

ANNOTATED CURRICULUM FOR GRADE 6

The following is an annotated curriculum for teaching the Grade 6 Common Core State Standards (CCSS) for Math. Topics are presented in the sequence that they should be taught in the classroom rather than by Domain and Cluster. Links are provided for each standard that provide both lessons and problems.

Additionally, more general reference information is provided using the links below which teachers may wish to access for additional teaching techniques, subject content, audio-visual aids and materials for students. The list of tasks presented in no way implies that each math concept is a separate isolated topic or that each topic should only be taught only once.

Extensive Resources for every Domain, Cluster and Standard for Common Core Math for grade 6	http://ccssmath.org/?page_id=65
Video lessons for every 6th grade Domain, Cluster and Standard - an excellent source for teaching the grade 6 Common Core Standard	http://learnzillion.com/common_core/math/6
Thinking Block Modeling Tool	http://www.thinkingblocks.com/tb_modeling_tool/modeling_tool.html
6th Grade Common Core Math - Unpacked Content: The teaching tasks for each domain and cluster are provided. An example of what should be taught is provided in text and graphics for each task	http://www.dpi.state.nc.us/docs/acre/standards/common-core-tools/unpacking/math/6th.pdf
Lesson plans and extensive links for each Domain and Cluster (Utah Education Network).	http://www.uen.org/core/core.do?courseNum=5160
Example problems for each of the Common Core Standards	http://illustrativemathematics.org/illustrations?utf8=%E2%9C%93&search=6.&per_page=20&direction=&sort=
Common Core Standards and Sample Problems: Grade 6	http://www.mathscore.com/math/standards/Common%20Core/6th%20Grade/
IXL: Interactive games and lesson; large number of printables	http://www.ixl.com/promo?partner=google&phrase=display%20audiences%20banner&qclid=CJXt1OCFibMCFsmCQgodjCsAXA
Numerous activities for NS and RP standards	http://www.uen.org/Lessonplan/LPview.cgi?grade=6
Kahn Academy	http://www.khanacademy.org/
Common Core Math Standards for Grade 6 (pp 39 - 45)	http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

REFERENCES

	Buckle Down to the Common Core Standards - Grade 6, Triumph Learning, 2011
	Common Core Coach - Mathematics 6, Triumph Learning, 2013
	On Core Mathematics - Grade 6, Houghten Mifflin Harcourt, 2010
	8 - Step Model Drawing - Singapore's Best Problem Solving Math Strategies, Crystal Spring Books, 2007
	Common Core Mathematics, Practice at 3 Levels - Grade 6, Newmark Learning, 2012

No.	Math Concept	Standards and References
THE NUMBER SYSTEM		
<p>Students are expected to:</p> <ul style="list-style-type: none"> • Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • Compute fluently with multi-digit numbers and find common factors and multiples. • Apply and extend previous understandings of numbers to the system of rational numbers. 		
1	General Resources for Teaching the Number System	
	<ul style="list-style-type: none"> • Various Number System math skill games: 	http://mrnussbaum.com/stockshelves1/
2	Locate Integers on a Number line	6NS.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.
a.	<p>Locate positive and negative integers on horizontal and vertical number lines; locate zero</p> <ul style="list-style-type: none"> • Introduction to integers • Interactive number line • Find an integer on a number line; compare inequality of two integers • Comparison of Integers on a number line; problems • Games to teach the concept of positive and negative numbers • Short illustrated lesson on integers 	http://www.mathscore.com/math/skills/IntIntro.html http://www.mathsisfun.com/number-line.html http://illustrativemathematics.org/illustrations/283 http://www.mathscore.com/math/skills/CompInteger.html http://nrich.maths.org/6693 http://www.mansfieldschool.com/466735121153817/lib/466735121153817/Math_notes_3-7.pdf
b.	<p>Show the addition and subtraction of both positive and negative integers using a number line</p> <ul style="list-style-type: none"> • Interactive lesson on the addition and subtraction of positive and negative numbers • Understanding negative integers (YouTube 9:36) 	http://www.mathsisfun.com/positive-negative-integers.html http://www.khanacademy.org/math/arithmetic/addition-subtraction/v/negative-numbers-introduction

c.	<p>Use integers to describe real world situations</p> <ul style="list-style-type: none"> • Problems using positive and negative numbers to solve real world situations • Sea level problems using absolute value to determine magnitude • Using Integers to describe real life situations - Click on thumbnails to show examples 	<p>http://www.mathscore.com/math/skills/IntContext.html</p> <p>http://illustrativemathematics.org/illustrations/288</p> <p>http://www.teachersnotebook.com/product/Kbing522/using-integers-to-describe-real-life-situations-task-cards-ccs-6-ns-5</p>
d.	<p>Show keywords such as gained, increased and up indicate positive integers and that keywords such as decreased, down, less indicate negative integers</p> <ul style="list-style-type: none"> • Introduction to integers • Short illustrated lesson on integers 	<p>http://www.mathscore.com/math/skills/IntIntro.html</p> <p>http://www.mansfieldschool.com/466735121153817/lib/466735121153817/Math_notes_3-7.pdf</p>
3	<p>Locate Rational Numbers on a Number Line</p>	<p>6NS.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> <p>6NS.6a. 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.</p> <p>6NS.6.c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.</p>
a.	<p>Locate positive and negative rational numbers on horizontal and vertical number lines Locate zero</p> <ul style="list-style-type: none"> • Interactive lesson: Compare decimals on a number line • Compare integers, fractions and decimals on a number line 	<p>http://www.studyzone.org/mtestprep/math8/e/compdec6p.cfm</p> <p>http://staff.argyll.epsb.ca/jreed/math8/strand1/1102.htm</p>
b.	<p>Show that the opposite of a number is that number on the other side of 0 (i.e. that the opposite of a number is the number reflected across zero). Show that the opposite of the opposite of a number is the number itself</p> <ul style="list-style-type: none"> • Understand the opposite of a number by looking at a number line • Understand the opposites of decimal numbers by looking at a number line • Understand the opposite of fractions by looking at a number line 	<p>http://learnzillion.com/lessons/481-understand-the-opposite-of-a-number-by-looking-at-a-number-line</p> <p>http://learnzillion.com/lessons/482-understand-the-opposites-of-decimal-numbers-by-looking-at-a-number-line</p> <p>http://learnzillion.com/lessons/483-understand-the-opposites-of-fractions-by-looking-at-a-number-line</p>
c.	<p>Show the addition and subtraction of both positive and negative rational numbers using a number line</p> <ul style="list-style-type: none"> • Add and subtract rational numbers: The subtraction of rational numbers using the "take away concept" • Change subtraction to addition using the "additive inverse" 	<p>http://www.youtube.com/watch?v=9cSfAhHzNJw</p> <p>http://www.youtube.com/watch?v=A4mwo_g_2R4</p>

