SPS Algebra 2 Scope and Sequence Year at a Glance

Algebra 2 Course Overview:

Building on their work with linear, quadratic, and exponential functions, students extend their repertoire of functions to include polynomial, rational, and radical functions. Students work closely with the expressions that define the functions, and continue to expand and hone their abilities to model situations and to solve equations, including solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations. The critical areas for this course, organized into four units, are as follows:

Critical Area 1: This critical area develops the structural similarities between the system of polynomials and the system of integers. Students draw on analogies between polynomial arithmetic and base-ten computation, focusing on properties of operations, particularly the distributive property. Students connect multiplication of polynomials with multiplication of multi-digit integers, and division of polynomials with long division of integers. Students identify zeros of polynomials, including complex zeros of quadratic polynomials, and make connections between zeros of polynomials and solutions of polynomial equations. The unit culminates with the fundamental theorem of algebra. A central theme of this critical area is that the arithmetic of rational expressions is governed by the same rules as the arithmetic of rational numbers.

Critical Area 2: Building on their previous work with functions, and on their work with trigonometric ratios and circles in Geometry, students now use the coordinate plane to extend trigonometry to model periodic phenomena.

Critical Area 3: Students synthesize and generalize what they have learned about a variety of function families. They extend their work with exponential functions to include solving exponential equations with logarithms. They explore the effects of transformations on graphs of diverse functions, including functions arising in an application, in order to abstract the general principle that transformations on a graph always have the same effect regardless of the type of the underlying function. They identify appropriate types of functions to model a situation, they adjust parameters to improve the model, and they compare models by analyzing appropriateness of fit and making judgments about the domain over which a model is a good fit. The description of modeling as "the process of choosing and using mathematics and statistics to analyze empirical situations, to understand them better, and to make decisions" is at the heart of this unit. The narrative discussion and diagram of the modeling cycle should be considered when knowledge of functions, statistics, and geometry is applied in a modeling context.

Critical Area 4: Students see how the visual displays and summary statistics they learned in earlier grades relate to different types of data and to probability distributions. They identify different ways of collecting data— including sample surveys, experiments, and simulations—and the role that randomness and careful design play in the conclusions that can be drawn.

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	Unit of Study	Length of Unit	Time Frame
Semester 1	Unit 1: Quadratics	28 days	Quarter 1
	Unit 2: Polynomials	15 days	Quarter 1
	Unit 3: Rational Exponents & Radical Functions	13 days	Quarter 1 - Quarter 2
	Unit 4: Exponential Functions & Intro to Logarithms	30 days	Quarter 2
Semester 2	Unit 5: Statistics	30 days	Quarter 3
	Unit 6: Rational Functions	20 days	Quarter 3 - Quarter 4
	Unit 7: Trigonometry	28 days	Quarter 4
	Total:	164 days	

Note: Within each unit, the standards are listed in the order in which they appear in the Common Core State Standards. This does not indicate a teaching order. The unit plan should sequence the learning of the standards to be most advantageous to student learning.

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Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Quadratics	Polynomials	Rational Exponents & Radical Functions	Exponential Functions & Intro to Logarithms	Statistics	Rational Functions	Trigonometry
28 days	15 days	13 days	30 days	30 days	20 days	28 days
N-Q.2 *	A-SSE.2	N-RN.1	N-Q.2 *	N-Q.2 *	A-SSE.2	N-Q.2 *
N-CN.1	A-APR.1	N-RN.2	A-SSE.2	S-ID.4 *	A-APR.6	A-SSE.2
N-CN.2	A-APR.2	N-RN.3	A-SSE.3c *	S-ID.6a *	A-CED.1 *	A-CED.2 *
N-CN.7	A-APR.3	A-SSE.2	A-SSE.4 *	S-ID.6b *	A-REI.1	A-REI.1
A-SSE.3a *	A-APR.4	A-CED.2 *	A-CED.1 *	S-ID.6c *	A-REI.2	F-IF.4 *
A-SSE.3b *	A-CED.1 *	A-REI.1	A-CED.2 *	S-ID.8 *	A-REI.11 *	F-IF.7e *
A-CED.2 *	A-CED.2 *	A-REI.2	A-REI.1	S-IC.1 *	F-IF.4 *	F-BF.1a *
A-REI.4a	A-REI.1	F-IF.7b *	A-REI.11 *	S-IC.2 *	F-BF.1a *	F-BF.3
A-REI.4b	A-REI.11 *	F-BF.3	F-IF.3	S-IC.3 *	F-BF.1b *	F-TF.1
A-REI.7	F-IF.4 *		F-IF.4 *	S-IC.4 *		F-TF.2
A-REI.11 *	F-IF.7c *	SMP 7	F-IF.6 *	S-IC.5 *	SMP 1	F-TF.5 *
F-IF.6 *	F-BF.1b *	SMP 8	F-IF.7e *	S-IC.6 *	SMP 2	F-TF.8
F-IF.7a *	F-BF.3		F-IF.8b		SMP 4	
F-IF.7b *			F-BF.1a *	SMP 1	SMP 6	SMP 2
F-IF.8a	SMP 1		F-BF.1b *	SMP 2		SMP 4
F-IF.9	SMP 6		F-BF.3	SMP 3		SMP 5
F-BF.3	SMP 7		F-LE.2 *	SMP 4		SMP 6
G-GPE.2			F-LE.4 *			
			F-LE.5 *			
SMP 1						
SMP 3			SMP 4			
SMP 4			SMP 6			
SMP 7			SMP 7			

Content Standards and Math Practices

Legend:
- Major Standards
- Additional Standards
- Supporting Standards

*Modeling Standards