



**Connecting Assessment
and Instruction for Independence**

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**Grades 5-12
Math**

**LINKS™
Curriculum:**

**Relationship Between the
Common Core Essential
Elements and Links
Lessons and Routines**



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Fifth Grade Mathematics Standards: Operation and Algebraic Thinking				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Write and interpret numerical expressions.				
5.OA.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.				
5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.				
Analyze patterns and relationships.				
5.OA.3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.	EE5.OA.3. Identify and extend numerical patterns.	Level IV AA Students will: EE5.OA.3. When given a rule, generate the pattern.		
		Level III AA Students will: EE5.OA.3. Identify and extend numerical patterns.		
		Level II AA Students will: EE5.OA.3. Extend a picture pattern.	83, 85, 138	7, 8, 10
		Level I AA Students will: EE5.OA.3. Repeat a pattern.	6, 12, 43	7, 8 10, 138

Fifth Grade Mathematics Standards: Number and Operations in Base Ten				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Understand the place value system.				
<p>5.NBT.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.</p>	<p>EE5.NBT.1. Compare numbers to each other based on place value groups by composing and decomposing to 99.</p>	<p>Level IV AA Students will: EE5.NBT.1. Compare numbers by composing and decomposing in two different ways.</p>		
		<p>Level III AA Students will: EE5.NBT.1. Compare numbers to each other based on place value groups by composing and decomposing to 99.</p>		
		<p>Level II AA Students will: EE5.NBT.1. Compare numbers to 20.</p>	116, 117	7, 10, 26
<p>5.NBT.2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.</p>	<p>EE5.NBT.2. Recognize patterns in the number of zeros when multiplying a number by powers of 10.</p>	<p>Level I AA Students will: EE5.NBT.1. Compare numbers 0-10.</p>	20, 59 60, 63	7, 10, 15
		<p>Level IV AA Students will: EE5.NBT.2. Extend patterns in the number of zeros when multiplying by the powers of 10 up to 1,000, order numbers to 100.</p>		
		<p>Level III AA Students will: EE5.NBT.2. Recognize patterns in the number of zeros when multiplying a number by powers of 10.</p>		
<p>5.NBT.3. Read, write, and compare decimals to 1000ths. Read and write decimals to 1000ths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). Compare two decimals to 1000ths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.</p>	<p>EE5.NBT.3. Round two-digit whole numbers to the nearest 10 from 0—90.</p>	<p>Level II AA Students will: EE5.NBT.2. Order multiples of ten ranging from 0-50 in sequential order least to greatest.</p>	61, 114 116, 117	7, 26
		<p>Level I AA Students will: EE5.NBT.2. Indicate the sequential order of numbers to 10.EE5.NBT.2. Indicate the sequential order of numbers to 10.</p>	20, 59, 63	7, 15
		<p>Level IV AA Students will: EE5.NBT.3. Round three-digit whole numbers to hundreds place.</p>		
		<p>Level III AA Students will: EE5.NBT.3. Round two-digit whole numbers to the nearest 10 from 0-90</p>		

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

Fifth Grade Mathematics Standards: Number and Operations in Base Ten

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level II AA Students will: EE5.NBT.3. Determine if a single-digit number is closer to zero or 10.	63	7, 10, 26
		Level I AA Students will: EE5.NBT.3. Indicate more or less than five.	20	7, 10, 15
5.NBT.4. Use place value understanding to round decimals to any place. Perform operations with multi-digit whole numbers and with decimals to hundredths.	EE5.NBT.4. Round money to a nearest dollar.	Level IV AA Students will: EE5.NBT.4. Round money to the nearest dime.		
		Level III AA Students will: EE5.NBT.4. Round money to the nearest dollar. Ex. Round coins to the nearest dollar.		
		Level II AA Students will: EE5.NB.4. Round money to the nearest dime.	117	7, 10, 26
		Level I AA Students will: EE5.NB.4. Indicate which money amount is more.	20, 60, 63	7, 10, 15
Perform operations with multi-digit whole numbers and with decimals to hundredths.				
5.NBT.5. Fluently multiply multi-digit whole numbers using the standard algorithm.	EE5.NBT.5. Multiply whole numbers up to 5 x 5.	Level IV AA Students will: EE5.NBT.5. Identify basic multiplication facts for numbers greater than five.		
		Level III AA Students will: EE5.NBT.5. Multiply whole numbers up to 5 x 5. Ex. Choose correct answer for 3 x 3.		
		Level II AA Students will: EE5.NBT.5. Use repeated addition to show multiplication with single digits 1-5.	60, 61	7, 10, 26
		Level I AA Students will: EE5.NBT.5. Use concrete representations to show numbers 1-5.	59, 62	7, 10, 15
5.NBT.6. Find whole- number quotients of whole numbers with up to four- digit dividends and two- digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.				
5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/ or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	EE5.NBT.6-7. Illustrate the concept of division using fair and equal shares.	Level IV AA Students will: EE5.NBT.6-7. Apply the concept of fair share and equal shares to solve a division problem.		

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

Fifth Grade Mathematics Standards: Number and Operations in Base Ten

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level III AA Students will: EE5.NBT.6-7. Illustrate the concept of division using fair and equal shares.		
		Level II AA Students will: EE5.NBT.6-7. Construct equal sets.	59, 61, 62	7, 10, 41
		Level I AA Students will: EE5.NBT.6-7. Replicate an equal set from a model.	4, 6, 7 12, 60	7, 10, 16

Fifth Grade Mathematics Standards: Number and Operations-Fractions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Use equivalent fractions as a strategy to add and subtract fractions.				
<p>5.NF.1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. (In general, $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$).</p>	<p>EE5.NF.1. Differentiate between halves, fourths, and eighths.</p>	<p>Level IV AA Students will: EE5.NF.1. Differentiate fractional parts less than $\frac{1}{4}$.</p>		
		<p>Level III AA Students will: EE5.NF.1. Differentiate between halves, fourths, and eighths.</p>		
		<p>Level II AA Students will: EE5.NF.1. Differentiate between whole and a part.</p>	61	7, 10, 41
		<p>Level I AA Students will: EE5.NF.1. Recognize that fractions are part of a whole.</p>	6, 26	7, 10, 16
<p>5.NF.2. Solve word problems involving5. NF.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $\frac{2}{5} + \frac{1}{2} = \frac{3}{7}$, by observing that $\frac{3}{7} < \frac{1}{2}$. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</p>	<p>EE5.NF.2. Solve two-step word problems using addition and subtraction of whole numbers.</p>	<p>Level IV AA Students will: EE5.NF.2. Solve two-step word problems using addition and subtraction of numbers after showing the problem in numerals</p>		
		<p>Level III AA Students will: EE5.NF.2. Solve two-step word problems using addition and subtraction of whole numbers.</p>		
		<p>Level II AA Students will: EE5.NF.2. Solve one-step problems using addition and subtraction.</p>	114, 117	7, 10, 26
		<p>Level I AA Students will: EE5.NF.3. Recognize words that are used for addition and subtraction.</p>	18, 58	7, 10, 15

Fifth Grade Mathematics Standards: Number and Operations-Fractions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.				
<p>5.NF.3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret $3/4$ as the result of dividing 3 by 4, noting that $3/4$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $3/4$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?</p>	EE5.NF.3. N/A (See EE5.NF.1)			
<p>5.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.) is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.</p>	EE5.NF.4-5. N/A			
<p>5.NF.5. Interpret multiplication as scaling (resizing), by: Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.</p>				

Fifth Grade Mathematics Standards: Number and Operations-Fractions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<p>5.NF.6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.</p>	<p>EE5.NF. 6-7. N/A</p>			
<p>5.NF.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. 16 example, create a story class=Section170> context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$. fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$. division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $1/3$-cup servings are in 2 cups of raisins?</p>				

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

Fifth Grade Mathematics Standards: Measurement and Data					
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines	
Convert like measurement units within a given measurement system.					
5.MD.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	EE5.MD.1.a. Tell time using an analog or digital clock to the half or quarter hour.	Level IV AA Students will: EE5.MD.1.a. Tell time using a digital clock to the minute and an analog clock to the nearest five minutes.	115	1, 2, 33	
		Level III AA Students will: EE5.MD.1.a. Tell time using an analog or digital clock to the half or quarter hour.	115	1, 2, 33	
		Level II AA Students will: EE5.MD.1.a. Tell time to the half hour using a digital clock and to the half hour using an analog clock.	115	1, 2, 33	
		Level I AA Students will: EE5.MD.1.a. Identify morning and afternoon.	46	1, 2, 33	
	EE5.MD.1.b. Use customary units to measure weight and length of objects.	Level IV AA Students will: EE5.MD.1.b. Use two customary units to measure weight and length of objects.			
		Level III AA Students will: EE5.MD.1.b. Use customary units to measure weight and length of objects.			
		Level II AA Students will: EE5.MD.1.b. Identify customary units of measurement for weight and length.			
		Level I AA Students will: EE5.MD.1.b. Identify which tools are used to weigh.	10, 11, 86	7, 10, 16	
	EE5.MD.1.c. Indicate relative value of collections of coins.	Level IV AA Students will: EE5.MD.1.c. Indicate relative value of coins and bills to each other.		117	7, 10, 26
		Level III AA Students will: EE5.MD.1.c. Indicate relative value of collections of coins.		63, 117	7, 10, 26
Level II AA Students will: EE5.MD.1.c. Identify coins (penny, nickel, dime, quarter) and their values.			63	7, 10, 15	
Level I AA Students will: EE5.MD.1.c. Match coins that are alike (penny, nickel, dime, quarter)			7, 9, 63	7, 10, 14	

