

Options EHS Algebra 1B-OR		Scope and Sequence
Unit	Lesson	Objectives
Polynomial Expressions		
Introduction to Polynomials		
		Identify a polynomial and its equivalent forms.
		Classify a polynomial by degree and number of terms.
Adding and Subtracting Polynomials		
		Add and subtract polynomials, determining the degree and number of terms of the sum or difference.
		Find and evaluate polynomial sums or differences that model real-world situations.
Multiplying Polynomials and Simplifying Expressions		
		Multiply a binomial by a trinomial algebraically and by using geometric models.
		Interpret the structure of an expression involving addition, subtraction, and multiplication of polynomials in order to write it as a single polynomial in standard form.
Unit Test		
Nonlinear Functions		
Absolute Value Functions and Translations		
		Graph the absolute value function and its translations.
		Analyze key features of the absolute value function and its translations.
The Square Root Function		
		Simplify a square root whose radicand is a perfect square.
		Graph the square root function and reflections over the axes.
		State the domain and range of square root functions.

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	The Cube Root Function	
		Graph the cube root function, and translations and reflections of it.
		State the key features of the cube root function, and translations and reflections of it.
	Radical Equations	
		Identify and solve radical equations.
		Identify extraneous solutions.
	Unit Test	
Exponential Functions		
	Exponential Growth Functions	
		Identify an exponential growth function given tables, graphs, and function rules, determining the rate of change.
		Graph an exponential growth function, and state the domain and range.
		State the domain and range of an exponential growth function.
		Write an exponential growth function to model a real-world problem, pointing out constraints in the modeling context.
	Exponential Decay Functions	
		Identify an exponential decay function given tables, graphs, and function rules, determining the rate of change.
		Graph an exponential decay function, and state the domain and range.
		Write an exponential decay function to model a real-world problem, pointing out constraints in the modeling context.
		Relate exponential growth and decay functions using laws of exponents and reflections over the y-axis.
	Linear Growth vs. Exponential Growth	
		Use tables and graphs to compare the growth of an exponential function vs. a linear function over equal intervals.
		Use tables and graphs to show that exponential functions grow by equal factors over equal intervals.

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	Vertical Stretches and Shrinks of Exponential Functions	Graph a vertically dilated exponential growth or decay function given a table, equation, or scenario.
		Determine the parameters and create an equation for a vertically dilated exponential growth or decay function given a table, equation, or scenario.
	Reflections of Exponential Functions	Graph reflections of exponential functions.
		Analyze key aspects of exponential functions that have been reflected across an axis.
	Translations of Exponential Functions	Graph translations of exponential functions.
		Analyze key aspects of exponential functions that have been translated.
	Unit Test	
Quadratic Functions		
	Introduction to Quadratic Functions	Identify a quadratic function and the values of the coefficients and constant from the standard form.
		Evaluate a quadratic function using tables, graphs, and equations.
		Calculate the rate of change of a quadratic function over an interval of its domain, and compare it to linear and exponential functions.
	Quadratic Functions: Standard Form	Graph a quadratic function given in standard form, identifying the key features of the graph.
	Quadratic Functions: Factored Form	Multiply a binomial by a monomial or binomial algebraically and by using geometric models.
		Identify a product that results in the difference of squares or a perfect square trinomial.
	Quadratic Functions: Vertex Form	

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		Graph a quadratic function given in vertex form, identifying the key features of the graph.
		Relate the parameters of a quadratic function in vertex form to transformations of the graph $y = x^2$.
	Completing the Square	
		Relate the geometric model of completing the square to the algebraic process.
		Write quadratic functions given in standard form and with $a = 1$ into vertex form by completing the square.
		Determine key aspects of the graph of a quadratic function given in standard form and with $a = 1$ by writing it in vertex form.
		Relate the parameters of a quadratic function in vertex form to transformations of the graph $y = x^2$.
	Unit Test	
Quadratic Equations		
	Solving Quadratic Equations: Zero Product Property	
		Solve problems by factoring quadratic equations given in standard form.
		Write quadratic equations given rational solutions.
	Solving Quadratic Equations: Factoring	
		Write a quadratic equation that models a scenario.
		Solve problems by rewriting quadratic equations in standard form and factoring, pointing out the solutions that are viable or not viable in a modeling context.
	Solving Quadratic Equations: Square Root Property	
		Use the square root property to solve quadratic equations.
	Solving Quadratic Equations: Completing the Square	
		Solve a quadratic equation whose leading coefficient is 1 by completing the square.

