


## Precalculus Curriculum Bundle #6

<b>Title</b>		<b>Suggested Dates</b>
Trigonometric Functions (continued into bundle 7)		December 7 – December 18 (10 days)

Big Idea/Enduring Understanding	Guiding Questions
<ul style="list-style-type: none"> <li>• Trigonometric functions have unique and recognizable graphs.</li> <li>• Trigonometric functions can be used to model real world situations such as amplitude and frequency of sound waves and the movement of pendulums and Ferris wheels.</li> <li>• Trigonometric functions are periodic.</li> </ul>	<ol style="list-style-type: none"> <li>1. How do you determine the period of a trigonometric function?</li> <li>2. How many ways can you represent a particular trigonometric function?</li> <li>3. How can trigonometric graphs be used to solve trigonometric equations?</li> <li>4. What are some real world situations that can be modeled by trig functions?</li> </ol>

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the District Curriculum.

Knowledge & Skills with Student Expectations	District Specificity/Examples	Suggested Resources (See note above)	
<p><b>P.1 The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radical), exponential, logarithmic, trigonometric, and piecewise-defined functions.</b></p> <p>P.1A describe parent functions symbolically and graphically, including <math>f(x) = x^n</math>, <math>f(x) = \ln x</math>, <math>f(x) = \log_a x</math>, <math>f(x) = 1/x</math>, <math>f(x) = e^x</math>, <math>f(x) = a^x</math>, <math>f(x) = \sin x</math>, and <math>f(x) = \arcsin x</math>, etc.</p>	<ul style="list-style-type: none"> <li>• Graph the parent function on a graphing calculator.</li> <li>• Graph the parent functions without a calculator using a table of values.</li> <li>• Derive a function from a table of values using the statistical function of a graphing calculator.</li> <li>• Recognize parent functions from values displayed in a table or a graph.</li> <li>• Recognize parent functions from equations.</li> </ul>	<p><b>PreCalculus with Limits</b> Houghton Mifflin Company / Larson – Hostetler</p> <p>Section 4.5 Graphs of Sine and Cosine Functions</p> <p>Section 4.6 Graphs of Other Trigonometric Functions</p>	
<p><b>P.1 The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radical), exponential, logarithmic, trigonometric, and piecewise-defined functions.</b></p> <p>P.1B determine the domain and range of functions</p>	<ul style="list-style-type: none"> <li>• Modify the domain and range of an algebraic relation/function in the context of a given problem situation.</li> <li>• Connect domain and range with the concept of independent and dependent variables.</li> <li>• Describe domain and arrange with inequality notation, set notation, interval notation, and verbal descriptions.</li> <li>• Compare the domain and range of a transformed</li> </ul>	<p><b>PreCalculus with Limits</b> Houghton Mifflin Company / Larson – Hostetler</p> <p>Section 4.5 Graphs of Sine and Cosine Functions</p> <p>Section 4.6 Graphs of Other Trigonometric Functions</p>	

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<p>using graphs, tables, and symbols.</p>	<p>function and its parent..</p> <ul style="list-style-type: none"> <li>• Determine the domain and range from a graph.</li> <li>• Determine the domain and range from given data.</li> </ul>		
<p><b>P.1 The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radical), exponential, logarithmic, trigonometric, and piecewise-defined functions.</b></p> <p>P.1C describe symmetry of graphs of even and odd functions.</p>	<ul style="list-style-type: none"> <li>• Verify symmetry using algebraic procedures.</li> <li>• Discuss the two types of geometric symmetry (rotation symmetry and reflection symmetry).</li> </ul>	<p><b>PreCalculus with Limits</b> Houghton Mifflin Company / Larson – Hostetler</p> <p>Section 4.5 Graphs of Sine and Cosine Functions</p> <p>Section 4.6 Graphs of Other Trigonometric Functions</p>	
<p><b>P.1 The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radical), exponential, logarithmic, trigonometric, and piecewise-defined functions.</b></p> <p>P.1D recognize and use connections among significant values of a function (zeros, maximum values, and minimum values, etc.), points on the graph of a function, and the symbolic representation of a function.</p>		<p><b>PreCalculus with Limits</b> Houghton Mifflin Company / Larson – Hostetler</p> <p>Section 4.5 Graphs of Sine and Cosine Functions</p> <p>Section 4.6 Graphs of Other Trigonometric Functions</p>	
<p><b>P.1 The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radical), exponential, logarithmic, trigonometric, and piecewise-defined functions.</b></p> <p>P.1E investigate the concepts of continuity, end behavior, asymptotes, and limits and connect these characteristics to functions represented graphically and numerically</p>		<p><b>PreCalculus with Limits</b> Houghton Mifflin Company / Larson – Hostetler</p> <p>Section 4.5 Graphs of Sine and Cosine Functions</p> <p>Section 4.6 Graphs of Other Trigonometric Functions</p>	

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<p><b>P.3 The student uses functions and their properties, tools and technology to model and solve meaningful problems.</b></p> <p>P.3A Investigate properties of trigonometric and polynomial functions.</p>	<ul style="list-style-type: none"> <li>• Find roots using a calculator.</li> <li>• Find the roots (zeros, x-intercepts) by graphing the function.</li> <li>• Understand that trigonometric functions are periodic.</li> <li>• Use degree and radian measures.</li> <li>• Understand and use reference angle, standard position of angles and coterminal angles.</li> <li>• Given an angle in standard position whose terminal side intersects a circle: define the trig functions in terms of x, y, and r.</li> <li>• Connect the unit circle to the graphs of the trigonometric functions.</li> <li>• Connect the definitions of sine, cosine, and tangent to the other trigonometric functions (cosecant, secant, and cotangent) and x, y, and r.</li> <li>• Develop the inverse trigonometric functions and define the domain and range of each.</li> <li>• Apply the inverse trigonometric functions in problem situations.</li> </ul>	<p><b>PreCalculus with Limits</b> Houghton Mifflin Company / Larson – Hostetler</p> <p>Section 4.7 Inverse Trigonometric Functions</p>	
<p><b>P.3 The student uses functions and their properties, tools and technology to model and solve meaningful problems.</b></p> <p>P.3B use functions such as logarithmic, exponential, trigonometric, polynomial, etc. to model real-life data.</p>		<p><b>PreCalculus with Limits</b> Houghton Mifflin Company / Larson – Hostetler</p> <p>Section 4.8 Applications and Models</p>	
<p><b>P.3 The student uses functions and their properties, tools and technology to model and solve meaningful problems.</b></p> <p>P.3D use properties of functions to analyze and solve problems and make predictions.</p>	<ul style="list-style-type: none"> <li>• Use regression models to predict values between gathered points (interpolation) and outside of gathered points (extrapolation).</li> <li>• Connect equations to problem situations.</li> <li>• Connect the solution to an equation to a graphical solution.</li> </ul>	<p><b>PreCalculus with Limits</b> Houghton Mifflin Company / Larson – Hostetler</p> <p>Section 4.8 Applications and Models</p>	