small Quantities 4-4 Operating with Numbers Expressed in Scientific Notation 4-5 Problem Solving Topic 4 Review Topic 4 Assessment	Engage NY Kuta Software Website	
CCSS.Math.Content.8.EE.A.4 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 (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology	**Digits** 4-1 Exploring Scientific Notation 4-4 Operating with Numbers Expressed in Scientific Notation 4-5 Problem Solving	Digits Online Digits Textbook Engage NY Kuta Software Website	scientific notation, standard form
Understand the connections between proportional relationships, lines, and linear equations. **CCSS.Math.Content.8.EE.B.5** Graph proportional relationships,	**Digits** 5-1 Graphing Proportional Relationships 5-2 Linear Equations: y= mx	Digits Online Digits Textbook Engage NY Kuta Software Website	linear equation, slope of a line, y-intercept, slope-intercept form

interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	5-3 The Slope of a Line 5-4 Unit Rates and Slope 5-7 Problem Solving Topic 5 Review Topic 5 Assessment		
CCSS.Math.Content.8.EE.B.6 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*.	**Digits** 5-2 Linear Equations: y= mx5-5 5-5 The y-intercept of a Line 5-6 Linear Equations: y= mx+ b 5-7 Problem Solving Topic 5 Review Topic 5 Assessment 10-3 Relating Similar Triangles and Slope	Digits Online Digits Textbook Engage NY Kuta Software Website	linear equation, slope of a line, y-intercept, slope-intercept form similar
Analyze and solve linear equations and pairs of simultaneous linear equations. **CCSS.Math.Content.8.EE.C.7** Solve linear equations in one variable**.**	**Digits** 2-1 Solving Two-Step Equations 2-2 Solving Equations with Variables on Both Sides 2-4 Solutions – One, None, or Infinitely Many 2-5 Problem Solving Topic 2 Review	Digits Online Digits Textbook Engage NY Kuta Software Website	isolate, like terms, Distributive Property, least common multiple, no solution, infinitely many solutions

	Topic 2 Assessment		
CCSS.Math.Content.8.EE.C.7.a 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).	**Digits** 2-4 Solutions – One, None, or Infinitely Many 2-5 Problem Solving	Digits Online Digits Textbook Engage NY Kuta Software Website	isolate, like terms, Distributive Property, least common multiple, no solution, infinitely many solutions
CCSS.Math.Content.8.EE.C.7.b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms	**Digits** 2-1 Solving Two-Step Equations 2-2 Solving Equations with Variables on Both Sides 2-3 Solving Equations Using the Distributive Property	Digits Online Digits Textbook Engage NY Kuta Software Website	isolate, like terms, Distributive Property, least common multiple, no solution, infinitely many solutions
. **CCSS.Math.Content.8.EE.C.8** Analyze and solve pairs of simultaneous linear equations**.**	**Digits** 6-1 What is a System of Linear Equations in Two Variables? 6-2 Estimating Solutions of Linear Systems by Inspection	Digits Online Digits Textbook Engage NY Kuta Software Website	system of linear equations, solution of a system of linear equations, ordered pair, substitution method,

	6-4 Solving Systems of Linear Equations Using Substitution 6-5 Solving Systems of Linear Equations Using Addition 6-6 Solving Systems of Linear Equations Using Subtraction 6-7 Problem Solving Topic 6 Review Topic 6 Assessment		addition method, subtraction method
CCSS.Math.Content.8.EE.C.8.a 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.	**Digits** 6-1 What is a System of Linear Equations in Two Variables? 6-3 Solving Systems of Linear Equations by Graphing 6-5 Solving Systems of Linear Equations Using Addition 6-6 Solving Systems of Linear Equations Using Subtraction	Digits Online Digits Textbook Engage NY Kuta Software Website	system of linear equations, solution of a system of linear equations, ordered pair, substitution method, addition method, subtraction method
CCSS.Math.Content.8.EE.C.8.b Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve	**Digits** 6-2 Estimating Solutions of Linear Systems by Inspection	Digits Online Digits Textbook Engage NY Kuta Software Website	system of linear equations, solution of a system of linear

simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6*.	6-3 Solving Systems of Linear Equations by Graphing 6-4 Solving Systems of Linear Equations Using Substitution 6-5 Solving Systems of Linear Equations Using Addition 6-6 Solving Systems of Linear Equations Using Subtraction 6-7 Problem Solving		equations, ordered pair, substitution method, addition method, subtraction method
CCSS.Math.Content.8.EE.C.8.c Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair*.	**Digits** 6-1 What is a System of Linear Equations in Two Variables? 6-3 Solving Systems of Linear Equations by Graphing 6-4 Solving Systems of Linear Equations Using Substitution 6-5 Solving Systems of Linear Equations Using Addition 6-6 Solving Systems of Linear Equations Using Subtraction 6-7 Problem Solving	Digits Online Digits Textbook Engage NY Kuta Software Website	system of linear equations, solution of a system of linear equations, ordered pair, substitution method, addition method, subtraction method