Fifth Grade Mathematics Standards: Measurement and Data				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Represent and interpret data				
<p>5.MD.2. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.</p>	<p>EE5.MD.2.a. Represent and interpret data on a picture, line plot, or bar graph given a model and a graph to complete.</p>	<p>Level IV AA Students will: EE5.MD.2.a. Collect, organize, and interpret data. Create a graph using a graph template, and display the data on the graph.</p>		
		<p>Level III AA Students will: EE5.MD.2.a. Represent and interpret data on a picture, line plot, or bar graph given a model and a graph to complete.</p>		
		<p>Level II AA Students will: EE5.MD.2.a. Display data on a picture, line plot, or bar graph and answer questions about the graph.</p>		
		<p>Level I AA Students will: EE5.MD.2.a. Identify a simple graph.</p>	14, 16 37, 46	7, 10, 21
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.				
<p>5.MD.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement. A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume. A solid figure, which can be packed without gaps or overlaps using n unit cubes, is said to have a volume of n cubic units.</p>	<p>EE5.MD.3-5. Determine volume of a cube by counting units of measure.</p>	<p>Level IV AA Students will: EE5.MD.3-5. N/A</p>		
		<p>Level III AA Students will: EE5.MD.3-5. Determine volume of a cube by counting units of measure.</p>		
		<p>Level II AA Students will: EE5.MD.3-5. Identify objects that have volume.</p>		
		<p>Level I AA Students will: EE5.MD.3-5. Demonstrate solid or liquid, full or empty.</p>	91	7, 10, 41
<p>5.MD.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.</p>				

Fifth Grade Mathematics Standards: Measurement and Data				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<p>5.MD.5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. • Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.</p>				

Fifth Grade Mathematics Standards: Geometry				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Graph points on the coordinate plane to solve real-world and mathematical problems.				
<p>5.G.1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).</p>	<p>EE5.G.1-5. Sort two-dimensional figures and describe the common attributes such as angles, number of sides, corners (dimension), and color.</p>	<p>Level IV AA Students will: EE5.G.1-5. Sort into quadrant tables and describe figures by two common attributes.</p>	89, 91 100	
		<p>Level III AA Students will: EE5.G.1-5. Sort two-dimensional figures and describe the common attributes such as angles, number of sides, corners (dimension), and color.</p>	89, 91 100	
		<p>Level II AA Students will: EE5.G.1-5. Sort figures based on a given attribute.</p>	41, 19	
		<p>Level I AA Students will: EE5.G.1-5. Indicate two-dimensional shapes named.</p>	6, 12, 43 83, 85, 138	7, 8, 10 15, 26
<p>5.G.2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.</p>				
<p>5.G.3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.</p>				
<p>5.G.4. Classify two-dimensional figures in a hierarchy based on properties.</p>				

Sixth Grade Mathematics Standards: Geometry				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Solve real-world and mathematical problems involving area, surface area, and volume.				
6.G.1. 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.	EE6.G.1-2. Demonstrate area.	Level IV AA Students will: EE6.G.1-2. Find area.		
6.G.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 $V = lwh$ and lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real world and mathematical problems. $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real world and mathematical problems.				
		Level III AA Students will: EE6.G.1-2. Demonstrate area.	91, 100	
		Level II AA Students will: EE6.G.1-2. Determine what is the larger area.	91, 100	
		Level I AA Students will: EE6.G.1-2. Indicate the inside of a space.	6, 12, 15	
6.G.3. 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 problems. the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.				
6.G.4. 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.	EE6.G.4. Identify common three-dimensional shapes	Level IV AA Students will: EE6.G.4. Relate real-world items as three-dimensional shapes to their two-EE6.G.4. Relate real-world items as three-dimensional shapes to their two- dimensional representations.		

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

Sixth Grade Mathematics Standards: Geometry				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level III AA Students will: EE6.G.4. Identify common three-dimensional shapes.		
		Level II AA Students will: EE6.G.4. Sort three-dimensional shapes and two-dimensional shapes.	19, 41	
		Level I AA Students will: EE6.G.4. Match shapes.	19, 6, 12	7
Seventh Grade Mathematics Standards: Geometry				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<i>Draw construct, and describe geometrical figures and describe the relationships between them.</i>				
7.G.1. 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.	EE7.G.1-2. Draw or classify and recognize basic two-dimensional geometric shapes without a model (circle, triangle, rectangle/square).	Level IV AA Students will: EE7.G.1-2. Draw or model two-dimensional shapes including a trapezoid and rhombus without a model.		
7.G.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.		Level III AA Students will: EE7.G.1-3. Draw or classify and recognize basic two-dimensional geometric shapes without a model (circle, triangle, rectangle/square).	19, 46, 89	
		Level II AA Students will: EE7.G.1-2. Demonstrate the ability to complete a two-dimensional shape (circle, triangle, rectangle, square).	19, 12, 21	
7.G.3. Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	EE7.G.3. Match a two-dimensional shape with a three-dimensional shape that shares an attribute.	Level I AA Students will: EE7.G.1-2. Demonstrate the ability to recognize a two-dimensional shape (circle, triangle, rectangle, square) when given a complete shape. Ex. Recognize a shape.	19, 6 12, 21	7
		Level IV AA Students will: EE7.G.3. Pair two- and three-dimensional shapes to complete a real-world task.		

Seventh Grade Mathematics Standards: Geometry				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level III AA Students will: EE7.G.3. Match a two-dimensional shape with a three-dimensional shape that shares an attribute.	91, 100	
		Level II AA Students will: EE7.G.3. Identify the attributes of a three-dimensional shape (color, number of sides, faces, size, textures, shape, etc.).	53, 91	
		Level I AA Students will: EE7.G.3. Replicate the two-dimensional cross-section of a three-dimensional shape (cube, sphere, cylinder) when given a complete shape. Ex. Given a cube, outline the base to form a square.	21, 19 6, 12	
Solve real-life and mathematical problems involving angle measure, area, surface area, and volume				
7.G.4. 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.	EE7.G.4. N/A			
7.G.5. 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.	EE7.G.5. Find the perimeter of a rectangle given the length and width.	Level IV AA Students will: EE7.G.5. Solve simple perimeter problems with rectangles.		
		Level III AA Students will: EE7.G.5. Find the perimeter of a rectangle given the length and width.	114, 81	
		Level II AA Students will: EE7.G.5. Identify the length and width of a rectangle.	59, 36	7
		Level I AA Students will: EE7.G.5. Outline the perimeter of an object.	6, 12 59, 21	7
7.G.6. 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.	EE7.G.6. Find the area of a rectangle given the length and width using a model.	Level IV AA Students will: EE7.G.6. Solve simple area problems with rectangles.		
		Level III AA Students will: EE7.G.6. Find the area of a rectangle given the length and width using a model.	114, 116	
		Level II AA Students will: EE7.G.6. Identify the length and width (dimensions) of a rectangle.	59, 60, 61	7
		Level I AA Students will: EE7.G.6. Duplicate the area of a rectangle (square).	6, 12, 59	7

Eighth Grade Mathematics Standards: Geometry				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Understand congruence and similarity using physical models, transparencies, or geometry software.				
<p>8.G.1. Verify experimentally the properties of rotations, reflections, and translations:</p> <p>a. Lines are taken to lines, and line segments to line segments of the same length.</p> <p>b. Angles are taken to angles of the same measure.</p> <p>c. Parallel lines are taken to parallel lines.</p>	<p>EE8.G.1-3. Identify similarity and congruence (same) in objects and shapes containing angles without translations.EE8.G.1-3. Identify similarity and congruence (same) in objects and shapes containing angles without translations.</p>	<p>Level IV AA Students will:</p> <p>EE8.G.1-3. N/A</p>		
<p>8.G.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.</p>		<p>Level III AA Students will:</p> <p>EE8.G.1-3. Identify similarity and congruence (same) in objects and shapes containing angles without translations.</p>	91, 100, 89	
<p>8.G.3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</p>		<p>Level II AA Students will:</p> <p>EE8.G.1-3. Match similar shapes.</p>	19	7
		<p>Level I AA Students will:</p> <p>EE8.G.1-3. Match shapes using a three-dimensional object.</p>	6, 12, 19	7
<p>8.G.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.</p>	<p>EE8.G.4. Identify similar shapes with and without rotation.</p>	<p>Level IV AA Students will:</p> <p>EE8.G.4. Determine if geometric shapes are similar with rotations or reflections.</p>	89, 91, 100	
		<p>Level III AA Students will:</p> <p>EE8.G.4. Identify similar shapes with and without rotation.</p>	89, 91, 100	
		<p>Level II AA Students will:</p> <p>EE8.G.4. Identify similar geometric shapes.</p>	19	7
		<p>Level I AA Students will:</p> <p>EE8.G.4. Recognize geometric shapes.</p>	6, 12, 19	7
<p>8.G.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.</p>	<p>EE8.G.5. Compare measures of angles to a right angle (greater than, less than, or equal to).</p>	<p>Level IV AA Students will:</p> <p>EE8.G.5. Compare measures of angles formed by intersecting lines.</p>		