4	Absolute Numbers	<p>6NS.7. Understand ordering and absolute value of rational numbers.</p> <p>6NS.7.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. <i>For example, for an account balance of -30 dollars, write $-30 = 30$ to describe the size of the debt in dollars.</i></p> <p>6NS.7.d. 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>
a.	<p>Show the absolute value of both negative and positive rational numbers as the distance of the number from zero on a number line</p> <ul style="list-style-type: none"> Understanding the absolute value of a number as its distance from 0 on the number line Find absolute value using a number line 	<p>http://illustrativemathematics.org/illustrations/286</p> <p>http://learnzillion.com/lessons/1140-find-absolute-value-using-a-number-line</p>
b.	<p>Use the absolute value of numbers to describe real world situations</p> <ul style="list-style-type: none"> Interpret absolute value in real-world situations Above and below sea level 	<p>http://learnzillion.com/lessons/1143-interpret-absolute-value-in-realworld-situations</p> <p>http://illustrativemathematics.org/illustrations/288</p>
c.	<p>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> <ul style="list-style-type: none"> Understand absolute value and distinguish absolute value from statements about order 	<p>http://www.youtube.com/watch?v=SwwMU8Psgcg</p>
d.	<p>Relate the distance to the absolute value of a number above and below a zero level (i e both positive and negative numbers relative to a zero value)</p> <ul style="list-style-type: none"> Use a number line to understand how while the value of a negative number decreases, its absolute value increases 	<p>http://learnzillion.com/lessons/1144-use-a-number-line-to-understand-how-while-the-value-of-a-negative-number-decreases-its-absolute-value-increases</p>
5	Compare and Order Rational Numbers	<p>6NS.7.a. a. Interpret statements of inequality as 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> <p>6NS.7.b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ to express the fact that -3°C is warmer than -7°C.</p>
a.	<p>Use a number line to show the inequality of two or more rational numbers as their relative positions on a number line</p> <ul style="list-style-type: none"> Comparison of fractions on a number line Understand the relationship between two numbers using a number line 	<p>http://illustrativemathematics.org/illustrations/284</p> <p>http://learnzillion.com/lessons/1136-understand-the-relationship-between-two-numbers-using-a-number-line</p>
b.	<p>Show the inequality of two or more rational numbers in a real world situation</p> <ul style="list-style-type: none"> Comparing temperatures on a number line 	<p>http://illustrativemathematics.org/illustrations/285</p>

c.	<p>Compare rational numbers from greatest to least and least to greatest</p> <ul style="list-style-type: none"> • Compare more than two positive or negative numbers in real-world situations 	http://learnzillion.com/lessons/1139-compare-more-than-two-positive-or-negative-numbers-in-realworld-situations
6	The Co-ordinate Plane	<p>6NS.6.b. 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.</p> <p>6NS.6.c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.</p>
a.	<p>Plot x,y coordinates in all four quadrants according to the sign of x and y</p> <ul style="list-style-type: none"> • Graph points on a coordinate plane • Maze game for learning coordinates in 4 quadrants: • Game for Plotting data (drawing) in 4 quadrants: 	<p>http://learnzillion.com/lessons/490-graph-points-on-a-coordinate-plane</p> <p>http://www.shodor.org/interactivate/activities/MazeGame/</p> <p>http://www.themathlab.com/Pre-Algebra/graphing/hauntedhouse.htm</p>
b.	<p>Show that when two points differ only by the sign of their x and y coordinates, the points are reflections to each other across the x or y axis or both</p> <ul style="list-style-type: none"> • Reflect points over the x and y axes 	<p>http://learnzillion.com/lessons/492-reflect-points-over-the-x-and-y-axes</p>
7	Dividing Whole Numbers	6NS.2. Fluently divide multi-digit numbers using the standard algorithm.
a.	Assure students have fluency (automaticity) in dividing 2 digit integers by single digit integers - division fact worksheet	http://www.math-drills.com/division.shtml
b.	Review the procedure for dividing whole numbers	http://www.basic-mathematics.com/dividing-whole-numbers.html
c.	Identify the dividend, divisor and quotient	http://www.education.com/study-help/article/pre-algebra-help-division-whole-numbers/
8	Greatest Common Factor and Least Common Multiple	6NS.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. <i>For example, express $36 + 8$ as $4(9 + 2)$.</i>
a.	<p>Find multiples of a number</p> <ul style="list-style-type: none"> • Find multiples of a number; interactive test • Adding Multiples • Real world problem using multiples • Bake Sale - Distribute cookies using multiples 	<p>http://www.unclemath.com/what_is_multiples.php</p> <p>http://illustrativemathematics.org/illustrations/257</p> <p>http://illustrativemathematics.org/illustrations/259</p> <p>http://illustrativemathematics.org/illustrations/258</p>