Functions			
Common Core State Standard	**Assessment**	**Resources**	**Vocabulary**
Define, evaluate, and compare functions. CCSS.Math.Content.8.F.A.1 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.[1]	**Digits** 7-1 Recognizing a Function 7-2 Representing a Function 7-4 Nonlinear Functions 8-1 Defining a Linear Function Rule	Digits Online Digits Textbook Engage NY Kuta Software Website	relation, function, input, output, mapping diagram, vertical-line test, rate of change, linear function, nonlinear function, interval linear function, linear function rule, rate of change, initial value, dependent variable, independent variable
CCSS.Math.Content.8.F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression,*	**Digits** 8-4 Comparing Two Linear Functions	Digits Online Digits Textbook Engage NY Kuta Software Website	linear function, linear function rule, rate of change, initial value, dependent variable, independent variable

determine which function has the greater rate of change.			
CCSS.Math.Content.8.F.A.3 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. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line*.	**Digits** 7-3 Linear Functions 7-4 Nonlinear Functions 8-1 Defining a Linear Function Rule 8-3 Initial Value	Digits Online Digits Textbook Engage NY Kuta Software Website	relation, function, input, output, mapping diagram, vertical-line test, rate of change, linear function, nonlinear function, interval linear function, linear function rule, rate of change, initial value, dependent variable, independent variable
Use functions to model relationships between quantities. **CCSS.Math.Content.8.F.B.4** 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	**Digits** 8-1 Defining a Linear Function Rule 8-2 Rate of Change 8-3 Initial Value 8-5 Constructing a Function to Model a Linear Relationship 8-6 Problem Solving Topic 8 Review Topic 8 Assessment 14-5 Linear Models - Fitting a Straight Line 14-6 Using the Equation of a Linear Model	Digits Online Digits Textbook Engage NY Kuta Software Website	linear function, linear function rule, rate of change, initial value, dependent variable, independent variable scatter plot, cluster, gap, outlier, trend line, median-median line

	14-7 Problem Solving		

Geometry

Common Core State Standard	Assessment	Resources	Vocabulary
Understand congruence and similarity using physical models, transparencies, or geometry software. CCSS.Math.Content.8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations:	**Digits** 9-1 Translations 9-2 Reflections 9-3 Rotations 10-1 Dilations	Digits Online Digits Textbook Engage NY Kuta Software Website	image, rigid motion, transformation, translation, line of reflection, reflection, angle of rotation, center of rotation, rotation, congruent figures, dilation
CCSS.Math.Content.8.G.A.1.a Lines are taken to lines, and line segments to line segments of the same length.	**Digits** 9-1 Translations 9-2 Reflections 9-3 Rotations	Digits Online Digits Textbook Engage NY Kuta Software Website	image, rigid motion, transformation, translation, line of reflection, reflection, angle of rotation, center of rotation, rotation,

			congruent figures
CCSS.Math.Content.8.G.A.1.b Angles are taken to angles of the same measure.	**Digits** 9-1 Translations 9-2 Reflections 9-3 Rotations	Digits Online Digits Textbook Engage NY Kuta Software Website	image, rigid motion, transformation, translation, line of reflection, reflection, angle of rotation, center of rotation, rotation, congruent figures
CCSS.Math.Content.8.G.A.1.c Parallel lines are taken to parallel lines.	**Digits** 9-1 Translations 9-2 Reflections 9-3 Rotations	Digits Online Digits Textbook Engage NY Kuta Software Website	image, rigid motion, transformation, translation, line of reflection, reflection, angle of rotation, center of rotation, rotation, congruent figures
CCSS.Math.Content.8.G.A.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	**Digits** 9-4 Congruent Figures 9-5 Problem Solving	Digits Online Digits Textbook Engage NY Kuta Software Website	image, rigid motion, transformation, translation, line of reflection, reflection, angle of rotation, center of rotation, rotation, congruent figures

