Westside Consolidated School District Updated 1/19/15

Common Core State Standards

Curriculum Guide for Grade 7 Pre-Ap Mathematics

Grades 7 & 8 Math -- *in 1 year*

Grade 7 Overview

- **Ratios and Proportional Relationships**
  - **Analyze proportional relationships and use them to solve real-world and mathematical problems** --- ***compute unit rates associated with ratios of fractions; identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships; use proportional relationships to solve multi-step ratio and percent problems --- simple interest, tax, markups & markdowns, percent increase/decrease, gratuities, fees, percent error, etc.***
- **The Number System**
  - **Apply and extend previous understanding of operations with fractions to add, subtract, multiply, and divide rational numbers** – ***extend the rules for manipulating fractions to complex fractions*.**
- **Expressions and Equations**
  - **Use properties of operations to generate equivalent expressions.**
  - **Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
- **Geometry**
  - **Draw, construct, and describe geometrical figures and describe the relationship between them** -- ***solve problems involving scale drawings; draw geometric shapes with given conditions; describe the 2-D figures resulting from slicing 3-D figures, as in plane sections of right rectangular prisms and right rectangular pyramids.***
  - **Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.**
- **Statistics and Probability**
  - **Use random sampling to draw inferences about a population.**
  - **Draw informal comparative inferences about two populations** – ***use measures of center and measures of variability for numerical data from random samples.***
  - **Investigate chance processes and develop, use, and evaluate probability models** – ***find probabilities of compound events using organized lists, tables, tree diagrams, and simulations.***

Grade 8 Overview

- **The Number System**
  - **Know that there are numbers that are not rational, and approximate them by rational numbers** --- ***understand that every number has a decimal expansion; use the decimal expansion to determine if a number is rational or irrational; use rational approximations to compare irrational numbers and to locate irrational numbers on a number line diagram.***
- **Expressions and Equations**

- **Work with radicals and integer exponents** – *integer exponents can be positive or negative; solve equations using square root and cube root symbols; use numbers expressed as a single digit times an integer power of 10 to estimate very large or very small quantities; perform operations with numbers expressed in scientific notation.*
- **Understand the connections between proportional relationships, lines, and linear equations** -- *graph proportional relationships, interpreting the unit rate as the slope of the graph; use similar triangles to understand slope between any 2 distinct points on a non-vertical line in the coordinate plane; derive the equation y=mx for a line going through the origin and the equation y=mx + b for a line intercepting the vertical axis at b.*
- **Analyze and solve linear equations and pairs of simultaneous linear equations** – *solve linear equations in 1 variable; analyze & solve pairs of simultaneous linear equations (systems of 2 linear equations in 2 variables).*

- **Functions**
  - **Define, evaluate, and compare functions** – *determine input & output; compare 2 functions algebraically, graphically, numerically in tables, or by verbal descriptions; identify linear & nonlinear functions.*
  - **Use functions to model relationships between quantities** – *analyze the graphs to determine where the function is increasing or decreasing, if linear or nonlinear, etc.; sketch a graph that exhibits the qualitative features of a function that has been described verbally.*
- **Geometry**
  - **Understand congruence and similarity using physical models, transparencies, or geometry software** – *verify congruence* ***by using a sequence of rotations, reflections, and translations; describe similarity by using a sequence of rotations, reflections, translations, and dilations; use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.***
  - **Understand and apply the Pythagorean Theorem** –*explain a proof and its converse; find the unknown side length in a right triangle; find the distance between 2 points in a coordinate system.*
  - **Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres** – *know the formulas.*
- **Statistics and Probability**
  - **Investigate patterns of association in bivariate data** – *construct and interpret scatter plots to investigate patterns of association between 2 quantities -- clustering, outliers, positive or negative association, linear or nonlinear association; interpret the slope and intercept of the equation of a linear model; investigate bivariate categorical data by displaying frequencies and relative frequencies in a 2-way table .*

Grades 7 & 8 Resources:

The Common Core State Standards Home Page: http://www.corestandards.org/

The Common Core State Standards for Mathematics: http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

Common Core Unpacking resource: C2 Collaborative, Inc.: http://ccstudio.org/Home.aspx

Wynne County Public Schools, NC: Curriculum Guides: http://www.waynecountyschools.org/Page/375

CCSS: Standards for Mathematical Practice

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
7. **Look for and make use of structure.**
8. **Look for and express regularity in repeated reasoning.**

