# Algebra 2 (Woods/Roth)
# Coconino High School
# Week of May 4-8: Learning Guide

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| Course | Algebra 2 (Woods/Roth) | Week Assigned | 5/4-5/8 |
| Lesson Title | Graphing and Transformations of Sine and Cosine | | |
| Teacher(s), Email, & Other Contact Information | Emily Woods & Eric Roth ewoods@fusd1.org; eroth@fusd1.org | | |
| Target Standards | **HSF-BF.B.3** Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.<br><br>**HSF-IF.C.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. | | |
| Learning Goal | Students will be able to identify the effects of transformations on trigonometric functions based on its midline, amplitude, and period of a sine or cosine function.<br><br>Students will be able to graph sine and cosine functions using key features. | | |
| Essential Questions | How can we identify the key features of a trigonometric function by looking at the function or graph?<br><br>How do those key features transform the graph from its parent function? | | |
| Learning Activity | Students login to Khan Academy and complete the assignments, which includes instructional videos, practice problems, and a quiz.<br><br>Khan Academy Link:<br>https://www.khanacademy.org/math/trigonometry/trig-function-graphs<br><br>Lessons:<br>1) Transforming Sinusoidal Graphs | | |

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| | 2) Graphing Sinusoidal Functions |
| Resources | Google Classroom:<br>https://www.googleclassroom.com<br><br>Khan Academy:<br>https://www.khanacademy.org/math/trigonometry/trig-function-graphs |
| Links to Printable Materials | Week 3 Notes:<br>https://drive.google.com/file/d/1WBXydqpHn1lPFloUPG9-IwIkEyKWk12O/view?usp=sharing<br><br>Week 3 Practice Problems:<br><br>https://docs.google.com/document/d/1c4egCaKBlgIfkAIM4mJjRcZzv_2uXQGFNVfcaFP52SA/edit?usp=sharing |
| Extension & Enrichment | Students can further their practice by modelling sinusoidal functions<br><br>https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:trig/x2ec2f6f830c9fb89:sinusoidal-models/v/modeling-with-shifted-trig-functions |

# Algebra 2 (Woods/Roth)
# Coconino High School
# Week of April 27-May 1: Learning Guide

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| Course | Algebra 2 (Woods/Roth) | Week Assigned | 4/27-5/1 |
| Lesson Title | Graphing Sine and Cosine | | |
| Teacher(s), Email, & Other Contact Information | Emily Woods & Eric Roth ewoods@fusd1.org; eroth@fusd1.org | | |
| Target Standards | **HSF-IF.C.7.e** Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>**HSF-TF.B.5** Choose trigonometric functions to model periodic | | |

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| | phenomena with specified amplitude, frequency, and midline. |
| Learning Goal | Students will be able to identify the midline, amplitude, and period of a sine or cosine function.<br><br>Students will be able to graph sine and cosine functions using key features. |
| Essential Questions | How can we identify the key features of a trigonometric function by looking at the function or graph?<br><br>How can we distinguish between a sine and cosine graph? |
| Learning Activity | Students login to Khan Academy and complete the assignments, which includes instructional videos, practice problems, and a quiz.<br><br>Khan Academy Link:<br>https://www.khanacademy.org/math/trigonometry/trig-function-graphs<br><br>Lessons:<br>3) Graphs of sin(x) and cos(x)<br>4) Amplitude, Midline, and Period |
| Resources | Google Classroom:<br>https://www.googleclassroom.com<br><br>Khan Academy:<br>https://www.khanacademy.org/math/trigonometry/trig-function-graphs |
| Links to Printable Materials | Week 2 Notes:<br>https://drive.google.com/file/d/1WBXydqpHn1lPFIoUPG9-IwIkEyKWk12O/view?usp=sharing<br><br>Week 2 Practice Problems:<br>https://drive.google.com/file/d/1Y3XDrjxOzFEBa_3HAGw0LCLLb23aM9Tq/view?usp=sharing |
| Extension & Enrichment | Students can further their practice with graphing sine and cosine by completing these tasks<br>https://drive.google.com/file/d/1QauyO6Hqz9Lphr61d9qw4Xdh3-AqH1_v/view?usp=sharing |