b.	<p>Find the Greatest Common Factor (GCF) of 2 whole numbers less than or equal to 100</p> <ul style="list-style-type: none"> • Greatest Common Factor video (1:28) • Lesson on Greatest Common Factor 	<p>http://www.youtube.com/watch?v=guMCJ792UF0</p> <p>http://amby.com/educate/math/2-1_GCF.html</p>
c.	<p>Find the Least Common Multiple (LCM) of 2 whole numbers less than or equal to 12 using:</p> <ul style="list-style-type: none"> • The LCM using the common multiple of two numbers • Using Prime Numbers (Factor Box Method) 	<p>http://www.youtube.com/watch?v=cH-jaMCzIRk</p> <p>http://amphimath.com/</p>
d.	<p>Use the Distributive Property to show the sum of two numbers with a common factor is equal to a multiple of two numbers without a common factor</p> <ul style="list-style-type: none"> • Lesson on the Distributive Property • Interactive practice 	<p>http://www.khanacademy.org/math/arithmetic/number-properties/v/the-distributive-property</p> <p>http://www.ixl.com/math/grade-6/distributive-property</p>
<p>9 Adding and Subtracting Decimals 6NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p>		
a.	<p>Verify students can perform addition and subtraction operations using decimals with different numbers of place values in front of and behind the decimal point</p> <ul style="list-style-type: none"> • Worksheets 	<p>http://www.mathsisfun.com/worksheets/decimals.php</p>
<p>10 Multiplying and Dividing Decimals 6NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p>		
a.	<p>Teach students to multiply decimal numbers including techniques for assuring the correct placement of the decimal point in the product</p> <ul style="list-style-type: none"> • Decimal placement in decimal multiplication • Reasoning about Multiplication and Division and Place Value 	<p>http://illustrativemathematics.org/illustrations/275</p> <p>http://illustrativemathematics.org/illustrations/272</p>
b.	<p>Teach students to divide decimal numbers including the division of numbers containing one or more zeroes between non-zero numbers Assure the correct placement of the decimal point in the quotient</p> <ul style="list-style-type: none"> • Decimal placement in decimal division • Reasoning about Multiplication and Division and Place Value 	<p>http://illustrativemathematics.org/illustrations/275</p> <p>http://illustrativemathematics.org/illustrations/272</p>

11	Dividing Fractions	6NS.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. <i>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?</i>
a.	Use visual models to compute the quotients of fractions and solve word problems involving the division of fractions by fractions (including the division of integers by fractions and fractions by integers)	
	<p>LESSONS</p> <ul style="list-style-type: none"> • Introduction: Divide fractions by whole numbers using visual models. • Dividing fractions by fractions using visual models • Divide fractions by fractions: using the common denominator • Divide mixed numbers by fractions: using visual models. • Interpret remainders when dividing using visual models • Solve word problems involving division of fractions by whole numbers using picture models 	<p>http://learnzillion.com/lessons/203-divide-fractions-by-whole-numbers-using-models</p> <p>http://learnzillion.com/lessons/204-divide-fractions-by-fractions-using-models</p> <p>http://learnzillion.com/lessons/206-divide-fractions-by-fractions-using-the-common-denominator</p> <p>http://learnzillion.com/lessons/207-divide-mixed-numbers-by-fractions-using-models</p> <p>http://learnzillion.com/lessons/209-interpret-remainders-when-dividing-using-models</p> <p>http://learnzillion.com/lessons/1381-solve-word-problems-involving-division-of-fractions-by-whole-numbers-using-picture-models</p>
	<p>PROBLEMS</p> <ul style="list-style-type: none"> • Servings of rice - confusion between remainder and the fractional part of a mixed number answer • Drinking Juice 2 - Percent one fraction is of another • Fractions of distance 1 • Fractions of distance 2 • How many whole or fractional numbers are in another fractional or whole number? # 1 • How many whole or fractional numbers are in another fractional or whole number? #2 • One mug of hot chocolate uses $2/3$ cup of cocoa How many mugs can be made with 3 cups of cocoa powder? • Traffic problem involving the division of one fraction by another 	<p>http://illustrativemathematics.org/illustrations/463</p> <p>http://illustrativemathematics.org/illustrations/412</p> <p>http://illustrativemathematics.org/illustrations/410</p> <p>http://illustrativemathematics.org/illustrations/409</p> <p>http://illustrativemathematics.org/illustrations/692</p> <p>http://illustrativemathematics.org/illustrations/267</p> <p>http://illustrativemathematics.org/illustrations/407</p> <p>http://illustrativemathematics.org/illustrations/464</p>
b.	Use multiplication of the dividend by the reciprocal of the divisor to compute the quotients of fractions and solve word problems involving the division of fractions by fractions (including the division of integers by fractions and fractions by integers)	
	<ul style="list-style-type: none"> • Division of two fractions with common denominator • Interactive division of mixed numbers 	<p>http://illustrativemathematics.org/illustrations/330</p> <p>http://visualfractions.com/DivideEasy/dividelines.html</p>

RATIOS AND PROPORTIONAL RELATIONSHIPS

Students are expected to:

- Understand ratio concepts and use ratio reasoning to solve problems.