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	Solving Quadratic Equations: Completing the Square (Continued)	Solve a quadratic equation whose leading coefficient is greater than 1 by completing the square.
	Introduction to the Quadratic Formula	Justify the steps used to derive the quadratic formula by completing the square.
		Determine the values of a, b, and c from a given quadratic equation in standard form.
		Recognize an expression that uses the quadratic formula to find the solutions of a quadratic equation.
		Relate the discriminant in the quadratic formula to the types of solutions of a quadratic equation.
	Solving Quadratic Equations: Quadratic Formula	Solve a quadratic equation using the quadratic formula.
		Determine the number of real zeros of a quadratic function by finding the values of a, b, and c, and then calculating the discriminant.
	Modeling with Quadratic Equations	Write and solve quadratic equations to model real-world scenarios, estimating where appropriate and identifying solutions that are not viable in terms of the context.
	Solving Linear-Quadratic Systems	Solve a system of equations consisting of a line and a parabola algebraically and graphically, using technology where appropriate.
	Unit Test	
Data Analysis		
	Describing Data	Identify various data collection methods and analyze various displays of data.
		Determine if a sample fairly represents the population as a whole or if there is bias.
		Informally describe the shape, center, and variability of a distribution based on a dot plot, histogram, or box

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		plot.
	Two-Way Tables	Display data in a two-way frequency table given a scenario or Venn diagram, and identify joint and marginal frequencies. Calculate relative frequencies and display them in a two-way relative frequency table. Interpret joint and marginal relative frequencies in the context of the data.
	Relative Frequencies and Association	Create conditional relative frequency tables, by row and by column. Interpret conditional relative frequencies in the context of the data. Determine whether there is an association between two variables by analyzing conditional relative frequencies.
	Representing Data	Describe a data set using measures of central tendency and range. Determine if a representation of data is misleading.
	Measures of Center	Calculate the mean and median for a set of data using technology when appropriate. Compare the mean and median of a set of data that is symmetrical and for a set of data that is not symmetrical, determining which is a better measure of center for a given data set. Create a dot plot or histogram for a set of data. Discuss the effect of outliers on measures of center.

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Measures of Variability		Calculate the range, standard deviation, or interquartile range of a univariate data set.
		Interpret the range, standard deviation, or interquartile range of a univariate data set.
		Compare the spread given graphical displays of two univariate data sets.
		Use a graphing calculator to compute the numerical summary of a univariate data set.
Standard Deviation		Calculate variance and standard deviation for a given data set.
		Analyze histograms for skewness and symmetry.
		Analyze a normal distribution curve to determine statistical measures.
Box Plots		Create and interpret box plots.
		Analyze box plots for symmetry and outliers.
		Compare box plots.
Describing and Comparing Data with Dotplots and Stemplots		Identify and/or describe a dotplot.
		Identify and/or describe a stemplot.
		Compare two distributions using dotplots or stemplots.
Describing and Comparing Data with Histograms		Identify the patterns, shape, and spread of a distribution using histograms.
		Relate measures of center to the shape of a distribution using histograms.

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		Compare two distributions using histograms.
	Test	
	Linear Regression	
	Line of Best Fit	
		Determine if a data set shows a correlation and, if so, the type of correlation.
		Use technology to determine the line of best fit for a data set, and interpret the parameters of the model in context.
		Use a line of best fit to make a prediction.
		Determine if a given linear function is a reasonable model for a set of data arising from a real-world situation
	Analyzing Residuals	
		Compute the residuals for a set of data and a line of best fit.
		Determine the residual plot for a given scatterplot and line of best fit.
		Analyze the residual plot to determine whether the function is an appropriate fit for a linear model.
	Strength of Correlation	
		Calculate the correlation coefficient for a linear model using technology.
		Interpret the strength of a linear model based on the correlation coefficient.
		Analyze data to draw conclusions about correlation and causation.
	Regression Models	
		Determine an exponential, quadratic, or linear model for a given data set using technology.
		Identify limitations of models in real-world contexts.
		Use a linear, quadratic, or exponential regression model to make a prediction.
		Interpret the graph of a regression model in the context of the problem.
	Test	

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Cumulative Exam		
	Cumulative Exam Review	
	Cumulative Exam	