

Optio	ons EHS Algebra 1B-OR	Scope and Sequence
Unit	Lesson	Objectives
Poly	nomial 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	
Nonl	inear 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	
Quad	Iratic 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		