1	Ratios	<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>
a.	<p>Understand that a ratio is a relationship between two numbers in a specific order Show examples using the three different types of notation for ratios</p> <ul style="list-style-type: none"> • Detailed discussion of ratios (pages 1 - 2) • Part to Part and Part to Total ratios expressed as fractions • Definition, examples and problems • Multiple ratio problem • Interactive problems • Problem worksheets 	<p>http://www.purplemath.com/modules/ratio.htm</p> <p>http://learnzillion.com/lessons/584-understanding-ratios-and-fractions-by-analyzing-a-picture</p> <p>http://www.math.com/school/subject1/lessons/S1U2L1GL.html</p> <p>http://illustrativemathematics.org/illustrations/76</p> <p>http://www.webmath.com/k8ratio.html</p> <p>http://edhelper.com/ratios.htm</p>
2	Using Ratios to Solve Real World Problems	<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>
a.	<p>Use ratios to solve real-word problem Show examples using tables of equivalent ratios, tape diagrams and equations</p> <ul style="list-style-type: none"> • Solve ratio problems using a tape diagram • Solve ratio problems using bar diagrams • Solve ratio problems using tables and addition • Solve ratio problems using tables and multiplication • Determining whether to use a/b or b/a to calculate a unit rate • Multiple relationships • Rate, Time and Distance • Ratio and average problem • Percent of a lot that is not covered by a house 	<p>http://learnzillion.com/lessons/589-solve-ratio-problems-using-a-tape-diagram</p> <p>http://illustrativemathematics.org/illustrations/498</p> <p>http://learnzillion.com/lessons/586-solve-ratio-problems-using-tables-and-addition</p> <p>http://learnzillion.com/lessons/587-solve-ratio-problems-using-tables-and-multiplication</p> <p>http://illustrativemathematics.org/illustrations/77</p> <p>http://illustrativemathematics.org/illustrations/76</p> <p>http://illustrativemathematics.org/illustrations/193</p> <p>http://illustrativemathematics.org/illustrations/67</p> <p>http://illustrativemathematics.org/illustrations/118</p>

3	Ratios and Percents	6.RP.3.c. Find a percent of a quantity as a rate per 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.
a.	Define the percent of a quantity as the rate per 100 <ul style="list-style-type: none"> • Define percents as ratios 	http://learnzillion.com/lessons/593-define-percents-as-ratios
b.	Solve problems involving finding the whole, given a part and the percent Solve problems asking for the percent of the whole <ul style="list-style-type: none"> • Find the part when the percent and total are known • The whole from a fraction; the fraction from a ratio. • Discounts and original price - solve using a visual model • Find the total when the percent and part are known 	http://learnzillion.com/lessons/596-find-the-part-when-the-percent-and-total-are-known http://illustrativemathematics.org/illustrations/496 http://illustrativemathematics.org/illustrations/54 http://learnzillion.com/lessons/597-find-the-total-when-the-percent-and-part-are-known
c.	Determine the percent given a ratio in fractional or decimal form and a ratio given a percent <ul style="list-style-type: none"> • Price per pound and pounds per dollar • Ratios and percents • Applied percentage problem - Discounts 	http://illustrativemathematics.org/illustrations/549 http://learnzillion.com/lessons/593-define-percents-as-ratios http://illustrativemathematics.org/illustrations/54
4	Rates and Unit Rates	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." 6.RP.3.b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?
a.	Teach unit rates that are in the ratio a/b where the is one unit of b <ul style="list-style-type: none"> • Unit rate • Understand rates as a type of ratio 	http://illustrativemathematics.org/illustrations/274 http://learnzillion.com/lessons/839-understand-rates-as-a-type-of-ratio
b.	Solve Unit Rate Problems (including those involving unit pricing and constant speed) <ul style="list-style-type: none"> • Understand rates as a type of ratio • Solve rate and ratio word problems • Currency Exchange using unit rates • Worksheets - Solve rate and ratio word problems 	http://learnzillion.com/lessons/839-understand-rates-as-a-type-of-ratio http://learnzillion.com/lessons/314-solve-rate-and-ratio-word-problems http://illustrativemathematics.org/illustrations/134 http://edhelper.com/ratios.htm

5	Equivalent Ratios	6.RP.3.a. 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.
a.	Make tables of equivalent ratios involving whole number measurements Find missing values Use tables to compare ratios <ul style="list-style-type: none"> • Find equivalent ratios • Using a table to solve a ratio problem • Solve missing values in ratio problems using a table 	http://learnzillion.com/lessons/315-find-equivalent-ratios http://illustrativemathematics.org/illustrations/53 http://learnzillion.com/lessons/608-solve-missing-values-in-ratio-problems-using-a-table
b.	Plot the pairs of values from tables of equivalent ratios on the coordinate plain Make a line graph based on the coordinate pairs to show the relationship of variable a to variable b in a/b <ul style="list-style-type: none"> • Solve rate problems using multiplicative reasoning 	http://learnzillion.com/lessons/614-solve-rate-problems-using-multiplicative-reasoning
6	Converting Measurements	6.RP.3.d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
a.	Teach the conversion of one measurement into another using the ratio of the two measurements <ul style="list-style-type: none"> • Convert measurement units using ratio tables 	http://learnzillion.com/lessons/592-convert-measurement-units-using-ratio-tables

EXPRESSIONS AND EQUATIONS

Students are expected to:

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

1	Write Algebraic Expressions	6.EE.2.a. 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 $5 - y$ 6.EE.2.b. 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. 6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem.
a.	Write expressions in which letters stand for numbers <ul style="list-style-type: none"> • Read and write an algebraic expression containing a variable • Read and write algebraic expressions using parentheses 	http://learnzillion.com/lessons/465-read-and-write-an-algebraic-expression-containing-a-variable http://learnzillion.com/lessons/467-read-and-write-algebraic-expressions-using-parentheses
b.	Write a word and number phrase to represent an algebraic expressions Write an algebraic expression to represent words <ul style="list-style-type: none"> • Read and write algebraic expressions using parentheses 	http://learnzillion.com/lessons/467-read-and-write-algebraic-expressions-using-parentheses

