Pre - Algebra Advanced 1205080 2013 - 2014

Number of blocks	Sections	Section to Standard Correlations	1st Quarter
Unit 4: Rational & Irrational Numbers (5.5 blocks)			
0.5	**1-1a**		
0.5	**1-1b**		
2	**5-3a - d**		
		1-1a, 1-2b	8.NS.1.1 Know that numbers that are not rational are called irrational.
			Understand informally that every number has a decimal expansion;
			for rational numbers show that the decimal expansion repeats
			eventually, and convert a decimal expansion which repeats
			eventually into a rational number
		5-3b-d	8.NS.1.2 Use rational approximations of irrational numbers to compare the
			size of irrational numbers, locate them approximately on a number
			line diagram, and estimate the value of expressions (e.g., π^2). *For*
			example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$
			is between 1 and 2, then between 1.4 and 1.5, and explain how to
			continue on to get better approximations.
			Lesson
			https://www.khanacademy.org/math/arithmetic/exponents-radicals/radical-radicals/v/approximating-square-roots
			http://www.youtube.com/watch?v=7rL3HW5gglU
			http://learnzillion.com/lessons/224-place-nonperfect-square-roots-between-2-integers
			http://learnzillion.com/lessons/224-place-nonperfect-square-roots-between-2-integers
			http://www.homeschoolmath.net/teaching/square-root-algorithm.php
			Practice
			https://www.khanacademy.org/math/arithmetic/exponents-radicals/radical-radicals/e/square_roots_2
		5-3a-c	8.EE.1.2 Use square root and cube root symbols to represent solutions to
		5-3d	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
			Lesson
			https://www.khanacademy.org/math/arithmetic/exponents-radicals/radical-radicals/v/finding-cube-roots
			https://docs.google.com/file/d/0Bz9eBjqfJlfDemFhN09HRTlwLW8/edit?pli=1
			http://www.mathsteacher.com.au/year9/ch03_pythagoras/04_cube_roots/cube_roots.htm
			Practice
			https://www.khanacademy.org/math/arithmetic/exponents-radicals/radical-radicals/e/cube_roots

Units 5 & 13: Pythagorean Theorem & Geometric Relationships (11 blocks)			
0.5	**6-2a**		
0.5	**6-2b**		
1	**6-3b**		
1	**7-1b**		
1	**7-1c**		
2.5	**7-2 a, b, c and MACC.8.G.2.6**		
2	**7-2d**		
		6-2a-b, 6-3b	8.G.1.5 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.
			Lesson
			http://www.mathsisfun.com/geometry/exterior-angles-polygons.html
			http://www.regentsprep.org/Regents/math/geometry/GG3/LPoly3.htm
			http://learnzillion.com/lessons/1229-find-the-measurement-of-an-exterior-angle
			http://www.youtube.com/watch?v=3apcEPQmhWc
			http://www.youtube.com/watch?v=s4KPzc6rSyE
		7-1b-c	NGSSS: MA.8.G.2.1 Use similar triangles to solve problems that include height and distances. FCAT
			Lesson
			http://www.mathsisfun.com/geometry/exterior-angles-polygons.html
			http://www.regentsprep.org/Regents/math/geometry/GG3/LPoly3.htm
			http://learnzillion.com/lessons/1229-find-the-measurement-of-an-exterior-angle
			http://www.youtube.com/watch?v=3apcEPQmhWc
			http://www.youtube.com/watch?v=s4KPzc6rSyE
		not addressed	8.G.2.6 Explain a proof of the Pythagorean Theorem and its converse
			http://learnzillion.com/lessons/1286-prove-the-pythagorean-theorem-using-squares-and-triangles
			Pythag and converse ALG/GEO
			http://www.brainingcamp.com/resources/math/pythagorean-formula/lesson.php
			Pythag – MARS Project – full lesson http://map.mathshell.org/materials/lessons.php?taskid=408&subpage=concept
			PD Engagement for Pythag - https://www.teachingchannel.org/videos/teaching-pythagorean-theorem
			Pythag Videos aligned to each geometry standard:
			http://mathflix.luc.edu/CommomCore/grade8/Geometry/common-core-8G-6-7-8-math-videos.html
		7-2a-c	8.G.2.7 Apply the Pythagorean Theorem to determine unknown side lengths
			in right triangles in real-world and mathematical problems in two and
			three dimensions.
		7-2d	8.G.2.8 Apply the Pythagorean Theorem to find the distance between two
			points in a coordinate system.

