

Math Department Curriculum Map Template, 2018-19

Subject: Algebra II Honors

Textbook: McGraw Hill 2014

Algebra 2 Regents Examination Breakdown:

- **Number & Quantity** 5% - 12%
- **Algebra** 35% - 44%
- **Functions** 30% - 40%
- **Statistics & Probability** 14% - 21%

| Marking Periods | Unit Title (Big Idea/Major Focus) | Topics/Skills | Evidence of Learning (Assessments) | Resources (texts, online tools, etc.) |
|--------------------------------|---|---|---|--|
| <p>Marking Period 1</p> | <p>Unit 1: Linear Relations and Functions</p> <p>Enduring Understanding:</p> <ul style="list-style-type: none"> ● Mathematical models illustrate the behavior of real-world situations. ● Functions can be represented in multiple, equivalent ways. ● Linear functions describe a common difference at which variables change. <p>Essential Questions:</p> <ul style="list-style-type: none"> ● Why are relations and functions represented in multiple ways? ● How are the properties of functions and functional operations useful? ● How do you represent relations and functions? | <ul style="list-style-type: none"> ● Relations ● Functions ● Linear Relations ● Linear Functions ● Rate of Change ● Slope ● Writing Linear Equations ● Scatter Plots ● Lines of Regression ● Special Functions ● Parent Functions ● Transformations ● Graphing Linear Inequalities ● Graphing Absolute Value Inequalities <p>Vocabulary: Relation, function, rate of change, slope, scatter plot, regression, parent function, transformation, inequality, absolute value</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Pre-Assessment Check <input type="checkbox"/> Performance Tasks <input type="checkbox"/> Quizzes <input type="checkbox"/> Castle Learning <input type="checkbox"/> Exit Tickets <input type="checkbox"/> Do Nows <input type="checkbox"/> Class Discussion <input type="checkbox"/> Daily Handouts <input type="checkbox"/> Unit Review and Re-engagement Activities <input type="checkbox"/> Unit Exam | <p>Chapter 2 McGraw Hill 2014</p> <p>Homework Help: WolframAlpha MathPapa</p> <p>Calculators: How to Scientific Graphing</p> <p>Resources: Graph Paper</p> |
| | <p>Unit 2: Systems of Equations and Inequalities</p> <p>Enduring Understanding:</p> <ul style="list-style-type: none"> ● Mathematical models illustrate the behavior of real-world situations. ● Linear functions describe a common difference at which variables change. <p>Essential Questions:</p> <ul style="list-style-type: none"> ● What does the solution to a system represent? ● How do we use matrices to represent real world situations? | <ul style="list-style-type: none"> ● Solving Systems of Equations ● Solving Systems of Inequalities ● Graphing Systems Of Inequalities ● Optimization with Linear Programming ● Systems of Equations in Three Variables ● Operations with Matrices ● Multiplying Matrices ● Solving Systems of Equations Using Cramer's Rule ● Solving Systems of Equations Using Inverse Matrices <p>Vocabulary: Equation, Inequality, System, Optimization, three variable system, matrix, Cramer's rule, inverse matrix</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Pre-Assessment Check <input type="checkbox"/> Performance Tasks <input type="checkbox"/> Quizzes <input type="checkbox"/> Castle Learning <input type="checkbox"/> Exit Tickets <input type="checkbox"/> Do Nows <input type="checkbox"/> Class Discussion <input type="checkbox"/> Daily Handouts <input type="checkbox"/> Unit Review and Re-engagement Activities <input type="checkbox"/> Unit Exam | <p>Chapter 3 McGraw Hill 2014</p> |
| | <p>Unit 3: Inverses, Radical Functions, and Relations</p> <p>Enduring Understanding:</p> <ul style="list-style-type: none"> ● An inverse function is a function that "undoes" another function; if $f(x)$ maps x to y, then $f^{-1}(x)$ maps y back to x. <p>Essential Questions:</p> | <ul style="list-style-type: none"> ● Operations on Functions ● Inverse Functions and Relations ● Square Root Functions ● Square Root Inequalities ● nth Roots ● Operations with Radical Expressions ● Rational Exponents ● Solving Radical Equations ● Solving Radical Inequalities <p>Vocabulary: Function, Radical, Rational Exponent, nth root</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Pre-Assessment Check <input type="checkbox"/> Performance Tasks <input type="checkbox"/> Quizzes <input type="checkbox"/> Castle Learning <input type="checkbox"/> Exit Tickets <input type="checkbox"/> Do Nows <input type="checkbox"/> Class Discussion <input type="checkbox"/> Daily Handouts <input type="checkbox"/> Unit Review and Re-engagement Activities <input type="checkbox"/> Unit Exam | <p>Chapter 6 McGraw Hill 2014</p> |