CCSS: Mathematics K – 8 Domains

Domains		K	1	2	3	4	5	6	7	8
Counting and Cardinality	CC									
Operations and Algebraic Thinking	OA				30-35%	12-17%	5-10%			
Number and Operations in Base Ten	NBT				5-10%	22-27%	22-27%			
Measurement and Data	MD				22-27%	12-17%	10-15%			
Geometry	G				10-15%	12-17%	2-7%	12-17 %	22-27%	20-25%
Number and Operations -- Fractions	NF				20-25%	27-32%	47-52%			
Ratios and Proportional Relationships	RP							12-17 %	22-27%	
The Number System	NS							27-32 %	7-12%	2-7%
Expressions and Equations	EE							27-32 %	22-27%	27-32%
Statistics and Probability	SP							7-12%	12-17%	15-20%
Functions	F									22-27%

7th Grade Mathematics • Unpacked Content

At A Glance*: Comparing the new *Common Core State Standards* to the old *Arkansas Frameworks

NEW to 7th Grade:

Constant of proportionality (unit rate) (**7.RP.2b**)
Percent of error (**7.RP.3**)
Factoring to create equivalent expressions (**7.EE.1**)
Constructing triangles from three measures of side lengths (**7.G.2**)
Area and circumference of circles (**7.G.4**)
Angles (supplementary, complementary, vertical) (**7. G.5**)
Surface area and volume of pyramids (**7.G.6**)
Probability (**7.SP.5 – 7.SP.8**)

MOVED from 7th Grade:

Similar and congruent polygons (moved to 8th grade)
Surface area and volume of cylinders (moved to 8th grade – volume only)
Creation of box plots and histograms (moved to 6th grade –- 7th grade continues to compare)
Linear relations and functions (y-intercept moved to 8th grade)
Views from 3-Dimensional figures (removed from *CCSS*)
Statistical measures (moved to 6th grade)

8th Grade Mathematics • Unpacked Content

At A Glance: Comparing the new *Common Core State Standards* to the old *Arkansas Frameworks*

NEW to 8th Grade:

Integer exponents with numerical bases (**8.EE.1**)
Scientific notation, including multiplication and division (**8.EE.3 and 8.EE.4**)
Unit rate as slope (**8.EE.5**)
Qualitative graphing (**8.F.5**)
Transformations (**8.G.1 and 8.G.3**)
Congruent and similar figures (characterized through transformations) (**8.G.2 and 8.G.4**)
Angles (exterior angles, parallel cut by transversal, angle-angle criterion) (**8.G.5)**
Finding diagonal distances on a coordinate plane using the Pythagorean Theorem (**8.G.8**)
Volume of cones, cylinders and spheres (**8.G.9**)
Two-way tables for bivariate categorical data (**8.SP.4**)

MOVED from 8th Grade:

Indirect measurement (embedded throughout)
Linear inequalities (moved to high school)
Effect of dimension changes (moved to high school)
Misuses of data (embedded throughout)
Function notation (moved to high school)
Point-slope form (moved to high school) and standard form of a linear equation (not in CCSS)

Directions:

This is a live document that will be the foundation for math instruction. The next four pages outline what should be taught during each nine-week period for Common Core Standards and vocabulary as a pacing guide. The fifth page is all of the nine-week periods on one page for all the information at-a-glance.

The Pacing Guide- In the last columns write in the Topic and lesson number from envisionMATH 2011 edition. This will allow you to decide what Topics best fit the standard. You can also add the Big Ideas if you would like to. Add any more information as necessary. Since this is a working document, feel free to make comments for adjustments in the future.

The At-A-Glance - Add page numbers, Topics, or lesson numbers next to the standard listed. At the bottom of each nine-weeks section list any projects, resources, or manipulatives to supplement the text.

Westside Consolidated School District **Mathematics Pacing Guide: Grade 7 Pre-Ap Math, *CCSS* Mathematics**

CCSS for Grade 7 Math and Grade 8 Math

Essential Questions should be incorporated into daily math activities in order to engage students in real life problem solving.