CCSS.Math.Content.8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates	**Digits** 10-1 Dilations 10-2 Similar Figures 10-3 Relating Similar Triangles and Slope 10-4 Problem Solving Topic 10 Review Topic 10 Assessment	Digits Online Digits Textbook Engage NY Kuta Software Website	dilation, enlargement, reduction, scale factor, similar, indirect measurement, scale drawing
CCSS.Math.Content.8.G.A.4 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.	**Digits** 0-2 Similar Figures 10-3 Relating Similar Triangles and Slope 10-4 Problem Solving	Digits Online Digits Textbook Engage NY Kuta Software Website	dilation, enlargement, reduction, scale factor, similar, indirect measurement, scale drawing
CCSS.Math.Content.8.G.A.5 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. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so*.	**Digits** 11-1 Angles, Lines, and Transversals Lesson 11-2 Reasoning and Parallel Lines 11-3 Interior Angles of Triangles 11-4 Exterior Angles of Triangles 11-5 Angle-Angle Triangle Similarity 11-6 Problem Solving Topic 11 Review Topic 11 Assessment	Digits Online Digits Textbook Engage NY Kuta Software Website	transversal, corresponding angles, alternate interior angles, deductive reasoning, exterior angle of a triangle, remote interior angles

Understand and apply the Pythagorean Theorem. CCSS.Math.Content.8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse.	**Digits** 12-1 Reasoning and Proof 12-2 The Pythagorean Theorem 12-4 The Converse of the Pythagorean Theorem	Digits Online Digits Textbook Engage NY Kuta Software Website	proof, theorem, leg of a right triangle, hypotenuse, Pythagorean Theorem, Converse of the Pythagorean Theorem
CCSS.Math.Content.8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	**Digits** 12-2 The Pythagorean Theorem 12-3 Finding Unknown Leg Lengths 12-6 Problem Solving Topic 12 Review Topic 12 Assessment	Digits Online Digits Textbook Engage NY Kuta Software Website	proof, theorem, leg of a right triangle, hypotenuse, Pythagorean Theorem, Converse of the Pythagorean Theorem
CCSS.Math.Content.8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	**Digits** 12-5 Distance in the Coordinate Plane 12-6 Problem Solving	Digits Online Digits Textbook Engage NY Kuta Software Website	proof, theorem, leg of a right triangle, hypotenuse, Pythagorean Theorem, Converse of the Pythagorean Theorem

Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. CCSS.Math.Content.8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	**Digits** 13-1 Surface Areas of Cylinders 13-2 Volumes of Cylinders 13-3 Surface Areas of Cones 13-4 Volumes of Cones 13-5 Surface Areas of Spheres 13-6 Volumes of Spheres 13-7 Problem Solving Topic 13 Review Topic 13 Assessment	Digits Online Digits Textbook Engage NY Kuta Software Website	cylinder, height of a cylinder, base of a cylinder, lateral surface of a cylinder, right cylinder, lateral area of a cylinder, surface area of a cylinder, volume of a cylinder, cone, base of a cone, vertex of a cone, height of a cone, slant height of a cone, right cone, lateral surface of a cone, lateral area of a cone, surface area of a cone, volume of a cone, sphere, radius of a sphere, surface area of a sphere volume of a sphere

Statistics & Probability

Common Core State Standard	Assessment	Resources	Vocabulary
Investigate patterns of association in bivariate data. **CCSS.Math.Content.8.SP.A.1** 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.	**Digits** 14-1 Interpreting a Scatter Plot 14-2 Constructing a Scatter Plot 14-3 Investigating Patterns - Clustering and Outliers 14-4 Investigating Patterns - Association	Digits Online Digits Textbook Engage NY Kuta Software Website	scatter plot, cluster, gap, outlier, trend line, median-median line
CCSS.Math.Content.8.SP.A.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.	**Digits** 14-5 Linear Models - Fitting a Straight Line 14-6 Using the Equation of a Linear Model 14-7 Problem Solving	Digits Online Digits Textbook Engage NY Kuta Software Website	scatter plot, cluster, gap, outlier, trend line, median-median line

CCSS.Math.Content.8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height***.**	**Digits** 14-6 Using the Equation of a Linear Model	Digits Online Digits Textbook Engage NY Kuta Software Website	scatter plot, cluster, gap, outlier, trend line, median-median line
CCSS.Math.Content.8.SP.A.4 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. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores***?**	**Digits** 15-1 Bivariate Categorical Data 15-2 Constructing Two-Way Frequency Tables 15-3 Interpreting Two-Way Frequency Tables 15-4 Constructing Two-Way Relative Frequency Tables 15-5 Interpreting Two-Way Relative Frequency Tables 15-6 Choosing a Measure of Frequency 15-7 Problem Solving Topic 15 Review Topic 15 Assessment	Digits Online Digits Textbook Engage NY Kuta Software Website	bivariate data, categorical data, bivariate categorical data, measurement data, two-way frequency table, two-way table, two-way relative frequency table

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