SPS Math 8 Scope and Sequence - Year at a Glance

Math 8 Course Overview:		
In Grade 8, instructional time should focus on three critical areas: (1) formulating and reasoning about expressions and equations, including modelingan association in bivariate data with a linear equations, and solving linear equations and systems of linear equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; (3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.		
Critical Area 1: Students use linear equations and systems of linear equations torepresent, analyze, and solve a variety of problems. Students recognize equations for proportions ($\frac{y}{x} = m$ or $y = mx$) as a special linear equation ($y = mx + b$), understanding that the constant of proportionality (m) of a line is a constant rate of change, so that if the input or x-coordinate changesby 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). Interpreting the model in the context of the data requires students to express a relationshipbetween 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 proceduresto 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 andrelate the systems to pairs of lines in the plane; these intersect, areparallel, 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.	**Critical Area 2:** Students grasp the concept of a function as a rulethat 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 maybe partial representations), and they describe how aspects of the function are reflected in the different representations).	**Critical Area 3:** 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 angle 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.

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	Instructional Event	Length of Unit	Time Frame
Semester 1	**Topic 0: Build the Math Community**	3	Quarter 1
	Topic 2: Analyze and Solve Linear Equations	23	Quarter 1
	Topic 3: Use Functions to Model Relationships	17	Quarter 1
	Topic 4: Investigate Bivariate Data	15	Quarter 2
	Topic 5: Analyze and Solve Systems of Linear Equations	15	Quarter 2
Semester 2	**Topic 1: Real Numbers**	25	Quarter 3
	Topic 6: Congruence and Similarity	25	Quarter 3
	Topic 7: Understand and Apply the Pythagorean Theorem	14	Quarter 3 – Quarter 4
	Topic 8: Solve Problems Involving Surface Area and Volume	13	Quarter 4
	Total number of days	**150**	

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	Topic 0	Topic 2	Topic 3	Topic 4	Topic 5	Topic 1	Topic 6	Topic 7	Topic 8
	Build the Math Community	**Analyze and Solve Linear Equations**	**Use Functions to Model Relationships**	**Investigate Bivariate Data**	**Analyze and Solve Systems of Linear Equations**	**Real Numbers**	**Congruence and Similarity**	**Understand and Apply the Pythagorean Theorem**	**Solve Problems Involving Surface Area and Volume**
Content and Math Practice Standards	**3 days**	**23 days**	**17 days**	**15 days**	**15 days**	**25 days**	**25 days**	**13 days**	**13 days**
	Build community	8.EE.5	8.F.1	8.F.3	8.EE.8a	8.NS.1	8.G.1a	8.G.6	8.G.9
		8.EE.6	8.F.2	8.F.4	8.EE.8b	8.NS.2	8.G.1b	8.G.7	
	Establish classrooms norms	8.EE.7a	8.F.3	8.SP.1	8.EE.8c	8.EE.1	8.G.1c	8.G.8	SMP 2
		8.EE.7b	8.F.4	8.SP.2		8.EE.2	8.G.2		SMP 7
	Practice math discourse		8.F.5	8.SP.3	SMP 2	8.EE.3	8.G.3	SMP 3	
		SMP 2		8.SP.4	SMP 3	8.EE.4	8.G.4	SMP 7	
		SMP 4	SMP 2		SMP 4		8.G.5	SMP 8	
		SMP 7	SMP 3	SMP 1	SMP 7	SMP 2			
			SMP 4	SMP 4		SMP 3	SMP 2		
			SMP 8	SMP 7		SMP 7	SMP 3		
							SMP 6		
							SMP 7		

Major Standards

Additional Standards

Supporting Standards

Some clusters require greater emphasis than the others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics. Note, however, that a standard can be individually important even though the indicated mathematics may require relatively little teaching time. Some clusters that are not major emphases in themselves are designed to support and strengthen areas of major emphasis, while other clusters that may not connect tightly or explicitly to the major work of the grade would fairly be called additional.

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