Eighth Grade Mathematics Standards: Geometry				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level III AA Students will: EE8.G.5. Compare measures of angles to a right angle (greater than, less than, or equal to).		
		Level II AA Students will: EE8.G.5. Recognize a right angle.		
		Level I AA Students will: EE8.G.5. Recognize an angle.	19, 6 12, 11	
Understand and apply the Pythagorean Theorem.				
8.G.6. Explain a proof of the Pythagorean Theorem and its converse.	EE8.G.6-8. N/A			
8.G.7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.				
8.G.8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.				
Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.				
8.G.9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	EE8.G.9. Identify volume of common measures (cups, pints, quarts, gallons, etc.).	Level IV AA Students will: EE8.G.9. Apply knowledge of volume.		
		Level III AA Students will: EE8.G.9. Identify volume of common measures (cups, pints, gallons, etc.).	82, 114, 115	
		Level II AA Students will: EE8.G.9. Identify which is more or less?	61	
		Level I AA Students will: EE8.G.9. Experience volume.	6, 12 10, 11	7
High School Mathematics Standards: Geometry - Congruence				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Experiment with transformations in the plane.				
G.CO.1. 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.	EEG-CO.1. Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles.	Level IV AA Students will: EEG-CO.1. Compare attributes of perpendicular lines, parallel lines, line segments, angles, and circles.		

High School Mathematics Standards: Geometry - Congruence				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level III AA Students will: EEG-CO.1. Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles.		
		Level II AA Students will: EEG-CO.1. Know the attributes of lines, circles, and angles with equivalent measure.	21, 91, 100	
		Level I AA Students will: EEG-CO.1. Identify a line and a shape (i.e. circle, square, triangle).	19, 10, 11	7
G-CO.2. 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).	EEG-CO.2. N/A			
G-CO.3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	EEG-CO.3. N/A			
G-CO.4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	EEG-CO.4-5. Identify rotations, reflections, and slides.	Level IV AA Students will:		
G-CO.5. 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.		EEG-CO.4-5. Demonstrate what happens when a figure is transformed. Ex. Show a rotation using an object.		
		Level III AA Students will: EEG-CO.4-5. Identify rotations, reflections, and slides.		
		Level II AA Students will: EE.G-CO.4-5. Recognize rotation, reflection, or slide (key terms, vocabulary, and movement).	82, 36	
		Level I AA Students will: EEG-CO.4-5. Attend to movement demonstrating rotations, reflections, and slides.	6, 12	7

High School Mathematics Standards: Geometry - Congruence					
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines	
Understand congruence in terms of rigid motions					
G-CO.6. 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.	EEG-CO.6-8. Identify corresponding congruent (the same) parts of shapes.	Level IV AA Students will: EEG-CO.6-8. Demonstrate why shapes are congruent.			
G-CO.7. 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.					
G-CO.8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.		Level III AA Students will: EEG-CO.6-8. Identify corresponding congruent (the same) parts of shapes.	91, 100, 109		
		Level II AA Students will: EEG-CO.6-8. Recognize congruent parts (angles and sides).	91		
		Level I AA Students will: EEG-CO.6-8. Recognize shapes that are congruent.	19, 6, 12		
Prove geometric theorems					
G-CO.9. Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.	EEG-CO.9-11. N/A				
G-CO.10. Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.					
G-CO.11. Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.					

High School Mathematics Standards: Geometry - Congruence				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Make geometric constructions				
G-CO.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.	EEG-CO.12-13. N/A			
G-CO.13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.				
High School Mathematics Standards: Geometry - Similarity, Right Triangles, and Trigonometry				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Understand similarity in terms of similarity transformations				
	EEG-SRT.1-3. N/A (See EEG-CO.6-8.)			
G-SRT.1. Verify experimentally the properties of dilations given by a center and a scale factor: <ul style="list-style-type: none"> • A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. • A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. • The dilation of a line segment is longer or shorter in the ratio given by the scale factor. 				
G-SRT.2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.				
G-SRT.3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.				

High School Mathematics Standards: Geometry - Similarity, Right Triangles, and Trigonometry

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<i>Prove theorems involving similarity</i>				
G-SRT.4. Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.	EEG-SRT.4-5. N/A			
G-SRT.5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.				
<i>Define trigonometric ratios and solve problems involving right triangles</i>				
G-SRT.6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	EEG-SRT.6-8. N/A			
G-SRT.7. Explain and use the relationship between the sine and cosine of complementary angles.				
G-SRT.8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.				

High School Mathematics Standards: Geometry - Circles

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<i>Understand and apply theorems about circles</i>				
G-C.1. Prove that all circles are similar.	EEG-C.1-3. N/A			
G-C.2. Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.				
G-C.3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.				

High School Mathematics Standards: Geometry - Circles				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Find arc lengths and areas of sectors of circles				
G-C.5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	EEG-C.5. N/A			
High School Mathematics Standards: Geometry - Expressing Geometric Properties with Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Translate between the geometric description and the equation for a conic section				
G-GPE.1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	EEG-GPE.1. N/A			
G-GPE.2. Derive the equation of a parabola given a focus and directrix. Use coordinates to prove simple geometric theorems algebraically.	EEG-GPE.2-4. N/A			
G-GPE.4. Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.	EEG-GPE.4. N/A (See EEG- GPE)			
G-GPE.5. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	EEG-GPE.5-6. N/A (See EEG.CO.1)			
G-GPE.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.				
G-GPE.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	EEG-GPE.7. Find perimeter and area of squares and rectangles to solve real-world problems.	Level IV AA Students will: EEG-GPE.7. Use formulas to find perimeter and area of squares and rectangles to solve real-world problems.		
		Level III AA Students will: EEG-GPE.7. Find perimeter and area of squares and rectangles to solve real-world problems.		

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

High School Mathematics Standards: Geometry - Expressing Geometric Properties with Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level II AA Students will: EEG-GPE.7. Find perimeter or area by counting on a grid.	59, 60 61, 21	
		Level I AA Students will: EEG-CPE.7. Identify inside, around, and outside of a closed figure.	6, 12 15, 16	7
High School Mathematics Standards: Geometry - Geometric Measurement and Dimension				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Explain volume formulas and use them to solve problems				
G-GMD.1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.	EEG-GMD.1-3. Make a prediction based on knowledge of volume to identify volume of common containers (cups, pints, gallons, etc.).	Level IV AA Students will: EEG-GMD.1-3. Apply knowledge of volume to make appropriate volumetric estimates.		
G-GMD.3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.		Level III AA Students will: EEG-GMD.1-3. Make a prediction based on knowledge of volume to identify volume of common containers (cups, pints, gallons, etc.).	98, 105	
		Level II AA Students will: EEG-GMD.1-3. Which is more or less?	59, 60 61, 56	
		Level I AA Students will: EEG-GMD.1-3. Experience volume.	6, 12 10, 11	7
Visualize relationships between two-dimensional and three-dimensional objects				
G-GMD.4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	EEG-GMD.4. Distinguish between two-dimensional and three-dimensional objects to solve real-world problems.	Level IV AA Students will: EEG-GMD.4. Use the properties of two-dimensional and three-dimensional objects to solve real-world problems.		
		Level III AA Students will: EEG-GMD.4. Distinguish between two-dimensional and three-dimensional objects to solve real-world problems.		
		Level II AA Students will: EEG-GMD.4. Distinguish between two-dimensional and three-dimensional	86	
		Level I AA Students will: EEG-GMD.4. Identify two-dimensional shapes.	19, 6, 12	

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

High School Mathematics Standards: Geometry - Modeling with Geometry				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Apply geometric concepts in modeling situations				
<p>G-MG.1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).</p>	<p>EEG-MG.1-3. Use properties of geometric shapes to describe real-life objects.</p>	<p>Level IV AA Students will: G-MG.1-3. Apply geometric methods to solve design problems.</p>		
<p>G-MG.2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).</p>				
<p>G-MG.3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).</p>		<p>Level III AA Students will: EEG-MG.1-3. Use properties of geometric shapes to describe real-life objects.</p>	<p>91, 100, 109</p>	
		<p>Level II AA Students will: EEG-MG.1-3. Identify geometric shapes.</p>	<p>19, 53</p>	
		<p>Level I AA Students will: EEG-MG.1-3. Compare the capacity of three-dimensional objects.</p>	<p>6, 12 11, 19</p>	<p>7</p>