# Algebra 2 (Woods/Roth)
# Coconino High School
# Week of April 20-24: Learning Guide

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| Course | Algebra 2 (Woods/Roth) | Week Assigned | 4/20-4/24 |
| Lesson Title | Unit Circle | | |
| Teacher(s), Email, & Other Contact Information | Emily Woods & Eric Roth ewoods@fusd1.org; eroth@fusd1.org | | |
| Target Standards | **A2.F-TF.A2** Extend the domain of trigonometric functions using the unit circle.<br><br>**A2.F-TF.A2.2** Explain how the unit circle in the coordinate plane enables the extension of sine and cosine functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. | | |
| Learning Goal | Calculate the radian angle measurement a point on a wheel rotates through by relating it to the distance traveled by the wheel.<br><br>Describe characteristics of points on a unit circle.<br><br>Describe the structure of the coordinates associated with specific radian measurements on the unit circle. | | |
| Essential Questions | What is the unit circle definition of the trigonometric functions?<br><br>How can trigonometric ratios explain points on a unit circle? | | |
| Learning Activity | Students login to Khan Academy and complete the assignments, which includes instructional videos, practice problems, and a quiz.<br><br>Khan Academy Link:<br>https://www.khanacademy.org/math/trigonometry/unit-circle-trig-func<br><br>Lessons:<br>5) Intro to Radians | | |

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| | 6) Unit Circle Definitions<br>7) Trigonometric Values of Special Angles |
| Resources | Google Classroom:<br>https://www.googleclassroom.com<br><br>Khan Academy:<br>https://www.khanacademy.org/math/trigonometry/unit-circle-trig-func |
| Extension & Enrichment | Practice with coterminal angles and reference angles:<br>- PDF posted to Google Classroom or can be found with this link https://cdn.kutasoftware.com/Worksheets/Alg2/Coterminal%20Angles%20and%20Reference%20Angles.pdf |

# Algebra 2 (Woods/Roth)
# Coconino High School
# Week of April 13-17: Learning Guide

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| Course | Algebra 2 | Week Assigned | April 13-17,2020 |
| Lesson Title | Transformations Continued: Scaling and Putting it All Together | | |
| Teacher(s), Email, & Other Contact Information | Emily Woods & Eric Roth ewoods@fusd1.org; eroth@fusd1.org | | |
| Target Standards | HSF-BF.B.3<br>Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.<br>HSS-ID.B.6.a<br>Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. | | |
| Learning Goal | • Calculate the scale factor “k” needed to transform the output of a function to fit data.<br>• Describe the effect of a scale factor on the output of a function. | | |

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| Essential Questions | • What is the scale factor needed to transform the output of a function to model data?<br>• What is the effect of a scale factor on the input of a function?<br>• What are the differences between scaling the outputs and scaling the inputs of a function? |
| Learning Activity | The purpose of this activity is to introduce students to the effect of scale factors on the output/input to a function. They start by sketching the transformation of a graph from a description. Students then write an equation for the new function in terms of the original.<br><br>Similar to how a graph translated left a certain amount of units and not right, students may find the relationship between compressing a graph horizontally and the corresponding equation are counter-intuitive. This activity is intended to address this common misconception directly using the familiar context of distance, time, and speed to help students make sense in their own words why multiplying the input by a scale factor greater than 1 means the graph is compressed instead of stretched. |
| Resources | Students are able to access assignments through Khan Academy using their Google Account to login. Students will submit assignments as they finish them in Khan Academy so the instructors can see their progress. These assignments include: Scaling, Putting it Together and Quiz 2 in Khan Academy. |
| Links to Printable Materials | https://im.kendallhunt.com/HS/teachers/3/5/8/preparation.html<br>https://im.kendallhunt.com/HS/teachers/3/5/9/preparation.html |
| Extension & Enrichment | Are you ready for more? If so, check out Combining Functions<br>https://im.kendallhunt.com/HS/teachers/3/5/9/preparation.html |

# Algebra 2 (Woods/Roth)
# Coconino High School
# Week of April 6-10 - Learning Guide

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| Course | Algebra 2 | Week Assigned | **April 6-10** |
| Lesson Title | Transformations of Functions | | |

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| Teacher(s), Email, & Other Contact Information | Emily Woods, Eric Roth<br>ewoods@fusd1.org; eroth@fusd1.org |
| Target Standards | HSF.BS.B: Shifting Functions, Reflecting Functions and Lines of Symmetry |
| Learning Goal | Students will be able to identify various types of transformations including shifting up/down/left/right, reflecting, and identifying where lines of symmetry occur. |
| Essential Questions | How do we get the parent function to move up/down/left/right and/or reflect over a line? Where is the line of symmetry in a graph, if there is one? |
| Learning Activity | Students will access the Khan Academy Videos and Lessons Through Google Classroom. After students complete the lessons they will take a quiz on Khan Academy. |
| Resources | • Khan Academy<br>• Printed Material for students without internet access. |
| Extension & Enrichment | Nearpod - Desmos Activity Translating Functions |