2	Evaluate Algebraic Expressions	<p>6.EE.1. Write and evaluate numerical expressions involving whole-number exponents.</p> <p>6.EE.2.c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). 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 $s = 1/2$.</p> <p>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.</p> <p>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 $4(9 + 2)$.</p>
a.	Evaluate expression involving whole number exponents <ul style="list-style-type: none"> Evaluate numerical expressions by using whole-number exponents 	http://learnzillion.com/lessons/461-evaluate-numerical-expressions-by-using-wholenumber-exponents
b.	Evaluate expressions at specific values of their variables <ul style="list-style-type: none"> Evaluate one-step algebraic expressions by substitution Evaluate multiple step algebraic expressions by substitution 	http://learnzillion.com/lessons/468-evaluate-onestep-algebraic-expressions-by-substitution http://learnzillion.com/lessons/469-evaluate-multiple-step-algebraic-expressions-by-substitution
c.	Evaluate expressions that are formulas used in real world expressions such as for area and circumference <ul style="list-style-type: none"> Write and evaluate algebraic expressions using formulas 	http://learnzillion.com/lessons/470-write-and-evaluate-algebraic-expressions-using-formulas
d.	Perform arithmetic operations without parentheses, but including whole number exponents, according to the order of operations <ul style="list-style-type: none"> Evaluate a numerical expression using Order of Operations Write numerical expressions involving whole-number exponents Evaluate numerical expressions by using whole-number exponents Evaluate expression with multiple layers of parenthesis Which is more: 50,00 gold coins or the total of amount of gold coins (starting with 1) doubled each day for 28 days? 	http://learnzillion.com/lessons/460-write-numerical-expressions-involving-wholenumber-exponents http://learnzillion.com/lessons/461-evaluate-numerical-expressions-by-using-wholenumber-exponents http://illustrativemathematics.org/illustrations/1136 http://illustrativemathematics.org/illustrations/532
e.	Find the greatest common factor (GCF) for two whole numbers less or equal to 100 <ul style="list-style-type: none"> How to find the Greatest Common Factor using prime factors Greatest Common Factor by using the factors common in each number 	http://www.youtube.com/watch?v=uE9O8N5JYB4 http://www.mathsisfun.com/greatest-common-factor.html
f.	Find the least common multiple for two whole numbers equal to or less than 12 <ul style="list-style-type: none"> Least Common Multiple 	http://amphimath.com/

g.	<p>Show using the distributive property that the sum of two whole numbers (1 to 100) with a common factor is equivalent to the sum of the two whole numbers without the common factor multiplied by the common factor</p> <ul style="list-style-type: none"> The Distributive Property 	<p>http://www.khanacademy.org/math/arithmetic/number-properties/v/the-distributive-property</p>
3	Equivalent Algebraic Expressions	<p>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 $3y$.</p> <p>6.EE.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.</p>
a.	<p>Apply the properties of operations (such as the distributive, associative and commutative properties of multiplication and addition) to create equivalent expressions</p> <ul style="list-style-type: none"> Write equivalent expressions using the Distributive Property of Multiplication over Addition 	<p>http://learnzillion.com/lessons/649-write-equivalent-expressions-using-the-distributive-property-of-multiplication-over-addition</p>
b.	<p>Determine that two expressions are equivalent because they always produce equal result no matter of number replaces the variable</p> <ul style="list-style-type: none"> Understand equations using balance scales Short video lesson on Equivalent Expressions and Equations Write equivalent expressions using distributive property Read and write equivalent expressions with variables and exponents 	<p>http://learnzillion.com/lessonsets/71</p> <p>http://www.nutshellmath.com/textbooks_glossary_demos/glossary_content/equivalent_expressions_and_equations.html</p> <p>http://learni.st/learnings/13171-write-equivalent-expressions-using-distributive-property</p> <p>http://learnzillion.com/lessons/653-read-and-write-equivalent-expressions-with-variables-and-exponents</p>
4	Write and Solve Equations	<p>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.</p> <p>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.</p> <p>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.</p>
a.	<p>Solve an equation to find one or more values that makes it true; Prove the numbers found are true by substitution</p> <ul style="list-style-type: none"> Read and write equivalent expressions with variables and exponents 	<p>http://learnzillion.com/lessons/653-read-and-write-equivalent-expressions-with-variables-and-exponents</p>