Units 6 & 9: Functions & Nonlinear Functions (8 blocks over Q1 & Q2)			
1	**2-2d**		
1	**2-3a**		
1	**2-3b**		
1	**2-3c**		
1	**2-3d**		
1	**MACC.8.F.2.5**		
		2-3a - d	8.F.1.1 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.
		2-3c	*NGSSS.MA.8.A.1.1 Create and interpret tables, graphs, and models to
			represent, analyze, and solve problems related to linear
			equations, including analysis of domain, range, and the
			difference between discrete and continuous data.
			{Tested on FCAT}
		2-2d	8.F.1.2 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.
		2-3c-d	8.F.1.3 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.
		not addressed	8.F.2.5 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.
			Lesson
			http://learnzillion.com/lessons/237-compare-linear-and-nonlinear-functions
			Note: Unit 6 asks students to distinguish linear & nonlinear functions in a general way. (8.F.1.3) Unit 9 builds on those foundations and asks students to investigate nonlinear functions more explicitly. (8.F.2.5) See comments in sequence document.
Q1 DFA: Unit 4 and Unit 5&13			

Number of blocks	Sections	Section to Standard Correlations	2nd Quarter
Units 6 & 9: Functions & Nonlinear Functions (8 blocks over Q1 & Q2)			
see Q1 for pacing			
Unit 7: Introduction to Linearity (5 blocks)			
2	**2-3b - c**		
1	**MACC.8.F.2.4**		
1	**3-1**		
1	**MACC.8.F.2.6**		
		2-3b,c	8.EE.2.6 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.
			http://www.youtube.com/watch?v=YabvLZo7DGc
			http://learnzillion.com/lessonsets/274-using-similar-triangles-to-explain-why-the-slope-m-is-the-same-between-two-points-on-a-nonvvertical-line-in-the-coordinate-plane
			http://schools.nyc.gov/NR/rdonlyres/1F533263-05A2-4723-9423-95ABC6C1CB9A/130937/NYCDOE_G8_Math_SlipperySlopes_Final.pdf
			http://www.opusmath.com/common-core-standards/8.ee.6-use-similar-triangles-to-explain-why-the-slope-m-is-the-same-between-any
			http://learnzillion.com/lessons/1472-derive-ymx-using-similar-triangles
		not addressed	8.F.2.4 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.
			Lesson Resources
			http://www.internet4classrooms.com/common_core/construct_function_model_linear_relationship_between_functions_eighth_8th_grade_math_mathematics.htm
			http://www.opusmath.com/common-core-standards/8.f.4-construct-a-function-to-model-a-linear-relationship-between-two
		3-1	8.EE.2.5 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.
			http://www.internet4classrooms.com/common_core/graph_proportional_relationships_interpreting_unit_rate_expressions_equations_eighth_8th_grade_math_mathematics.htm
			http://www.illustrativemathematics.org/illustrations/57
			http://www.pbslearningmedia.org/resource/midlit11.math.splgraph/graphing-distance-and-time-travel/
			http://www.graniteschools.org/depart/teachinglearning/curriculuminstruction/math/secondarymathematics/PreAlgebra%20Lessons/33-NewPreAlgLessonGMar4LinearGraphsWithProportionAndRate.pdf
			http://betterlesson.com/lesson/7876/rate-of-change-and-slope
		not addressed	8.EE.2.6 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.
			http://www.youtube.com/watch?v=YabvLZo7DGc
			http://learnzillion.com/lessonsets/274-using-similar-triangles-to-explain-why-the-slope-m-is-the-same-between-two-points-on-a-nonvvertical-line-in-the-coordinate-plane
			http://schools.nyc.gov/NR/rdonlyres/1F533263-05A2-4723-9423-95ABC6C1CB9A/130937/NYCDOE_G8_Math_SlipperySlopes_Final.pdf
			http://www.opusmath.com/common-core-standards/8.ee.6-use-similar-triangles-to-explain-why-the-slope-m-is-the-same-between-any
			http://learnzillion.com/lessons/1472-derive-ymx-using-similar-triangles