Sixth Grade Mathematics Standards: Ratios and Proportional Relationships				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Understand ratio concepts and use ratio reasoning to solve problems				
<p>6.RP.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."</p>	<p>EE6.RP.1. Demonstrate a simple ratio relationship.</p>	<p>Level IV AA Students will: EE6.RP.1. Use a ratio to describe a relationship using numbers and objects. Ex. Given an even number of red and twice as many green beads, identify the ratio of green beads compared to red beads.</p>		
<p>6.RP.2. Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger." 17</p>		<p>Level III AA Students will: EE6.RP.1. Demonstrate a simple ratio relationship.</p>		
		<p>Level II AA Students will: EE6.RP.1. Complete a pattern given a simple ratio.</p>		
<p>6.RP.3. Use ratio and rate reasoning to solve real- world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.</p> <p>• 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. 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? 100 (e.g., 30% of a quantity means $30/100$ times the quantity); solve problems involving finding the whole, given a part and the percent. multiplying or dividing quantities.</p>		<p>Level I AA Students will: EE6.RP.1. Identify a one-to-one relationship.</p>	7, 8 9, 61	7, 10, 16

Seventh Grade Mathematics Standards: Ratios and Proportional Relationships				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Analyze proportional relationships and use them to solve real-world and mathematical problems.				
7.RP.1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.	EE7.RP.1-3. Use a ratio to model or describe a relationship.	Level IV AA Students will: EE7.RP.1-3. Complete the ratio using numbers to show relationships.		
7.RP.2. Recognize and represent proportional relationships between quantities. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn. 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.		Level III AA Students will: EE7.RP.1-3. Use a ratio to model or describe a relationship.		
		Level II AA Students will: EE7.RP.1-3. Demonstrate a simple ratio relationship.		
7.RP.3. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.		Level I AA Students will: EE7.RP.1-3. Identify one item as it relates to another.	6, 114	7, 10, 16

Sixth Grade Mathematics Standards: The Number System				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Apply and extend previous understandings of multiplication and division to divide fractions by fractions				
6.NS.1. 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. For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb. of chocolate equally? How many $3/4$ -cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi? Compute fluently with multi-digit numbers and find common factors and multiples.	EE6.NS.1. Compare the relationships between two unit fractions.	Level IV AA Students will: EE6.NS.1. Compare the relationships between the three unit fractions ($1/2$, $1/4$, $1/8$).		
Compute fluently with multi-digit numbers and find common factors and multiples				
		Level III AA Students will: EE6.NS.1. Compare the relationships between two unit fractions.		
		Level II AA Students will: EE6.NS.1. Demonstrate an amount of $1/2$.		
		Level I AA Students will: EE6.NS.1. Distinguish between more or less.	6, 100	7, 10, 15
6.NS.2. Fluently divide multi-digit numbers using the standard algorithm.	EE6.NS.2. Apply the concept of fair share and equal shares to divide.	Level IV AA Students will: EE6.NS.2. Solve a division problem using the concept of equal shares. Ex. Given a real-life division problem, solve the problem using manipulatives.		
		Level III AA Students will: EE6.NS.2. Apply the concept of fair share and equal shares to divide.		
		Level II AA Students will: EE6.NS.2. Identify the concept of division using fair and equal shares.	89, 100 109, 116	7, 10, 41
		Level I AA Students will: EE6.NS.2. Replicate equal sets.	4, 6, 7 10, 59, 61	7, 10, 16
6.NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	EE6.NS.3. Solve two factor multiplication problems with products up to 50 using concrete objects and/or calculators.	Level IV AA Students will: EE6.NS.3. Solve multiplication problems with whole number products to 50 using numerical representations. (e.g., If I have three shirts and two pair of pants how many outfits can one make? If I have five rows of desks and 10 desks in each row, how many desks will I have? If I babysat for five days and earned 10 dollars each day how much money would I make?).		

Sixth Grade Mathematics Standards: The Number System				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level III AA Students will: EE6.NS.2. Solve two factor multiplication problems with products up to 50 using concrete objects and/or calculators.		
		Level II AA Students will: EE6.NS.2. Solve repeated addition problems where the addends are the same (i.e., $5 + 5 + 5 = 15$ is equal to three groups of five) using concrete manipulatives and/or a calculator.		
		Level I AA Students will: EE6.NS.2. Identify a group of a given quantity.	20, 59, 60 61, 62	7, 10, 16
6.NS.4. 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. For example, express $36 + 8$ as whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express $36 + 8$ as $4(9 + 2)$.	EE6.NS.4. N/A			
Apply and extend previous understandings of numbers to the system of rational numbers				
6.NS.5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	EE6.NS.5-8. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero).	Level IV AA Students will: EE6.NS.5-8. Apply positive and negative numbers to a real-world context from greater than positive 10 and less than negative 10.		
		Level III AA Students will: EE6.NS.5-8. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero). positive or negative balance (do you have any money or do you owe the bank money?).		

Sixth Grade Mathematics Standards: The Number System				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<p>6.NS.6. Understand a rational number as a point on the number line. 6.NS.6. 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.</p> <ul style="list-style-type: none"> 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. 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. 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. 		<p>Level II AA Students will: EE6.NS.5-8. Order positive numbers from least to greatest.</p>	59, 60	7, 10, 41
		<p>Level I AA Students will: EE6.NS.5-8. Identify which is greater than and less than using fewer than 10</p>	6, 11 20, 61	7, 8, 16

Sixth Grade Mathematics Standards: The Number System				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<p>6.NS.7. Understand ordering and absolute value of rational numbers. statements about the relative position of two numbers on a number line diagram. For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.</p> <ul style="list-style-type: none"> • Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write $-30^{\circ}\text{C} > -70^{\circ}\text{C}$ to express the fact that -30°C is warmer than -70°C. • 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. For example, for an account balance of -30 dollars, write $-30 = 30$ to describe the size of the debt in dollars. • Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars. 				
<p>6.NS.8. 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.</p>				

Seventh Grade Mathematics Standards: The Number System					
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines	
Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers					
<p>7.NS.1. 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 diagram.</p> <ul style="list-style-type: none"> • Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged. • 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. • Understand $p - q$ as the sum of p and the additive inverse of q. Interpret differences of rational numbers as the absolute value of their difference, and apply this principle in real-world contexts. 	<p>EE7.NS.1. Add fractions with like denominators (halves, thirds, fourths, and tenths) so the solution is less than or equal to one.</p>	<p>Level IV AA Students will: EE7.NS.1. Same as Level III AA Students.</p>			
			<p>Level III AA Students will: EE7.NS.1. Add fractions with like denominators (halves, thirds fourths, and tenths) so the solution is less than or equal to one.</p>		
			<p>Level II AA Students will: EE7.NS.1. Use models to add halves, thirds, and fourths.</p>		
			<p>Level I AA Students will: EE7.NS.1. Use models to identify the whole and find the missing pieces of a whole.</p>	6, 7 9, 100	7, 10, 16

Seventh Grade Mathematics Standards: The Number System				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Apply properties of operations as strategies to add and subtract rational numbers				
<p>7.NS.2. Apply and extend previous understandings of 7.NS.2 multiplication and division and of fractions to multiply and divide rational numbers.</p> <ul style="list-style-type: none"> Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. Apply properties of operations as strategies to multiply and divide rational numbers. 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. 	<p>EE7.NS.2.a. Solve multiplication problems with products to 100</p>	<p>Level IV AA Students will: EE7.NS.2.a. Solve multiplication problems with products to 144.</p>		
		<p>Level III AA Students will: EE7.NS.2.a. Solve multiplication problems with products to 100.</p>		
		<p>Level II AA Students will: EE7.NS.2.a. Solve multiplication problems using factors 1 – 10.</p>		
		<p>Level I AA Students will: EE7.NS.2.a. Skip count by twos and tens. Ex. Model repeated addition.</p>	59, 61 114, 116	
		<p>EE7.NS.2.b. Solve division problems with divisors up to five and also with a divisor of 10 without remainders.</p>	<p>Level IV AA Students will: EE7.NS.2.b. Solve division problems with divisors up to 10 using numbers</p>	
		<p>Level III AA Students will: EE7.NS.2.b. Solve division problems with divisors up to five and also with a divisor of 10 without remainders.</p>		

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

Seventh Grade Mathematics Standards: The Number System				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level II AA Students will: EE7.NS.2.b. Determine how many times a number can be subtracted from an equally divisible number.		
		Level I AA Students will: EE7.NS.2.b. Associate value with the number one by recognizing the group/set that has more than one	59, 60, 61 62, 100	7, 10, 16
	EE7.NS.2.c-d. Compare fractions to fractions and decimals to decimals using rational numbers less than one.	Level IV AA Students will: EE8.NS.2.c-d. Compare and order fractions and decimals when all numbers are fractions or when all numbers are decimals or when fractions and decimals are mixed		
		Level III AA Students will: EE8.NS.2.c-d. Compare fractions to fractions and decimals to decimals using rationale numbers less than one.		
		Level II AA Students will: EE8.NS.2.c-d. Identify the location of a fraction or decimal used in the real world and/or on a number line.		
		Level I AA Students will: EE8.NS.2.c-d. Identify decimals or fractions.		
7.NS.3. Solve real-world and mathematical problems involving the four operations with rational numbers. ¹⁸	EE7.NS.3. Demonstrate the value of various money amounts using decimals.	Level IV AA Students will: EE7.NS.3. Determine the total value of money written as a decimal given real-world situations.		
		Level III AA Students will: EE7.NS.3. Demonstrate the value of various money amounts using decimals.		
		Level II AA Students will: EE7.NS.3. Identify the decimal value of various coins.		
		Level I AA Students will: EE7.NS.3. Identify money.	7, 9 61, 63	7, 10, 15