b.	<p>Solve equations of the form $q = x+p$ and $q=px$ (where all three variable are positive)</p> <ul style="list-style-type: none"> • Solve algebraic equations involving addition and subtraction using inverse operations • Write an algebraic equation from a real-world scenario using multiplication and division • Fun basketball game to practice solving one variable equations • Number of firefighters given budget, salary, and benefits • Write an equation to determine the number of students who can sit around interlocking triangular tables • Write and solve an algebraic equation by determining when to use multiplication and division 	<p>http://learnzillion.com/lessons/1503-solve-algebraic-equations-involving-addition-and-subtraction-using-inverse-operations</p> <p>http://learnzillion.com/lessons/1504-write-an-algebraic-equation-from-a-realworld-scenario-using-multiplication-and-division</p> <p>http://www.mathchimp.com/6.3.1.php</p> <p>http://illustrativemathematics.org/illustrations/425</p> <p>http://illustrativemathematics.org/illustrations/494</p> <p>http://learnzillion.com/lessons/1505-write-and-solve-an-algebraic-equation-by-determining-when-to-use-multiplication-and-division</p>
5	Solve 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.
a.	<p>Solve an inequality to find one or more values that makes it true Prove the numbers found are true by substitution</p> <ul style="list-style-type: none"> • Read and write equivalent expressions with variables and exponents • Problems: Solutions to variable inequalities • Problems: Solve one-step linear inequalities • Lesson on Solving One-Step Linear Inequalities • Represent the solution set of an inequality using a number line 	<p>http://learnzillion.com/lessons/653-read-and-write-equivalent-expressions-with-variables-and-exponents</p> <p>http://www.ixl.com/math/grade-6/solutions-to-variable-inequalities</p> <p>http://www.ixl.com/math/grade-6/solve-one-step-linear-inequalities</p> <p>http://cphs.dadeschools.net/departments/mathematics/ebooks/alg1mcd/Source/LA106BBD.pdf</p> <p>http://learnzillion.com/lessons/1506-represent-the-solution-set-of-an-equality-using-a-number-line</p>
6	Write Inequalities	6.EE.8. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint 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.
a.	<p>Write inequalities of the form $x>c$ or $x<c$ to represent a real world or mathematical constraint; Represent inequalities on a number line</p> <ul style="list-style-type: none"> • Represent the solution set of an inequality using a number line • The weight of passengers on a log ride must be kept below what limit for the log to float • Write inequalities given a number line representation 	<p>http://learnzillion.com/lessons/1506-represent-the-solution-set-of-an-equality-using-a-number-line</p> <p>http://illustrativemathematics.org/illustrations/673</p> <p>http://learnzillion.com/lessons/1507-write-inequalities-given-a-number-line-representation</p>

7	Relationships	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.
a.	<p>Write an equation to represent a real-world problem in which values of the dependent variable change as a function of the values of the independent variable</p> <ul style="list-style-type: none"> • Direct Inverse and Joint Variation • Identify variables and their relationship in a real-world situation • Identify variables and their relationship in a table 	<p>http://www.khanacademy.org/math/algebra/algebra-functions/v/direct-inverse-and-joint-variation</p> <p>http://learnzillion.com/lessons/1654-identify-variables-and-their-relationship-in-a-realworld-situation</p> <p>http://learnzillion.com/lessons/1655-identify-variables-and-their-relationship-in-a-table</p>
b.	<p>Use graphs and tables to analyze the relationship between the independent and dependent variable</p> <ul style="list-style-type: none"> • Identify variables and their relationship in a graph • Write the equation of a graph using a table • Determining relationships from scatterplots 	<p>http://learnzillion.com/lessons/1656-identify-variables-and-their-relationship-in-a-graph</p> <p>http://learnzillion.com/lessons/1658-write-equation-of-a-graph-using-a-table</p> <p>http://www.regentsprep.org/Regents/math/ALGEBRA/AD4/scatter.htm</p>
GEOMETRY		
<p>Students are expected to:</p> <ul style="list-style-type: none"> • Solve real-world and mathematical problems involving area, surface area, and volume. 		
1	Area of Figures	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.
a.	<p>Find the area of triangles, quadrilateral, rectangles and other polygons constructed by combining rectangles, triangles and trapezoids</p> <ul style="list-style-type: none"> • Find the area of a parallelogram by decomposing into a rectangle • Find the area of a right triangle • Find the area of non-right triangles by composing a parallelogram 	<p>http://learnzillion.com/lessons/1058-find-the-area-of-a-parallelogram-by-decomposing</p> <p>http://learnzillion.com/lessons/1883-find-the-area-of-a-right-triangle</p> <p>http://learnzillion.com/lessons/1059-find-the-area-of-nonright-triangles-by-composing-a-parallelogram</p>

	<ul style="list-style-type: none"> • Area of triangles with the same base and height • Find the area of a trapezoid by composing a parallelogram • Find the area of polygons by decomposing into triangles, rectangles, parallelograms, and trapezoids • Find the area of irregular polygons by moving sections to form rectangles or by subtraction of the area outside of the shape from a rectangle enclosing it • Decomposing Polygons to Find Area 	http://illustrativemathematics.org/illustrations/510 http://learnzillion.com/lessons/1060-find-the-area-of-a-trapezoid-by-composing-a-parallelogram http://learnzillion.com/lessons/1061-find-the-area-of-polygons-by-decomposing-into-triangles-rectangles-parallelograms-and-trapezoids http://illustrativemathematics.org/illustrations/647 http://www.graniteschools.org/depart/teachinglearning/curriculuminstruction/math/elementarymathematics/K6%20Support%20Documents/6th%20Grade%20Support/Decomposing%20Polygons%20to%20Find%20Area.pdf
b.	<p>Find the area of triangles, quadrilateral, rectangles and other polygons in the context of solving real world and mathematical problems</p> <ul style="list-style-type: none"> • Solve real-world and mathematical problems involving area, surface area, and volume • The cost of painting a barn given the dimensions of the barn, the coverage of a gallon of paint and the cost of a gallon of paint 	http://www.graniteschools.org/depart/teachinglearning/curriculuminstruction/math/elementarymathematics/K6%20Support%20Documents/6th%20Grade%20Support/Concept%20Foundation/Conceptual%20Foundations%20-%20Geometry.pdf http://illustrativemathematics.org/illustrations/135
2	Volume of Rectangular Prisms	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 $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
a.	<p>Determine the volume of right rectangular prisms with fractional edge lengths by counting the number of unit cubes of fractional edge length it can contain</p> <ul style="list-style-type: none"> • Identify and label three-dimensional figures by locating faces, vertices, edges, and height • Find the volume of a rectangular prism using unit cubes • Number of fractional blocks needed to build a scale model building • Find the volume of a rectangular prism by filling it with unit cubes • Find the volume of a rectangular prism with fractional edge lengths using fractional unit cubes 	http://learnzillion.com/lessons/1487-identify-and-label-threedimensional-figures-by-locating-faces-vertices-edges-and-height http://learnzillion.com/lessons/196-find-the-volume-of-a-rectangular-prism-using-unit-cubes http://illustrativemathematics.org/illustrations/545 http://learnzillion.com/lessons/1062-find-the-volume-of-a-rectangular-prism-by-filling-it-with-unit-cubes http://learnzillion.com/lessons/1064-find-the-volume-of-a-rectangular-prism-with-fractional-edge-lengths
b.	<p>Determine the volume of right rectangular prisms by multiplying its length, width and height</p> <ul style="list-style-type: none"> • Calculating the volume of a rectangular prism, cube, cylinder and other geometric solids • Video showing the volume of a right rectangular prism = $L \times W \times H$ • Interactive tool for finding the surface area and the volume of a rectangular prism • Find the volume of a rectangular prism by developing a formula 	http://www.ehow.com/video_4980154_calculate-volume-rectangular-prism.html http://www.algebra-class.com/volume-formulas.html http://www.shodor.org/interactivate/activities/SurfaceAreaAndVolume/ http://learnzillion.com/lessons/1063-find-the-volume-of-a-rectangular-prism-by-developing-a-formula