Unit 8: Patterns of Association in Bivariate Data (8 blocks over Q2 & Q3)			
1	**8-1**		
1	**8-2**		
1	**8-3c**		
2	**8-3d-e**		
1	**MACC.8.SP.1.4**		
		8-1	*NGSSS.MA.8.3.2 Determine and describe how changes in data values
			impact measures of central tendency. {Tested on FCAT
		8-2	*NGSSS.MA.8.3.1 Select, organize and construct appropriate data displays,
			including box and whisker plots, scatter plots, and lines
			of best fit to convey information and make conjectures
			about possible relationships. {Tested on FCAT
		8-3c	8.SP.1.1 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.
		8-3d-e	8.SP.1.2 Know that straight lines are widely used to model relationships
			between two quantitative variables. For scatter plots that suggest a
			linear association, informally fit a straight line, and informally
			assess the model fit by judging the closeness of the data points to
			the line.
			CCSS Lessons and videos
			http://learnzillion.com/lessons/1179-construct-a-scatter-plot
			http://learnzillion.com/lessons/1188-interpret-a-scatter-plot-by-identifying-clusters-and-outliers
			http://learnzillion.com/lessons/1200-interpret-scatter-plots
			http://learnzillion.com/lessons/1200-interpret-scatter-plots
			http://learnzillion.com/lessons/1203-draw-a-line-of-best-fit
			Barbie Bungee Scatter Plot Lesson http://illuminations.nctm.org/LessonDetail.aspx?id=L646
		8-3d-e	8.SP.1.3 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.
		not addressed	8.SP.1.4 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?
			http://www.mathsisfun.com/data/univariate-bivariate.html
			http://www.glencoe.com/sites/pdfs/impact_math/ls3_c3_two_way_tables.pdf
			http://learnzillion.com/lessonsets/295-understand-construct-and-interpret-twoway-tables
			http://www.mw.k12.ny.us/webpages/acollins/files/l-6%20relative%20frequency%20tables.pdf
S1 DFA Units 4, 5 & 13, 6 & 9, 7, and first part of 8			

Number of blocks	Sections	Section to Standard Correlations	3rd Quarter
Unit 8: Patterns of Association in Bivariate Data (8 blocks over Q2 & Q3)			
see Q2 for pacing			
Unit 10: Solving Linear Equations & Inequalities (11 blocks)			
0.5	**4-1c,d**		
1.5	**4-2b**		
0.5	**4-2c**		
1.5	**4-3**		
1	**4-4**		
1	**9-1a**		
0.5	**9-1b**		
1.5	**9-2a,b**		
		4-1c,d; 4-2b,c	8.EE.7a Give examples of linear equaitons in one variable with one solution, infinitely
		11-2b,c	many solutions, or no solutions. Show which of these possiblities 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).
			8.EE.7b Solve linear equations with rational number coefficients, including
			equations whose solutions require expanding expressions using the distributive
			property and collecting like terms.
		4-3, 4-4	NGSSS.MA.A.4.2 Solve and graph one- and two-step inequalities in one
			variable
		9-1a	NGSSS.MA.A.4.1 Solve literal equations for a specified variable.
		9-1b, 9-2a,b	NGSSS.MA.G.5.1 Compare, contrast, and convert units of measure
			between different measurement systems (US customary
			or metric (SI)) and dimensions including temperature,
			area, volume, and derived units to solve problems
Unit 11: Systems of Linear Equations (7 blocks)			
1.5	**3-2a**		
1	**3-2b**		
1.5	**3-3c**		
1	**3-3d**		
		3-2a,b	NGSSS.MA.8.A.1.2 Interpret the slope and the x- and y-intercepts when
			graphing a linear equation for a real-world problem.
		3-3c	8.EE.8a 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.
		3-3d	8.EE.8b 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.
			http://learnzillion.com/lessonsets/129-solve-systems-of-two-linear-equations-in-two-variables-algebraically-and-estimate-solutions-by-graphing
			http://www.youtube.com/watch?v=cbbjpFSBBD4&feature=youtu.be
Q3 DFA: Units 8, 10 and 11			