| Quarterly Exam #1 (Cumulative) | | | | |
|---|---|---|---|----------------------------|
| Marking Period 2 | <p>Unit 4: Quadratic Functions and Relations</p> <p>Enduring Understanding:</p> <ul style="list-style-type: none"> The structure of quadratic graphs and equations gives insights into their roots. A circle is symmetrical and its points are related by a center and radius. Functions within a family are transformations of the parent function. <p>Essential Questions:</p> | <ul style="list-style-type: none"> Graphing Quadratic Functions Solving Quadratic Equations by Graphing Solving Quadratic Equations by Factoring Complex Numbers Completing the Square The Quadratic Formula Discriminant Transformation of Quadratic Graphs Quadratic Inequalities <p>Vocabulary: Function, Quadratic, Complex, Quadratic Formula, Roots, Completing the Square, Quadratic Inequality</p> | <ul style="list-style-type: none"> Pre-Assessment Check Performance Tasks Quizzes Castle Learning Exit Tickets Do Nows Class Discussion Daily Handouts Unit Review and Re-engagement Activities Unit Exam | Chapter 4 McGraw Hill 2014 |
| | <p>Unit 5: Polynomials and Polynomial Functions</p> <p>Enduring Understanding:</p> <ul style="list-style-type: none"> The degree of a polynomial function determines its possible solutions, behaviors and properties. The structure of polynomial graphs and equations gives insights into their roots. Rational functions describe the quotient of two polynomial functions. Mathematical models illustrate the behavior of real-world situations. <p>Essential Questions:</p> | <ul style="list-style-type: none"> Operations with Polynomials Dividing Polynomials Polynomials Functions Analyzing Graphs of Polynomials Functions Solving Polynomials Equations The Remainder Theorem The Factor Theorem Roots Zeros Rational Zero Theorem <p>Vocabulary: Polynomial function, synthetic division, long division, remainder, zeros/roots, theorem</p> | <ul style="list-style-type: none"> Pre-Assessment Check Performance Tasks Quizzes Castle Learning Exit Tickets Do Nows Class Discussion Daily Handouts Unit Review and Re-engagement Activities Unit Exam | Chapter 5 McGraw Hill 2014 |
| | <p>Unit 6: Rational Functions and Relations</p> <p>Enduring Understanding:</p> <ul style="list-style-type: none"> Rational Functions model phenomena including electrical circuits, magnetism, percentages, cost analysis in business. Rational functions have asymptotes. Division by zero results in unbounded behavior of a function and is therefore undefined <p>Essential Questions:</p> | <ul style="list-style-type: none"> Multiplying Rational Expressions Dividing Rational Expressions Adding Rational Expressions Subtracting Rational Expressions Graphing Reciprocal Functions Graphing Rational Functions Variation Functions Solving Rational Equations Solving Rational Inequalities <p>Vocabulary: Rational expression, operation, reciprocal function, variation function, rational equation/inequality</p> | <ul style="list-style-type: none"> Pre-Assessment Check Performance Tasks Quizzes Castle Learning Exit Tickets Do Nows Class Discussion Daily Handouts Unit Review and Re-engagement Activities Unit Exam | Chapter 8 McGraw Hill 2014 |
| <ul style="list-style-type: none"> Midterm - Quarterly Exam #2 (Cumulative) | | | | |
| Marking Period 3 | <p>Unit 7: Exponential and Logarithmic Functions and Relations</p> <p>Enduring Understanding:</p> <ul style="list-style-type: none"> Exponential functions describe a common ratio at which variables change. Expressions with exponents can be written in multiple, equivalent ways. A logarithm is the inverse of an exponential function. Logarithms can be written in multiple, equivalent ways. Mathematical models illustrate the behavior of | <ul style="list-style-type: none"> Graphing Exponential Functions Solving Exponential Equations Solving Exponential Inequalities Logarithms Logarithmic Functions Solving Logarithmic Equations Solving Logarithmic Inequalities Properties of Logarithms Common Logarithms Base e and Natural Logarithms Using Exponential Functions Using Logarithmic Functions | <ul style="list-style-type: none"> Pre-Assessment Check Performance Tasks Quizzes Castle Learning Exit Tickets Do Nows Class Discussion Daily Handouts Unit Review and Re-engagement Activities Unit Exam | Chapter 7 McGraw Hill 2014 |