c.	<p>Determine the volume of right rectangular prisms by multiplying the area of its base by its height</p> <ul style="list-style-type: none"> • Understanding Volume 	<p>http://grade8mathlinks.files.wordpress.com/2012/04/7_1_understanding_volume.pdf</p>
3	Nets	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.
c.	<p>Represent three-dimensional Rectangular Prisms and Pyramids using nets made up of rectangles and triangles</p> <ul style="list-style-type: none"> • NETS Made Easy • Represent three-dimensional figures with nets 	<p>http://amphimath.com/</p> <p>http://learnzillion.com/lessons/1219-represent-three-dimensional-figures-with-nets</p>
b.	<p>Determine the surface area of nets for three-dimensional Rectangular Prisms and Pyramids</p> <ul style="list-style-type: none"> • Analyze rectangular prisms to find surface area - Part 1 • Analyze rectangular prisms to find surface area - Part 2 • Analyze triangular prisms to find surface area - Part 1 • Analyze triangular prisms to find surface area - Part 2 	<p>http://learnzillion.com/lessons/1220-analyze-rectangular-prisms-to-find-surface-area-part-1</p> <p>http://learnzillion.com/lessons/1221-analyze-rectangular-prisms-to-find-surface-area-part-2</p> <p>http://learnzillion.com/lessons/1223-analyze-triangular-prisms-to-find-surface-area-part-1</p> <p>http://learnzillion.com/lessons/1224-analyze-triangular-prisms-to-find-surface-area-part-2</p>
c.	<p>Relate the use of nets to the solution of real-world and mathematical problems</p> <ul style="list-style-type: none"> • Solve real-world problems with surface area 	<p>http://learnzillion.com/lessons/1226-solve-realworld-problems-with-surface-area</p>
4	Coordinate Geometry	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.
a.	<p>Use coordinates in the coordinate plane to find the distance between two points (in a four quadrants) that have the same x or y coordinates</p> <ul style="list-style-type: none"> • Find the distance between two points in different quadrants 	<p>http://learnzillion.com/lessons/1148-find-the-distance-between-two-points-in-different-quadrants</p>
b.	<p>Use absolute value to find the distance between two points (in a four quadrants) that have the same x or y coordinates</p> <ul style="list-style-type: none"> • Use absolute value to find distances between points 	<p>http://learnzillion.com/lessons/1147-use-absolute-value-to-find-distances-between-points</p>

5	Drawing Polygons	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.
a.	Draw polygons connecting points in the coordinate plane given coordinates for the vertices of the figure <ul style="list-style-type: none"> • Draw polygons using given coordinates as vertices 	http://learnzillion.com/lessons/1065-draw-polygons-using-given-coordinates-as-vertices
b.	Find the length of sides of polygons made from joining points in the coordinate plane where the points have the same x or y coordinate <ul style="list-style-type: none"> • Find perimeter and area by finding the length of sides by comparing coordinates 	http://learnzillion.com/lessons/1066-find-perimeter-and-area-by-finding-the-length-of-sides-by-comparing-coordinates
c.	Relate the connection of points in the coordinate plane to the solution of real world and mathematical problems <ul style="list-style-type: none"> • Determine unknown ordered pairs using the characteristics of polygons • Find distances on a map by comparing ordered pairs 	http://learnzillion.com/lessons/1067-determine-unknown-ordered-pairs-using-the-characteristics-of-polygons http://learnzillion.com/lessons/1068-find-distances-on-a-map-by-comparing-ordered-pairs
STATISTICS AND PROBABILITY		
Students are expected to: <ul style="list-style-type: none"> • Develop understanding of statistical variability. • Summarize and describe distributions. 		
1	Statistical Questions	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.
a.	Define a statistical question as one which asks a question about data which is expected to be variable in response <ul style="list-style-type: none"> • Asking statistical questions 	http://learnzillion.com/lessons/541-asking-statistical-questions
b.	Determine whether a question is or is not a statistical question <ul style="list-style-type: none"> • Recognizing statistical questions 	http://learnzillion.com/lessons/540-recognizing-statistical-questions