Number of blocks	Sections	Section to Standard Correlations	4th Quarter
Unit 12: Exponents & Scientific Notation (6 blocks)			
1.5	**5-1 a-c**		
1	**5-2a**		
1.5	**5-2b,c**		
		5-1 a-c, 5-2a	8.EE.1.1 Know and apply the properties of integer exponents to generate
			equivalent numerical expressions. *For example,*
			$3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$
		5-2b,c	8.EE.1.3 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 x 10^8 and
			the population of the world as 7 x 10^9, and determine that the world
			population is more than 20 times larger.
			http://learnzillion.com/lessonsets/272-estimate-and-compare-with-integers-to-the-power-of-10
			8.EE.1.4 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.
			http://learnzillion.com/lessonsets/276-perform-operations-with-numbers-expressed-in-scientific-notation-including-decimals
Unit 14: Volume of Cones, Spheres, & Cylinders (6 blocks)			
3	**10-2b, c**		
1	**9-2c**		
		10-2b, c	8.G.3.9 Know the formulas for the volumes of cones, cylinders, and spheres
			and use them to solve real-world and mathematical problems.
		9-2c	NGSSS MA.8.G.5.1 Converting between systems; Converting capacity;
			Converting rates
			Note: Cylinders and cones have previously been taught in 7th grade. They are
			now in 8th grade CCSSM, along with spheres.

Unit 1: Introducing Transformations (10 days)			
1	**10-1**		
1	**10-2**		
1	**10-3**		
		10-1 thru 10-3	8.G.1.1 Verify experimentally the properties of rotations, relflections 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.
Unit 2: Understanding Congruence through Transformations (5 blocks)			
not in book			
			8.G.1.2 Understand that a two-dimensional figure is congruent to another if
			the second can be obtained from the first by a sequence of
			rotations, reflections, and translations; given two congruent figures,
			describe a sequence that exhibits the congruence between them.
			http://learnzillion.com/lessons/1357-prove-two-figures-are-similar-after-a-dilation
			http://learnzillion.com/lessons/1336-prove-two-figures-are-congruent-after-a-series-of-reflections-rotations-or-dilations
			http://learnzillion.com/lessons/1398-describe-a-sequence-of-transformations
			http://www.internet4classrooms.com/common_core/understand_two_dimensional_figure_congruent_another_if_geometry_eighth_8th_grade_math_mathematics.htm
			8.G.1.3 Describe the effect of ~~dilations~~, translations, rotations, and reflections
			on two-dimensional figures using coordinates.
			https://www.georgiastandards.org/Common-Core/Common%20Core%20Frameworks/CCGPS_Math_8_8thGrade_Unit1SE.pdf
Unit 3: Understanding Similarity (ideally 6.5 blocks - may not cover in '13 - '14**)**			
not in book			
			8.G.1.3 Describe the effect of dilations, translations, rotations, and reflections
			on two-dimensional figures using coordinates.
			8.G.1.4 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.1.5 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.
			http://learnzillion.com/lessonsets/115-understanding-angle-sum-exterior-angles-angles-created-when-parallel-lines-are-cut-by-a-transversal-and-the-angleangle-criterion-for-similarity-of-triangles
S2 DFA Units 1, 2, 8, 10, 11, 12, 14 - emphasis Q4			