Sixth Grade Mathematics Standards: Expressions and Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Apply and extend previous understandings of arithmetic to algebraic expressions				
6.EE.1. Write and evaluate numerical expressions involving whole-number exponents.	EE6.EE.1-2. Identify equivalent number sentences.	Level IV AA Students will: EE6.EE.1. Generate a two-step math sentence using appropriate numbers and symbols.		
6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers. • Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as $5 - y$. • 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. For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms. a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.		Level III AA Students will: EE6.EE.1. Identify equivalent number sentences.		
		Level II AA Students will: EE6.EE.1. Match number sentence with the correct picture representation.	59, 61	7, 10
		Level I AA Students will: EE6.EE.1. Identify math symbol " $=$ " as meaning equal to.	18	7, 10
6.EE.3. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$. and $3y$ are equivalent because they name the same number regardless of which number y stands for. Reason about and solve one-variable equations and inequalities.	EE6.EE.3-4. Demonstrate understanding of equivalent expressions	Level IV AA Students will: EE6.EE.3-4. Solve equivalent expressions to illustrate that they are equivalent		

Sixth Grade Mathematics Standards: Expressions and Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level III AA Students will: EE6.EE.3-4. Demonstrate understanding of equivalent expressions.		
		Level II AA Students will: EE6.EE.3-4. Recognize different displays of the equal quantities.	59, 61 114, 116	7, 10, 27
		Level I AA Students will: EE6.EE.3-4. Match different displays of the same quantity.	8, 20, 58	7, 10, 16
Reason about and solve one-variable equations and inequalities				
6.EE.5. 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.	EE6.EE.5-7. Match an equation to a real-world problem in which variables are used to represent numbers.	Level IV AA Students will: EE6.EE.2. Using a variable, generate an equivalent equation that represents a real-world problem.		
6.EE.6. 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.		Level III AA Students will: EE6.EE.2. Match an equation to a real-world problem in which variables are used to represent numbers.		
6.EE.7. 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.		Level II AA Students will: EE6.EE.2. Determine what is unknown in an equation.		
6.EE.8. 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.		Level I AA Students will: EE6.EE.2. Identify the letter in a mathematical sentence.	18, 60, 115	7, 10

Sixth Grade Mathematics Standards: Expressions and Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Represent and analyze quantitative relationships between dependent and independent variables				
<p>6.EE.9. 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. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.</p>	EE6.EE.9. N/A			
Seventh Grade Mathematics Standards: Expressions and Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Use properties of operations to generate equivalent expressions				
<p>7.EE.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</p>	EE7.EE.1-2. Use the relationship within addition and/or multiplication to illustrate that two expressions are equivalent.	<p>Level IV AA Students will: EE7.EE.1-2. Apply the commutative property to complete an equation.</p>		
<p>7.EE.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. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."</p>		<p>Level III AA Students will: EE7.EE.1-2. Use the relationship within addition and/or multiplication to illustrate that two expressions are equivalent.</p>		
		<p>Level II AA Students will: EE7.EE.1-2. Use the relationship within addition to illustrate that two expressions are equivalent.</p>		
		<p>Level I AA Students will: EE7.EE.1-2. Understand that different displays of the same quantity are equal.</p>	20, 59, 61	7, 10, 16

Seventh Grade Mathematics Standards: Expressions and Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Solve real-life and mathematical problems using numerical and algebraic expressions and equations				
<p>7.EE.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. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.</p>	<p>EE7.EE.3-4. Use the concept of equality with models to solve one-step addition and subtraction equations.</p>	<p>Level IV AA Students will: EE7.EE.3-4. Solve two-step addition and subtraction equations.</p>		
		<p>Level III AA Students will: EE7.EE.3-4. Use the concept of equality with models to solve one-step addition and subtraction equations.</p>		
		<p>Level II AA Students will: EE7.EE.3-4. Identify the amount needed to equal the value on the given side of an equation.</p>		
		<p>Level I AA Students will: EE7.EE.3-4. Recognize equal quantities on both sides of an equation.</p>	7, 59 61, 114	7, 10, 16

Seventh Grade Mathematics Standards: Expressions and Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<p>7.EE.4. 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.</p> <ul style="list-style-type: none"> 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. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width? 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. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions. 				
Eighth Grade Mathematics Standards: The Number System				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Know that there are numbers that are not rational, and approximate them by rational numbers				
<p>8.NS.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.</p>	<p>EE8.NS.1. Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.</p>	<p>Level IV AA Students will: EE8.NS.1. Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends that may be greater than one.</p>		
		<p>Level III AA Students will: EE8.NS.1. Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.</p>		
		<p>Level II AA Students will: EE8.NS.1. Use models to subtract halves, thirds, and fourths.</p>		
		<p>Level I AA Students will: EE8.NS.1. Use models to identify the whole and find the missing pieces of a whole using halves.</p>	4, 7, 8	7, 10, 16

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

Eighth Grade Mathematics Standards: The Number System					
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines	
<p>8.NS.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, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations</p>	<p>EE8.NS.2. Represent different forms and values of decimal numbers using fractions with numerators that are multiples of five and a denominator of 100.</p>	<p>Level IV AA Students will: EE8.NS.2. Represent different forms and values of decimal numbers to the hundreds place (decimal, fraction, hundreds grid, and money representation).</p>			
		<p>Level III AA Students will: EE8.NS.2. Represent different forms and values of decimal numbers using fractions with numerators that are multiples of five and a denominator of 100</p>			
		<p>Level II AA Students will: EE8.NS.2. Distinguish between a part represented by a decimal and a whole number without decimals.</p>			
		<p>Level I AA Students will: EE8.NS.2. Identify a part of a whole in concrete real-world objects.</p>	4, 7, 8	7, 10, 16	
Eighth Grade Mathematics Standards: Expressions and Equations					
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines	
Expressions and Equations. Work with radicals and integer exponents					
<p>8.EE.1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.</p> <p>8.EE.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 rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.</p> <p>8.EE.3. Use numbers expressed in the form of a single digit times a whole- number 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 108 and the population of the world as 7 times 109, and determine that the world population is more than 20 times larger.</p>	<p>EE8.EE.1-4. Compose and decompose numbers to three digits.</p>	<p>Level IV AA Students will: EE8.EE.1-4. Use powers of 10 to compose and decompose numbers</p>			
		<p>Level III AA Students will: EE8.EE.1-4. Compose and decompose numbers to three digits.</p>			

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

Eighth Grade Mathematics Standards: Expressions and Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level II AA Students will: EE8.EE.1-4. Use models to represent the composition of numbers		
		Level I AA Students will: EE8.EE.1-4. Recognize the specific value a number represents.	58, 59 61, 62	7, 10, 16
8.EE.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.				
Understand the connections between proportional relationships, lines, and linear equations				
8.EE.5. Graph proportional relationships, 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.	EE8.EE.5-6. Graph a simple ratio using the x and y axis points when given the ratio in standard form (2:1) and convert to 2/1.	Level IV AA Students will: EE8.EE.5-6. Graph a simple ratio using the x and y axis points when given the ratio in standard form (2:1) and expand on the ratio by two or more points.		
8.EE.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 .		Level III AA Students will: EE8.EE.5-6. Graph a simple ratio using the x and y axis points when given the ratio in standard form (2:1) and convert to 2/1.		
		Level II AA Students will: EE8.EE.5-6. Identify a specific data point when given the coordinates. Ex. Read and plot coordinates on a map.		
		Level I AA Students will: EE8.EE.5-6. Place or locate data on a simple two-category graph.	6, 124	17, 33, 40

Eighth Grade Mathematics Standards: Expressions and Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Analyze and solve linear equations and pairs of simultaneous linear equations				
<p>8.EE.7. Solve linear equations in one variable.</p> <ul style="list-style-type: none"> • 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). 	<p>EE8.EE.7. Solve algebraic expressions using simple addition and subtraction.</p>	<p>Level IV AA Students will:</p> <p>8.EE.7. Solve algebraic expressions using two-digit addition and subtraction.</p>		
		<p>Level III AA Students will:</p> <p>EE8.EE.7. Solve algebraic expressions using simple addition and subtraction.</p>		
		<p>Level II AA Students will:</p> <p>EE8.EE.7. Solve simple addition and subtraction problems.</p>		
		<p>Level I AA Students will:</p> <p>EE8.EE.7. Distinguish between a letter and a number.</p>	20, 60, 115	29, 40, 47
<p>8.EE.8. Analyze and solve pairs of simultaneous linear equations. simultaneously.</p> <ul style="list-style-type: none"> • Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve 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. • 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. 	<p>EE8.EE.8. N/A (See EE.8.EE.5-6)</p>			

