SPS Algebra 2 Scope and Sequence - Year at a Glance

Algebra 2 Course Overview:

Students begin the course with a study of sequences, which is also an opportunity to revisit linear and exponential functions. Students represent functions in a variety of ways while addressing some aspects of mathematical modeling. This work leads to looking at situations that are well modeled by polynomials before pivoting to a study of the structure of polynomial graphs and expressions. Students do arithmetic on polynomials and rational functions and use different forms to identify asymptotes and end behavior. Students also study polynomial identities and use some key identities to establish the formula for the sum of the first n terms of a geometric sequence.

Next, students extend exponent rules to include rational exponents. They solve equations involving square and cube roots before developing the idea of i, a number whose square is -1, expanding the number system to include complex numbers. This allows them to solve quadratic equations with non-real solutions.

Building on rational exponents, students return to their study of exponential functions and establish that the property of growth by equal factors over equal intervals holds even when the interval has non-integer length. They use logarithms to solve for unknown exponents, and are introduced to the number e and its use in modeling continuous growth. Logarithm functions and some situations they model well are also briefly addressed.

Students learn to transform functions graphically and algebraically. In previous courses and units, students adjusted the parameters of particular types of models to fit data. Here, they consolidate and generalize this understanding. This work is useful in the study of periodic functions that comes next. Students work with the unit circle to make sense of trigonometric functions and use those functions to model periodic relationships.

The last unit, on statistical inference, focuses on analyzing data from experiments using normal distributions. Students learn to account for variability in data and estimate population mean, margin of error, and proportions using sampling and simulations. They develop skepticism about news stories that summarize data inappropriately.

Within the classroom activities, students have opportunities to engage in aspects of mathematical modeling. Additionally, modeling prompts are provided for use throughout the course. Modeling prompts offer opportunities for students to engage in the full modeling cycle. These can be implemented in a variety of ways.

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	Unit of Study	Length of Unit	Time Frame
Semester 1	Unit 0: Community and Routines	5 days	Quarter 1
	Unit 1: Sequences and Functions	11 days	Quarter 1
	Unit 2: Polynomials and Rational Functions	29 days	Quarter 1 – Quarter 2
	Unit 3: Complex Numbers and Rational Exponents	15 days	Quarter 2
	Unit 4: Exponential Functions and Equations (start)	5 days	Quarter 2
		65 days in S1	
Semester 2	Unit 4: Exponential Functions and Equations (finish)	14 days	Quarter 3
	Unit 5: Transformations of Functions	13 days	Quarter 3
	Unit 6: Trigonometric Functions	21 days	Quarter 4
	Unit 7: Statistical Inferences	18 days	Quarter 4
		66 days in S2	
	Total days	**131 days**	

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	Unit 0	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
	Community and Routines	**Sequences and Functions**	**Polynomials and Rational Functions**	**Complex Numbers and Rational Exponents**	**Exponential Functions and Equations**	**Transformation of Functions**	**Trigonometric Functions**	**Statistical Inferences**
Content Standards	**5 days**	**11 days**	**29 days**	**15 days**	**19 days**	**13 days**	**21 days**	**18 days**
	Build community	F-IF.A.3	A-SSE.A.1a	N-RN.A.1	N-RN.A.1	F-IF.B.4	N-Q.A.1	G-GPE.B.7
		F-IF.B.5	A-SSE.B.3	N-RN.A.2	A-SSE.A.1,1b	F-IF.C.8	F-IF.B.4	S-ID.A.1
	Establish classroom norms	F-IF.C	A-SSE.B.4	N-CN.A.1	A-SSE.B.3,3c	F-BF.A.1,1b	F-IF.C.7,7e	S-ID.A.4
		F-BF.A.1a	A-APR.A.1	N-CN.A.2	A-REI.D.11	F-BF.B.3	F-BF.B.3	S-IC.A.1
		F-BF.A.2	A-APR.B.3	N-CN.C.7	F-IF.A.2	F-LE.B	F-BF.B.4	S-IC.A.2
	Practice math discourse	F-LE.A.2	A-APR.C.4	A-REI.A.1	F-IF.B.4	S-ID.B.6a	F-TF.A.1	S-IC.B.3
			A-APR.D.6	A-REI.A.2	F-IF.C.7,7e		F-TF.A.2	S-IC.B.4
			A-CED.A.1	A-REI.B.4a	F-IF.C.8b		F-TF.B	S-IC.B.5
			A-CED.A.2	A-REI.B.4b	F-BF.A.1a		F-TF.B.5	
			A-CED.A.4	A-REI.D.11	F-LE.A.1a,1b,1c		F-TF.C.8	
			A-REI.A.1		F-LE.A.2			
			A-REI.A.2		F-LE.A.4			
			A-REI.C.7		F-LE.B.5			
			A-REI.D.11					
			F-IF.A.2					
			F-IF.B.4					
			F-IF.B.5					
			F-IF.C.7c					

Major Standards | Supporting Standards | Additional Standards

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