Domain	First Quarter	Second Quarter	Third Quarter	Fourth Quarter		
Ratios and Proportional Relationship **Gr. 7 (22% - 27%)**		**7.RP.1** **7.RP.2 a,b,c,d** (January)	**7.RP.3**			
The Number System **Gr. 7 (7% - 12%)** **Gr. 8 (2% - 7%)**	**7.NS.1 a,b,c,d** **7.NS.2 a,b,c,d** **7.NS.3**	**8.NS.1** **8.NS.2**				
Expressions and Equations **Gr. 7 (18% - 23%)** **Gr. 8 (27% – 32%)**	**7.EE.1** **7.EE.2** **7.EE.3** **7.EE.4 a,b**	**8.EE.1** **8.EE.2** **8.EE.3** **8.EE.4**				**8.EE.5** **8.EE.6** **8.EE.7 a,b** **8.EE.8 a,b,c**
Geometry **Gr. 7 (25% - 30%)** **Gr. 8 (20% - 25%)**			**7.G.1** **8.G.1 a,b,c** **7.G.2** **8.G.2** **8.G.3** **7.G.3** **8.G.4** **8.G.5**	**7.G.4** **7.G.5** **7.G.6**	**8.G.6** **8.G.9** **8.G.7** **8.G.8**	
Statistics and Probability **Gr. 7 (15% - 20%)** **Gr. 8. (15% - 20%)**			**7.SP.1** **7.SP.2** **7.SP.3** **7.SP.4**	**7.SP.5** **7.SP.6** **7.SP.7 a,b** **7.SP.8 a,b,c**	**8.SP.1** **8.SP.2** **8.SP.3** **8.SP.4**	
Functions **Gr. 8 (22% - 27%)**					**8.F.1** **8.F.4** **8.F.2** **8.F.5** **8.F.3**	
Textbook .						

Westside Consolidated School District ***Common Core State Standards*** **– Mathematics 7th Grade Pre-AP Pacing Guide**

1st Nine Weeks

Domain	*Common Core State Standards*	Major Topics/Concepts	Textbook Alignment & Resources
The Number System	**7.NS.1** **7.NS.2** **7.NS.3**	**Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.** ● **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. ➢ a. Describe situations in which opposite quantities combine to make 0. ➢ b. 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. ➢ c. Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. ➢ d. Apply properties of operations as strategies to add and subtract rational numbers. ● **7.NS.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. ➢ a. 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, and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. ➢ b. 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. ➢ c. Apply properties of operations as strategies to multiply and divide rational numbers. ➢ d. 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. ● **7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)	

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Expressions and Equations	**7.EE.1** **7.EE.2** **7.EE.3** **7.EE.4**	**Use properties of operations to generate equivalent expressions.** • **7.EE.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. • **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. **Solve real-life & mathematical problems using numerical & algebraic expressions & equations.** • **7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, & decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; assess the reasonableness of answers using mental computation & estimation strategies. • **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. ➢ a. 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. ➢ b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem	

Westside Consolidated School District ***Common Core State Standards*** **– Mathematics 7th Grade Pre-AP Pacing Guide**

2nd Nine Weeks

Domain	*Common Core State Standards*	Major Topics/Concepts	Textbook Alignment & Resources
Ratios and Proportional Relationships	**7.RP.1** **7.RP.2**	**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. ● **7.RP.2** Recognize and represent proportional relationships between quantities. ➢ a. 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. ➢ b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. ➢ c. Represent proportional relationships by equations. ➢ d. Explain what a point *(x, y)* on the graph of a proportional relationship means in terms of the situation, with special attention to the points *(0, 0)* and (1, *r*) where *r* is the unit rate. ●	
The Number System	**8.NS.1** **8.NS.2**	***Know that there are numbers that are not rational, and approximate them by rational numbers.*** ● **8.NS.1** Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational. ● **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., π2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*	

Expressions and Equations	**8.EE.1** **8.EE.2** **8.EE.3** **8.EE.4**	**Work with radicals and integer exponents** ● **8.EE.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$. ● **8.EE.2** Use square root and cube root symbols to represent solutions to equations of the form $x2 = p$ and $x3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational. ● **8.EE.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 × 108 and the population of the world as 7 × 109, and determine that the world population is more than 20 times larger.* ● **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.	