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| | <p>real-world situations. Essential Questions:</p> | | | |
| | <p>Unit 8: Conic Sections Enduring Understanding:</p> <ul style="list-style-type: none"> Conic sections are used in a variety of construction and scientific applications such as bridge design, planetary and satellite orbits, mirrors, navigation and arches. The angle or direction you cut through a cone determines the type of conic you will get. Certain key points and axis are vital to graphing and using the conic sections to real world problems. <p>Essential Questions:</p> | <ul style="list-style-type: none"> Midpoint Formula Distance Formula Parabolas Circles Ellipses Hyperbolas Identifying Conic Sections Solving Linear-Nonlinear Systems | <ul style="list-style-type: none"> Pre-Assessment Check Performance Tasks Quizzes Castle Learning Exit Tickets Do Nows Class Discussion Daily Handouts Unit Review and Re-engagement Activities Unit Exam | Chapter 9 McGraw Hill 2014 |
| | <p>Unit 9: Sequences and Series Enduring Understanding:</p> <ul style="list-style-type: none"> Sequences are discrete functions defined by their rates of change. Sequences and series can model many mathematical ideas and realistic situations. Sequences help us recognize and apply patterns to familiar and unfamiliar situations. <p>Essential Questions:</p> | <ul style="list-style-type: none"> Sequences as Functions Arithmetic Sequences Arithmetic Series Geometric Sequences Geometric Series Infinite Geometric Series Recursion Iteration The Binomial Theorem Mathematical Induction | <ul style="list-style-type: none"> Pre-Assessment Check Performance Tasks Quizzes Castle Learning Exit Tickets Do Nows Class Discussion Daily Handouts Unit Review and Re-engagement Activities Unit Exam | Chapter 10 McGraw Hill 2014 |
| | <p>• Quarterly Exam #3 (Cumulative)</p> | | | |
| Marking Period 4 | <p>Unit 10: Statistics and Probability Enduring Understanding:</p> <ul style="list-style-type: none"> Measures of center are used to interpret univariate data. Visual models illustrate the correlation of bivariate data. Statistical data from random processes can be predicted using probability calculations. The accuracy of a prediction of a random event increases with the number of events considered. Probability calculations can be applied to solve problems and make decisions. | <ul style="list-style-type: none"> Designing a Study Distributions and Data Probability Distributions The Binomial Distributions The Normal Distribution Confidence Intervals Hypothesis Testing | <ul style="list-style-type: none"> Pre-Assessment Check Performance Tasks Quizzes Castle Learning Exit Tickets Do Nows Class Discussion Daily Handouts Unit Review and Re-engagement Activities Unit Exam | Chapter 11 McGraw Hill 2014 |
| | <p>Unit 11: Trigonometric Functions Enduring Understanding:</p> <ul style="list-style-type: none"> The Unit Circle illustrates properties of trigonometric functions. The features of a periodic function repeat over a constant interval. Trigonometric functions are characterized by the period and amplitude. | <ul style="list-style-type: none"> Trigonometric Functions in Right Triangles Angles Angle Measure Trigonometric Functions of General Angles Law of Sines Law of Cosines Circular Functions Periodic Functions Graphing Trigonometric Functions Translations of Trigonometric Graphs Inverse Trigonometric Functions | <ul style="list-style-type: none"> Pre-Assessment Check Performance Tasks Quizzes Castle Learning Exit Tickets Do Nows Class Discussion Daily Handouts Unit Review and Re-engagement Activities Unit Exam | Chapter 12 McGraw Hill 2014 |
| | <p>Unit 12: Trigonometric Identities and Equations Enduring Understanding:</p> | <ul style="list-style-type: none"> Trigonometric Identities Verifying Trigonometric Identities | <ul style="list-style-type: none"> Pre-Assessment Check Performance Tasks | Chapter 13 McGraw Hill 2014 |

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| | <ul style="list-style-type: none"> • Fundamental identities can be used to verify more complicated trigonometric identities • We can use formulas to find exact values of angles that are combinations of unit circle angles | <ul style="list-style-type: none"> • Sum of Angles Identities • Difference of Angles Identities • Double-Angle Identities • Half-Angle Identities • Solving Trigonometric Equations | <ul style="list-style-type: none"> <input type="checkbox"/> Quizzes <input type="checkbox"/> Castle Learning <input type="checkbox"/> Exit Tickets <input type="checkbox"/> Do Nows <input type="checkbox"/> Class Discussion <input type="checkbox"/> Daily Handouts <input type="checkbox"/> Unit Review and Re-engagement Activities <input type="checkbox"/> Unit Exam | |
| | <p>Unit 13: Regents Review</p> | | <ul style="list-style-type: none"> <input type="checkbox"/> Pre-Assessment Check <input type="checkbox"/> Performance Tasks <input type="checkbox"/> Quizzes <input type="checkbox"/> Castle Learning <input type="checkbox"/> Exit Tickets <input type="checkbox"/> Do Nows <input type="checkbox"/> Class Discussion <input type="checkbox"/> Daily Handouts <input type="checkbox"/> Unit Review and Re-engagement Activities <input type="checkbox"/> Unit Exam | |
| <p>Quarterly Exam #4t: Algebra 2 Regents</p> | | | | |
| <p>Summer</p> | <p>Summer Assignment:</p> | | | |