Sixth Grade Mathematics Standards: Statistics and Probability				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Develop understanding of statistical variability				
6.SP.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.	EE6.SP.1-2. Display data on a graph or table that shows variability in the data.	Level IV AA Students will: EE6.SP.1-2. Collect, display, and describe data on a graph or table.		
6.SP.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.		Level III AA Students will: EE6.SP.1-2. Display data on a graph or table that shows variability of data.		
		Level II AA Students will: EE6.SP.1-2. Organize data.		
		Level I AA Students will: EE6.SP.1-2. Sort information into categories of same and different.	4, 6, 7 8, 61, 100	7, 10, 16
6.SP.3. 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. 6.SP.3. 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.	EE6.SP.3. N/A			
Summarize and describe distributions				
6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots. 6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	EE6.SP.4. N/A (See EE6.SP.1-2)			

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

Sixth Grade Mathematics Standards: Statistics and Probability				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<p>6.SP.5. Summarize numerical data sets in relation to their context, such as by:6.SP.5. Summarize numerical data sets in relation to their context, such as by:</p> <ul style="list-style-type: none"> • Reporting the number of observations. • Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. • Giving 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. • 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. 	<p>EE6.SP.5. Summarize data distributions on a graph or table.</p>	<p>Level IV AA Students will: EE6.SP.5. Summarize the data on a graph or table</p>		
		<p>Level III AA Students will: EE6.SP.5. Summarize data distributions on a graph or table.</p>		
		<p>Level II AA Students will: EE6.SP.5. Use a graph to determine which category has the most.</p>		
		<p>Level I AA Students will: EE6.SP.5. Identify which has more or less.</p>	100	7, 10, 16
Seventh Grade Mathematics Standards: Statistics and Probability				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Use random sampling to draw inferences about a population				
<p>7.SP.1. 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.</p>	<p>EE7.SP.1-2. Answer a question related to the collected data from an experiment, given a model of data, or from data collected by the student.</p>	<p>Level IV AA Students will: EE7.SP.1-2. Answer a question about data collected from an experiment and explain or demonstrate the results.</p>		

Seventh Grade Mathematics Standards: Statistics and Probability				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<p>7.SP.2. 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. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.</p>		<p>Level III AA Students will: EE7.SP.1-2. Answer a question related to the collected data from an experiment, given a model of data, or from data collected by the student.</p>		
		<p>Level II AA Students will: EE7.SP.1-2. Collect data to answer a given question.</p>		
		<p>Level I AA Students will: EE7.SP.1-2. Answer a question for data collection.</p>	14, 16, 53 55, 105, 106	23, 16, 27
Draw informal comparative inferences about two populations				
<p>7.SP.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. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.</p>	<p>EE7.SP.3. Compare two sets of data within a single data display such as a picture graph, line plot, or bar graph.</p>	<p>Level IV AA Students will: EE7.SP.3. Compare data from two picture graphs, two line plots, or two bar graphs.</p>		
		<p>Level III AA Students will: EE7.SP.3. Compare two sets of data within a single data display such as a picture graph, line plot, or bar graph.</p>		
		<p>Level II AA Students will: EE7.SP.3. Summarize data on a graph or table in one way.</p>		
<p>7.SP.4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.</p>		<p>Level I AA Students will: EE7.SP.3. Read data from one given source.</p>	59, 62, 116	7, 10, 16

Seventh Grade Mathematics Standards: Statistics and Probability				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Investigate chance processes and develop, use, and evaluate probability models				
<p>7.SP.5. 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.</p>	<p>EE7.SP.5-7. Describe the probability of events occurring as possible or impossible.</p>	<p>Level IV AA Students will: EE7.SP.5-7. Differentiate and describe examples of a situation that is possible, a situation that is likely, and a situation that is impossible.</p>		
<p>7.SP.6. 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. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</p>		<p>Level III AA Students will: EE7.SP.5-7. Describe the probability of events occurring as possible or impossible.</p>		
		<p>Level II AA Students will: EE7.SP.5-7. Identify possible events that could occur in the natural environment.</p>	108, 113	37, 40, 46
		<p>Level I AA Students will: EE7.SP.5-7. Identify outcomes based on a possible event.</p>	45, 86, 94	7, 10, 13
<p>7.SP.7. 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.</p> <ul style="list-style-type: none"> Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected. model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies? 				

Eighth Grade Mathematics Standards: Statistics and Probability				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Investigate patterns of association in bivariate data				
8.SP.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.	EE8.SP.1-3. N/A			
8.SP.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.				
8.SP.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.				
8.SP.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?	EE8.SP.4. Construct a graph or table from given categorical data and compare data categorized in the graph or table.	Level IV AA Students will: EE8.SP.4. Conduct an experiment, collect data, and construct a graph or table.		
		Level III AA Students will: EE8.SP.4. Construct a graph or table from given categorical data and compare data categorized in the graph or table. watched by girls), answer questions to compare the habits of each.		
		Level II AA Students will: EE8.SP.4. Collect and organize data.	114, 116	7, 10, 27
		Level I AA Students will: EE8.SP.4. Organize data into groups.	59, 61	7, 10, 16

High School Mathematics Standards: Statistics and Probability - Interpreting Categorical and Quantitative Data

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Summarize, represent, and interpret data on a single count or measurement variable				
S-ID.1. Represent data with plots on the real number line (dot plots, histograms, and box plots).	EES-ID.1-2. Given data, construct a simple graph (table, line, pie, bar, or picture) and answer questions about the data.	Level IV AA Students will: EES-ID.1-2. Collect and organize data in simple graphs and use findings to draw conclusions from the data.		
S-ID.2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.		Level III AA Students will: EES-ID.1-2. Given data, construct a simple graph (table, line, pie, bar, or picture) and answer questions about the data.		
		Level II AA Students will: EES-ID.1-2. Given a graph, answer simple questions.		
		Level I AA Students will: EES-ID.1-2. Identify any part of a simple graph.	18, 60 91, 100	7, 10, 16
S-ID.3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	EES-ID.3. Indicate general trends on a graph or chart.	Level IV AA Students will: EES-ID.3. Extend a graph or chart to make a prediction.		
		Level III AA Students will: EES-ID.3. Indicate general trends on a graph or chart.		
		Level II AA Students will: EES-ID.3. Demonstrate increase and decrease over time.		
		Level I AA Students will: EES-ID.3. Determine categories needed on a graph.	61, 114	7, 10, 16
S-ID.4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	EES-ID.4. Calculate the mean of a given data set (limit data points to less than five).	Level IV AA Students will: EES-ID.4. Calculate the mean of a given data set (more than five data points).		
		Level III AA Students will: EES-ID.4. Calculate the mean of a given data set (limit data points to less than five).		
		Level II AA Students will: EES-ID.4. Identify the average between two consecutive numbers.		
		Level I AA Students will: EES-ID.4. Identify the missing number between two data points.	20, 59, 60	7, 10, 16

High School Mathematics Standards: Statistics and Probability - Interpreting Categorical and Quantitative Data

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Summarize, represent, and interpret data on two categorical and quantitative variables				
S-ID.5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	EES-ID.5. N/A (See EEF-IF.1. and EEA-REI.6-7)			
S-ID.6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.				
Interpret linear models				
S-ID.7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	EES-ID.7. N/A (See EEF-IF.4- 6)			
S-ID.8. Compute (using technology) and interpret the correlation coefficient of a linear fit.	EES-ID.8-9. N/A			
S-ID.9. Distinguish between correlation and causation.				

High School Mathematics Standards: Statistics and Probability - Making Inferences and Justifying Conclusions

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Understand and evaluate random processes underlying statistical experiments				
S-IC.1. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	EES-IC.1-2. Determine the likelihood of an event occurring when the outcomes are equally likely to occur.	Level IV AA Students will: EES-IC.1-2. Determine the likelihood of an event occurring when the outcomes are not equally likely to occur. yellow marbles. What is the probability of choosing a white marble?		

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

High School Mathematics Standards: Statistics and Probability - Making Inferences and Justifying Conclusions

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<p>S-IC.2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?</p>				
		<p>Level III AA Students will: EES-IC.1-2. Determine the likelihood of an event occurring when the outcomes are equally likely to occur.</p>		
		<p>Level II AA Students will: EES-IC.1-2. Determine the possible outcomes of an event occurring.</p>		
		<p>Level I AA Students will: EES-IC.1-2. Identify one event or outcome of an event occurring.</p>	43, 47, 83 102, 108	7, 10, 23

Make inferences and justify conclusions from sample surveys, experiments, and observational studies

<p>S-IC.3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.</p>	<p>EES-IC.3-6. N/A (See EES- ID.1-2)</p>			
<p>S-IC.4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.</p>				
<p>S-IC.5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.</p>				
<p>S-IC.6. Evaluate reports based on data.</p>				

High School Mathematics Standards: Statistics and Probability - Conditional Probability and the Rules of Probability

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<i>Understand independence and conditional probability and use them to interpret data</i>				
<p>S-CP.1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).</p>	<p>EES-CP.1-4. Identify when events are independent or dependent.</p>	<p>Level IV AA Students will: EES-CP.1-4. Find the probability of an event after another event has occurred.</p>		

High School Mathematics Standards: Statistics and Probability - Conditional Probability and the Rules of Probability

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
S-CP.2. Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.				
S-CP.3. Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.				
S-CP.4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.				
		Level III AA Students will: EES-CP.1-4. Identify when events are independent or dependent.		
		Level II AA Students will: EES-CP.1-4. Identify the outcomes of an event.		
		Level I AA Students will: EES-CP.1-4. Determine which event occurs first in a sequence.	43, 47, 83 102, 108	7, 10, 23
S-CP.5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.				
Use the rules of probability to compute probabilities of compound events in a uniform probability model				
S-CP.6. Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.	EES-CP.6-7. N/A (See EES- IC.1-2)			

High School Mathematics Standards: Statistics and Probability - Conditional Probability and the Rules of Probability

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
S-CP.7. Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.				