Westside Consolidated School District ***Common Core State Standards*** **– Mathematics 7th Grade Pre-AP Pacing Guide 3RD Nine Weeks**

Domain	*Common Core State Standards*	Major Topics/Concepts	Textbook Alignment & Resources
Ratios and Proportional Relationship	**7.RP.3**	• **7.RP.3** Use proportional relationships to solve multistep ratio and percent problems.	
Geometry	**7.G.1** **7.G.2** **7.G.3** **8.G.1** **8.G.2** **8.G.3** **8.G.4** **8.G.5**	**Draw, construct, and describe geometrical figures and describe the relationships between them.** • **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. • **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. • **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. **Understand congruence and similarity using physical models, transparencies, or geometry software**. • **8.G.1** Verify experimentally the properties of rotations, reflections, and translations: ➢ a. Lines are taken to lines, and line segments to line segments of the same length. ➢ b. Angles are taken to angles of the same measure. ➢ c. Parallel lines are taken to parallel lines. • **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. • **8.G.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. • **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. • **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.	
Statistics and Probability	**7.SP.1** **7.SP.2** **7.SP.3** **7.SP.4**	**Use random sampling to draw inferences about a population.** ● **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. ● **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. **Draw informal comparative inferences about two populations.** ● **7.SP.3** Informally assess the degree of visual overlap of two numerical data distributions with similar variability, measuring the difference between the centers by expressing it as a multiple of a measure of variability. ● **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	

Westside Consolidated School District ***Common Core State Standards*** **– Mathematics 7th Grade Pre-AP Pacing Guide**

4TH Nine Weeks

Domain	*Common Core State Standards*	Major Topics/Concepts	Textbook Alignment & Resources
Geometry	**7.G.4** **7.G.5** **7.G.6** **8.G.6** **8.G.7** **8.G.8** **8.G.9**	**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. ● **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. ● **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. **Understand and apply the Pythagorean Theorem** ● **8.G.6** Explain a proof of the Pythagorean Theorem and its converse. ● **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.	

Expressions and Equations	**8.EE.5** **8.EE.6** **8.EE.7** **8.EE8**	**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.* ● **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. **Analyze and solve linear equations and pairs of simultaneous linear equations.** ● **8.EE.7** Solve linear equations in one variable. ➢ a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers). ➢ b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. ● **8.EE.8** Analyze and solve pairs of simultaneous linear equations. ➢ a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. ➢ b. 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.* ➢ c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair***.** **Continue on next page…**	

Statistics and Probability	**7.SP.5** **7.SP.6** **7.SP.7** **7.SP.8** **8.SP.1** **8.SP.2** **8.SP.3** **8.SP.4**	**Investigate chance processes and develop, use, and evaluate probability models.** • **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 ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. • **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. • **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. ➢ a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. ➢ b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process • **7.SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. ➢ a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. ➢ b. Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language (ex 'rolling double sixes') identify the outcomes in the sample space which compose the event.. ➢ c. Design and use a simulation tool to generate frequencies for compound events. **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. • **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?* **Continue on next page….**	
Functions	**8.F.1** **8.F.2** **8.F.3** **8.F.4**	**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. (Note: Function notation is not required in Grade 8.) ● **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*. ● **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.* **Use functions to model relationships between quantities.** ● **8.F.4** Construct a function to model a linear relationship between two quantities. Determine the rat 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. ● **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.	

Westside Consolidated School District ***Common Core State Standards*** **– Mathematics 7th Grade Pre-AP Pacing Guide**

Textbook Resource:

Chapter Topics

CCSS 7th grade Pre-Ap Math

Critical Areas

1. **Developing understanding of and applying proportional relationships –** Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships.
2. **Developing understanding of operations with rational numbers and working with expressions and linear equations –** Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems.
3. **Solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume –** Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
4. **Drawing inferences about populations based on samples –** Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.

Mathematical Practices

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
7. **Look for and make use of structure.**

8. Look for and express regularity in repeated reasoning.

Ratios and Proportional Relationships (Weight of Std: 22 – 27%) 7.RP

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.*

7.RP.2 Recognize and represent proportional relationships between quantities.

a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or by graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

c. Represent proportional relationships by equations. *For example, if total cost **t** is proportional to the number 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**.*

d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.

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.*

The Number System (Weight of Standard: 7 – 12%) 7.NS

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

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.

a. 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.*

b. 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.

c. Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (–q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

d. Apply properties of operations as strategies to add and subtract rational numbers.

7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

a. 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.

b. 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* & *q* are integers, then *–(p/q) = (–p)/q = p/(–q)*. Interpret quotients of rational numbers by describing real-world contexts.

c. Apply properties of operations as strategies to multiply and divide rational numbers.

d. 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.

7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers. (NOTE: Computations with rational numbers extend the rules for manipulating fractions to complex factions.)

Expressions and Equations (Weight of Std: 22 – 27%) 7.EE

Use properties of operations to generate equivalent expressions.