2	Measuring the Center and Variability of Data Sets	<p>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.</p> <p>6.SP.5.c. Summarize numerical data sets in relation to their context, such as by: 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.</p>
a.	<p>Explain the use of the mean, median or mode to summarize the most typical value (center) of a data set with a single number Explain the overall pattern of data where each is most appropriate</p> <ul style="list-style-type: none"> • Measure of Central Tendency • Summarize the center of data with a single number using mean, median, and mode 	<p>http://www.regentsprep.org/Regents/math/ALGEBRA/AD2/measure.htm</p> <p>http://learnzillion.com/lessons/538-summarize-the-center-of-data-with-a-single-number-using-mean-median-and-mode</p>
b.	<p>The Mean</p> <ul style="list-style-type: none"> • Find the mean of a data set 	<p>http://learnzillion.com/lessons/534-find-the-mean-of-a-data-set</p>
c.	<p>The Median</p> <ul style="list-style-type: none"> • How to Find the Median Value 	<p>http://www.mathsisfun.com/median.html</p>
d.	<p>The Mode</p> <ul style="list-style-type: none"> • When in the mode used in real life? (paragraph 2) • The Mode of a Set of Data 	<p>http://mathforum.org/library/drmath/view/57600.html</p> <p>http://www.mathgoodies.com/lessons/vol8/mode.html</p>
e.	<p>Explain the use of the overall range, interquartile range and mean absolute deviation to provide a measure of variability from the center of a data set using a single number</p> <ul style="list-style-type: none"> • Describe the spread of data by finding range, interquartile range, and mean absolute deviation • Analyze the shape of a graph to describe the distribution of data • Summarize the spread of data using range and mean absolute deviation 	<p>http://learnzillion.com/lessons/544-describe-the-spread-of-data-by-finding-range-interquartile-range-and-mean-absolute-deviation</p> <p>http://learnzillion.com/lessons/537-analyze-the-shape-of-a-graph-to-describe-the-distribution-of-data</p> <p>http://learnzillion.com/lessons/539-summarize-the-spread-of-data-using-range-and-mean-absolute-deviation</p>
b.	<p>• Range</p> <ul style="list-style-type: none"> • Use and find the range of a data set 	<p>http://learnzillion.com/lessons/535-use-and-find-the-range-of-a-data-set</p>
c.	<p>• Interquartile Range</p> <ul style="list-style-type: none"> • Statistics - Compute the interquartile range (YouTube 1:57) 	<p>http://www.youtube.com/watch?v=ZAE-5TJy9kU</p>

d.	<ul style="list-style-type: none"> • Mean Absolute Deviation • Describe the distribution of data using the mean absolute deviation 	http://learnzillion.com/lessons/536-describe-the-distribution-of-data-using-the-mean-absolute-deviation
e.	<ul style="list-style-type: none"> • Application: Describing the center a distribution using mean, median or mode, plus the variability using dotplot, histogram or boxplot • The distribution of puppy weights 	http://illustrativemathematics.org/illustrations/1026
3 Plotting and Describing Data Sets		
a.	<p>Explain the use of measures of center, spread (variability) and shape of a data set to describe its distribution</p> <ul style="list-style-type: none"> • How to Describe Data Patterns in Statistics 	http://stattrek.com/statistics/charts/data-patterns.aspx?Tutorial=AP
b.	<p>Statistical Charts and Graphs</p> <ul style="list-style-type: none"> • Dot Plots, Histograms, Boxplots, Frequency and Cumulative Frequency plots, Scatterplots, Using charts and graphs to compare data sets 	http://stattrek.com/statistics/charts/data-patterns.aspx?Tutorial=AP
c.	<p>Dot Plots</p> <ul style="list-style-type: none"> • Dot Plots: A Useful Alternative to Bar Charts 	http://www.perceptualedge.com/articles/b-eye/dot_plots.pdf
d.	<p>Histograms</p> <ul style="list-style-type: none"> • Bar Charts and Histograms 	http://stattrek.com/statistics/charts/histogram.aspx?Tutorial=AP
e.	<p>Box Plots</p> <ul style="list-style-type: none"> • Boxplots (aka, Box and Whisker Plots) 	http://stattrek.com/statistics/charts/boxplot.aspx?Tutorial=AP
4 Statistical Question, Procedure and Analysis		
		<p>6.SP.5. Summarize numerical data sets in relation to their context, such as by:</p> <p>6.SP.5.a. Reporting the number of observations.</p> <p>6.SP.5.b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p>6.SP.5.d. 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>
a.	<p>Overview</p> <ul style="list-style-type: none"> • The statistical process (pp 55- 57) 	http://www.dpi.state.nc.us/docs/acre/standards/common-core-tools/unpacking/math/6th.pdf
b.	<ul style="list-style-type: none"> • The Question (Null Hypothesis) - The reason for collecting data 	http://udel.edu/~mcdonald/stathyptesting.html

c.	<ul style="list-style-type: none"> • The Independent Variable - the attribute of the data being manipulated 	http://stattrek.com/experiments/what-is-an-experiment.aspx?Tutorial=AP
d.	<ul style="list-style-type: none"> • The dependent Variable - the attribute of the data being measured 	http://stattrek.com/experiments/what-is-an-experiment.aspx?Tutorial=AP
e.	<ul style="list-style-type: none"> • Data Collection - How the attribute will be measured; the units of measurement, The number of observations <p>Overview</p> <p>The Basics</p>	http://en.wikipedia.org/wiki/Data_collection http://stattrek.com/descriptive-statistics/variables.aspx?Tutorial=AP
f.	<ul style="list-style-type: none"> • Data Display - Display the data using techniques such as dot plots, histograms, box plots 	http://stattrek.com/statistics/charts/data-patterns.aspx?Tutorial=AP
g.	<ul style="list-style-type: none"> • Analysis - measures of center, measures of variability, shape of the data distribution (determined from the data display) <p>Central Tendency</p> <p>Variability</p>	http://stattrek.com/descriptive-statistics/central-tendency.aspx?Tutorial=AP http://stattrek.com/descriptive-statistics/variability.aspx?Tutorial=AP
h.	<ul style="list-style-type: none"> • Conclusion - Is the question answered? 	http://explorable.com/writing-a-conclusion.html