Eighth Grade Mathematics Standards: Functions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Define, evaluate, and compare functions				
8.F.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. ¹⁹	EE8.F.1-3. Given a function table, identify the missing number.	Level IV AA Students will: EE8.F.1-3. Given a function table, identify the rule and express the rule for the missing variable (e.g., n times 2).		
8.F.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, determine which function has the greater rate of change.		Level III AA Students will: EE8.F.1-3. Given a function table, identify the missing number.		
		Level II AA Students will: EE8.F.1-3. Identify the relationship between two numbers.	91, 110, 117	7, 10, 26
8.F.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.		Level I AA Students will: EE8.F.1-3. Given a sequence, match the element of a sequence. Ex. Given the sequence 1, 2, 1, 2 and a 1, match to number 1.	8, 18 20, 60	7, 10, 16
Use functions to model relationships between quantities				
8.F.4. Construct a function 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.	EE8.F.4. Determine the values or rule of a function using a graph or a table.	Level IV AA Students will: EE8.F.4. Given the input values and a rule, complete the output.		
		Level III AA Students will: EE8.F.4. Determine the values or rule of a function using a graph or a table.		
		Level II AA Students will: EE8.F.4. Navigate, read, use, or apply a graph or table. Ex. Given a set of coordinates, locate on a graph.		
		Level I AA Students will: EE8.F.4. Identify the different parts of a graph or a table.	18, 20	7, 10, 16

Eighth Grade Mathematics Standards: Functions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<p>8.F.5. 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.</p>	<p>EE8.F.5. Describe how a graph represents a relationship between two quantities.</p>	<p>Level IV AA Students will: EE8.F.5. Describe how a graph represents a relationship between two quantities and use the graph to answer questions using that relationship.</p>	4, 8, 18	7, 10, 16
		<p>Level III AA Students will: EE8.F.5. Describe how a graph represents a relationship between two quantities.</p>		
		<p>Level II AA Students will: EE8.F.5. Answer questions about data from a graph.</p>		
		<p>Level I AA Students will: EE8.F.5. Place data in a graph.</p>		
High School Mathematics Standards: Functions - Interpreting Functions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Understand the concept of a function and use function notation				
<p>F-IF.1. 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 $y = f(x)$.</p> <p>F-IF.2. Use function notations, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.</p> <p>F-IF.3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.</p>	<p>EEF-IF.1-3. Use the concept of function to solve problems.</p>	<p>Level IV AA Students will: EEF-IF.1-3. Use the concept of functions to identify how the two variables are affected.</p>		
		<p>Level III AA Students will: EEF-IF.1-3. Use the concept of function to solve problems.</p>		
		<p>Level II AA Students will: EEF-IF.1-3. Solve problems using a table that shows basic relationships (may not involve a true function).</p>		

High School Mathematics Standards: Functions - Interpreting Functions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level I AA Students will: EEF-IF.1-3. Identify basic information located on graphs.	18, 20 91, 100	7, 10, 16
Interpret functions that arise in applications in terms of the context				
F-IF.4. 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. Key features include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.	EEF-IF.4-6. Interpret rate of change (e.g., higher/lower, faster/slower).	Level IV AA Students will: EEF-IF.4-6. Evaluate key features of a graph (e.g. increasing, decreasing, constant.).		
F-IF.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.		Level III AA Students will: EEF-IF.4-6. Interpret rate of change (e.g. higher/lower, faster/slower).		
		Level II AA Students will: EEF-IF.4-6. Graph a simple linear equation represented by a table of values.		
		Level I AA Students will: EEF-IF.4-6. Read a table.	28, 73, 71 129, 153	7, 10, 40
F-IF.6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.				

High School Mathematics Standards: Functions - Interpreting Functions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Analyze functions using different representations				
<p>F-IF.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated technology for more complicated cases.</p> <p>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.</p> <p>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. cube root, and piecewise-defined functions, including step functions and absolute value functions.</p> <p>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.</p> <p>d. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.</p>	<p>EEF-IF.7. N/A (See EEF-IF.1- 3)</p>			
<p>F-IF.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.F-IF.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12t$, $y = (1.2)^t/10$, and classify them as representing exponential growth or decay.</p>	<p>EEF-IF.8. N/A</p>			

High School Mathematics Standards: Functions - Interpreting Functions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
F-IF.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and anF-IF.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.	EEF-IF.9. N/A			
High School Mathematics Standards: Functions - Building Functions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Build a function that models a relationship between two quantities				
F-BF.1. Write a function that describes a relationship between two quantities. <ul style="list-style-type: none"> Determine an explicit expression, a recursive process, or steps for calculation from a context. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. 	EEF-BF.1. Select the appropriate graphical representation (first quadrant) given a situation involving constant rate of change.	Level IV AA Students will: EEF-BF.1. Complete the appropriate graphical representation (first quadrant) given a situation involving constant rate of change.		
		Level III AA Students will: EEF-BF.1. Select the appropriate graphical representation (first quadrant) given a situation involving constant rate of change.		
		Level II AA Students will: EEF-BF.1. Select the appropriate graphical representation (first quadrant) given a situation involving constant rate of change where the difference is very clear.		
		Level I AA Students will: EEF-BF.1. Identify the terms in a sequence.	7, 8, 20, 61	7, 10, 16
F-BF.2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	EEF-BF.2. Build an arithmetic sequence when provided a recursive rule with whole numbers.	Level IV AA Students will: EEF-BF.2. Build an arithmetic sequence when provided a recursive rule with decreasing terms, decimals, or fractions.		
		Level III AA Students will: EEF-FB.2. Build an arithmetic sequence when provided a recursive rule with whole numbers.		

High School Mathematics Standards: Functions - Building Functions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level II AA Students will: EEF-BF.2. Identify a term in a sequence.	13, 20, 25 43, 60, 83	7, 10, 16
		Level I AA Students will: EEF-BF.2. Recognize a sequence.	25, 43, 83 85, 138	7, 8, 10 15, 26
Build new functions from existing functions				
F-BF.3. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	EEF-BF.3-4. N/A			
F-BF.4. Find inverse functions. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. For example, $f(x) = 2x^3$ or $f(x) = (x+1)/(x-1)$ for $x \neq 1$.				
High School Mathematics Standards: Functions - Linear, Quadratic, and Exponential Models				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Construct and compare linear, quadratic, and exponential models and solve problems				
F-LE.1. Distinguish between situations that can be modeled with linear functions and with exponential functions. <ul style="list-style-type: none"> • Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. • Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. • Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. 	EEF-LE.1. Model a simple linear function such as $y=mx$ to show functions grow by equal factors over equal intervals.	Level IV AA Students will: EEF-LE.1. Plot points using pictures in first quadrant on a graph using whole numbers and explain how y increases/decreases as x changes.		
		Level III AA Student will: EEF-LE.1. Model a simple linear function such as $y = mx$ to show functions grow by equal factors over equal intervals.		

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

High School Mathematics Standards: Functions - Linear, Quadratic, and Exponential Models				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level II AA Students will: EEF-LE.1. Identify a specific data point in the first quadrant and explain the meaning behind it.		
F-LE.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).		Level I AA Students will: EEF-LE.1. Interpret major ideas of a graph with linear functions.	18, 91, 100	7, 10
F-LE.3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.				
F-LE.4. For exponential models, express as a logarithm the solution to $abct = d$ where a , c , and d are numbers and the base b is 2, 10, or e ; evaluate the logarithm using technology.				
Interpret expressions for functions in terms of the situation they model				
F-LE.5. Interpret the parameters in a linear or exponential function in terms of a context.	EEF-LE.5. N/A			
High School Mathematics Standards: Functions - Trigonometric Functions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Extend the domain of trigonometric functions using the unit circle				
F-TF.1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	EEF-TF.1-2. N/A			
F-TF.2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.				
Model periodic phenomena with trigonometric functions				
F-TF.5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.	EEF-TF.5. N/A			

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

High School Mathematics Standards: Functions - Trigonometric Functions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<i>Prove and apply trigonometric identities</i>				
F-TF.8. Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.	EEF-TF.8. N/A			