7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

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."

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

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 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 3/4 inches long in the center of a door that is 27 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.*

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.

a. 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?*

b. Solve word problems leading to inequalities of the form *px + q > r or px + q < r*, where *p*, *q*, and *r* are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *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.*

Geometry (Weight of Standard: 22 – 27%) 7.G

Draw, construct, and describe geometrical figures and describe the relationships between them.

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.

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.

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.

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.

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.

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.

Statistics and Probability (Weight of Standard: 12 – 17%) 7.SP

Use random sampling to draw inferences about a population.

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.

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.*

Draw informal comparative inferences about two populations.

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.*

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.*

Investigate chance processes and develop, use, and evaluate probability models.

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.

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.*

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.

a. 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.*

b. Develop a probability 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?*

7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

b. Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.

c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*

Eighth Grade – *Common Core State Standards* – MATH

Critical Areas

1. **Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations –** Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students recognize equations for proportions ($y/x = m$ or $y = mx$) as special linear equations ($y = mx + b$), understanding that the constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope (m) of a line is a constant rate of change, so that if the input or x-coordinate changes by an amount A, the output or y-coordinate changes by the amount $m \cdot A$. Students also use a linear equation to describe the association between two quantities in bivariate data (such as arm span vs. height for students in a classroom). At this grade, fitting the model, and assessing its fit to the data are done informally. Interpreting the model in the context of the data requires students to express a relationship between the two quantities in question and to interpret components of the relationship (such as slope and y-intercept) in terms of the situation. Students strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original equation. Students solve systems of two linear equations in two variables and relate the systems to pairs of lines in the plane; these intersect, are parallel, or are the same line. Students use linear equations, systems of linear equations, linear functions, and their understanding of slope of a line to analyze situations and solve problems.
2. **Grasping the concept of a function and using functions to describe quantitative relationships –** Students grasp the concept of a function as a rule that assigns to each input exactly one output. They understand that functions describe situations where one quantity determines another. They can translate among representations and partial representations of functions (noting that tabular and graphical representations may be partial representations), and they describe how aspects of the function are reflected in the different representations.
3. **Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem –** Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems. Students show that the sum of the angles in a triangle is the angle formed by a straight line, and that various configurations of lines give rise to similar triangles because of the angles created when a transversal cuts parallel lines. Students understand the statement of the Pythagorean Theorem and its converse, and can explain why the Pythagorean Theorem holds, for example, by decomposing a square in two different ways. They apply the Pythagorean Theorem to find distances between points on the coordinate plane, to find lengths, and to analyze polygons. Students complete their work on volume by solving problems involving cones, cylinders, and spheres.

MATHEMATICAL PRACTICES

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
7. **Look for and make use of structure.**
8. **Look for and express regularity in repeated reasoning.**

THE NUMBER SYSTEM (Weight of Standard: 2 – 7%) 8.NS

Know that there are numbers that are not rational, and approximate them by rational numbers.

8.NS.1 Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational.

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.

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.*

EXPRESSIONS AND EQUATIONS (Weight of Std: 27 – 32%) 8.EE

Work with radicals and integer exponents.

8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

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.

8.EE.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as* 3×10^8 *and the population of the world as* 7×10^9*, and determine that the world population is more than 20 times larger.*

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.

8.EE.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a nonvertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.

Analyze and solve linear equations and pairs of simultaneous linear equations.

8.EE.7 Solve linear equations in one variable.

a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).

b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

8.EE.8 Analyze and solve pairs of simultaneous linear equations.

a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

b. 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.*

c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*

FUNCTIONS (Weight of Standard: 22 – 27%) 8.F

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. (Note*: Function notation is not required in Grade 8.*)

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.*

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.*

Use functions to model relationships between quantities.

8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

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.

GEOMETRY (Weight of Standard: 20 – 25%) 8.G

Understand congruence and similarity using physical models, transparencies, or geometry software.

8.G.1 Verify experimentally the properties of rotations, reflections, and translations:

a. Lines are taken to lines, and line segments to line segments of the same length.

b. Angles are taken to angles of the same measure.

c. Parallel lines are taken to parallel lines.

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.

8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

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.

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.*

Understand and apply the Pythagorean Theorem.

8.G.6 Explain a proof of the Pythagorean Theorem and its converse.

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.

STATISTICS AND PROBABILITY (Weight of Std: 15 – 20%) 8.SP

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.

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?*