High School Mathematics Standards: Number and Quantity - The Real Number System				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Extend the properties of exponents to rational exponents				
N-RN.1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5(1/3)^3$ to hold, so $(5^{1/3})^3$ must equal 5.	EEN-RN.1. Solve division problems with remainders using concrete objects.	Level IV AA Students will: EEN-RN.1. Illustrate concept of remainders using objects and numerical representations.		
		Level III AA Students will: EEN-RN.1. Solve division problems with remainders using concrete objects.		
		Level II AA Students will: EEN-RN.1. Identify the difference between equal and not equal groups.	59, 60 61, 116	7, 10
		Level I AA Students will: EEN-RN.1. Recognize that a whole can be divided into parts.	6, 19, 20	7, 10
N-RN.2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	EEN-RN.2. N/A			
Use properties of rational and irrational numbers				
N-RN.3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	EEN-RN.3. N/A			

High School Mathematics Standards: Number and Quantity - Quantities				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Reason quantitatively and use units to solve problems				
N-Q.1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	EEN-Q.1-3. Express quantities to the appropriate precision of measurement.	Level IV AA Students will: EEN-Q.1-3. Express solutions to problems using the appropriate precision of measurements.		
N-Q.2. Define appropriate quantities for the purpose of descriptive modeling.				
N-Q.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.				
		Level III AA Students will: EEN-Q.1-3. Express quantities to the appropriate precision of measurement.		
		Level II AA Students will: EEN-Q.1-3. Select the appropriate type of unit as a measurement tool.		
		Level I AA Students will: EEN-Q.1-3. Identify measurement tools. Identify the attribute to be measured (weight, length, and temperature).	6, 7, 8 10, 86	7, 10, 16
High School Mathematics Standards: Number and Quantity - The Complex Number System				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Perform arithmetic operations with complex numbers				
N-CN.1. Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.	EEN-CN.1. N/A			
N-CN.2. Use the relation i^2 distributive properties to add, subtract, and multiply complex numbers.	EEN-CN.2. Use the operations of addition, subtraction, and multiplication with decimals (decimal value \times whole number) in real world situations using money as the standard units (\$20, \$10, \$5, \$1, \$0.25, \$0.10, \$0.05, and \$0.01).	Level IV AA Students will: EEN-CN.2. Apply the operations of addition, subtraction, and multiplication in real world situations using money as the standard units (\$50, \$20, \$10, \$5, \$1, \$0.25, \$0.10, \$0.05, and \$0.01).	117	7, 10, 26
		Level III AA Students will: EEN-CN.2. Use the operations of addition, subtraction, and multiplication with decimals (decimal value \times whole number) in real-world situations using money as the standard units (\$20, \$10, \$5, \$1, \$0.25, \$0.10, \$0.05, and \$0.01).	63	7, 10, 26

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

High School Mathematics Standards: Number and Quantity - The Complex Number System				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level II AA Students will: EEN-CN.2. Use the operations of addition, subtraction, and multiplication up to the tenths place with decimals.	63	7, 10, 15
		Level I AA Students will: EEN-CN.2. Use the operations of addition, subtraction, multiplication, and multiplication with whole numbers less than 20.	6, 63	7, 10, 15
<i>Use complex numbers in polynomial identities and equations</i>				
N-CN.7. Solve quadratic equations with real coefficients that have complex solutions.	EEN-CN.7. N/A			

High School Mathematics Standards: Algebra - Seeing Structure in Expressions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Interpret the structure of expressions				
<p>A-SSE.1. Interpret expressions that represent a quantity in terms of its context.</p> <ul style="list-style-type: none"> Interpret parts of an expression, such as terms, factors, and coefficients. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P. 	<p>EEA-SSE.1. Match an algebraic expression involving one operation to represent a given word expression with an illustration.</p>	<p>Level IV AA Students will:</p> <p>EEA-SSE.1. Write or match an algebraic expression for a given word expression involving more than one operation.</p>		
		<p>Level III AA Students will:</p> <p>EEA-SSE.1. Match an algebraic expression involving one operation to represent a given word expression with an illustration.</p>		
		<p>Level II AA Students will:</p> <p>EEA-SSE.1. Identify the operation used for word expressions as indicated by an illustration.</p>		
		<p>Level I AA Students will:</p> <p>EEA-SSE.1. Recognize the symbol for an operation.</p>	6, 18	7, 10
<p>A-SSE.2. Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.</p>	<p>EEA-SSE.2. N/A</p>			
Write expressions in equivalent forms to solve problems				
<p>A-SSE.3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</p> <p>a. Factor a quadratic expression to reveal the zeros of the function it defines.</p> <p>b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.</p> <p>c. Use the properties of exponents to transform expressions for exponential functions. For example the expression $1.15t$ can be rewritten as $(1.151/12)^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.</p>	<p>EEA-SSE.3. Solve simple one-step equations (multiplication and division) with a variable.</p>	<p>Level IV AA Students will:</p> <p>EEA-SSE.3. Solve one-step equations (multiplication and division of two digits) with a variable.</p>		
		<p>Level III AA Students will:</p> <p>EEA-SSE.3. Solve simple one-step equations (multiplication and division) with a variable.</p>		
		<p>Level II AA Students will:</p> <p>EEA-SSE.3. Solve basic equations.</p>	114, 116, 117	7, 10, 15

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

High School Mathematics Standards: Algebra - Seeing Structure in Expressions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level I AA Students will: EEA-SSE.3. Identify quantity and match to the number. Ex.	6, 20, 59 60, 62, 63	7, 10, 15
A-SSE.4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.	EEA-SSE.4 Identify the missing part in any other equivalent ratio when given any ratio.	Level IV AA Students will: EEA-SSE.4. Find the missing components when given various ratios that form proportions.		
		Level III AA Students will: EEA-SSE.4. Identify the missing part in any other equivalent ratio when given any ratio.		
		Level II AA Students will: EEA-SSE.4. Identify the missing part in the next ratio using concrete objects when given a ratio (1:...).		
		Level I AA Students will: EEA-SSE.4. Identify or demonstrate a ratio relationship (See the recommendation for 6.RP.1 Level II).	6, 20, 59 60, 61, 62	7, 10, 16
High School Mathematics Standards: Algebra - Arithmetic with Polynomials and Rational Expressions				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Perform arithmetic operations on polynomials				
A-APR.1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	EEA-APR.1 N/A			
High School Mathematics Standards: Algebra - Creating Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Create equations that describe numbers or relationships				
A-CED.1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	EEA-CED.1. Solve an algebraic expression using subtraction.	Level IV AA Students will: EEA-CED.1. Solve an algebraic expression with more than one variable		
		Level III AA Students will: EEA-SSE.3. Solve an algebraic expression using subtraction.		
		Level II AA Students will: EEA-SSE.3. Solve simple equations with unknown/missing values (without variables).		

Relationship Between the Common Core Essential Elements and Links Lessons and Routines

High School Mathematics Standards: Algebra - Creating Equations				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
		Level I AA Students will: EEA-SSE.3. Identify what is unknown.	6, 12 20, 60	7, 10
A-CED.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. A-CED.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	EEA-CED.2-4. Solve one- step inequalities.	Level IV AA Students will:		
A-CED.3. Represent constraints by equations or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.in a modeling context.		EEA-CED.2-4. Solve two-step inequalities with a variable.		
A-CED.4. Rearrange formulas to highlight a quantity of interest, usingA-CED.4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm’s law $V = IR$ to highlight resistance R.		Level III AA Students will: EEA-CED.2-4. Solve one-step inequalities.		
		Level II AA Students will: EEA-CED.2-4. Verify the solution to an inequality with one variable.		
		Level I AA Students will: EEA-CED.2-4. Identify quantities that are greater than or less than a given quantity.	6, 12, 20 59, 60, 61	7, 8, 16
High School Mathematics Standards: Algebra - Reasoning with Equations and Inequalities				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Understand solving equations as a process of reasoning and explain the reasoning				
A-REI.1. Explain each step in solving a simple 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.	EEA-REI.1-2. N/A			
A-REI.2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.				

High School Mathematics Standards: Algebra - Reasoning with Equations and Inequalities				
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
Solve equations and inequalities in one variable				
A-REI.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	EEA-REI.3. N/A (See EEA- ECED.1-2.)			
A-REI.4. Solve quadratic equations in one variable. <ul style="list-style-type: none"> • Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. • Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. 				
Solve systems of equations				
A-REI.5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	EEA-REI.5. N/A			
A-REI.6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.				
A-REI.7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.	EEA-REI.6-7. N/A (See EEA- REI.10-12.)			
Represent and solve equations and inequalities graphically				
A-REI.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	EEA-REI.10.-12. Determine the two pieces of information that are plotted on a graph of an equation with two variables that form a line when plotted.	Level IV AA Students will: EEA-REI.10. Make a prediction using the graph of an equation with two variables that form a line when plotted using the trend of the line.		

High School Mathematics Standards: Algebra - Reasoning with Equations and Inequalities

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant Links Lessons	Relevant Links Routines
<p>A-REI.11. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</p>		<p>Level III AA Students will: EEA-REI.10. Determine the two pieces of information that are plotted on a graph of an equation with two variables that form a line when plotted.</p>		
<p>A-REI.12. 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.</p>		<p>Level II AA Students will: A-REI.10. Use a graph of two variables to find the answer to a real-world problem.</p>		
		<p>Level I AA Students will: A-REI.10. Identify major parts of a graph.</p>	<p>6, 14 16, 46</p>	<p>7, 10</p>

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