

CPM Algebra 2 Pacing Calendar and Standards Alignment

 - Non-Math Teaching days/ Holidays

| First Semester Instructional Days | 1         | 2 | 3    | 4 | 5 | 6         | 7 | 8 | 9 | 10 | 11        | 12        | 13 | 14 | 15 | 16        | 17 | 18 | 19   | 20   | 21   | 22        | 23 |  |  |  |
|-----------------------------------|-----------|---|------|---|---|-----------|---|---|---|----|-----------|-----------|----|----|----|-----------|----|----|------|------|------|-----------|----|--|--|--|
| Sept.                             |           |   |      |   |   | Chapter 1 |   |   |   |    | Chapter 1 |           |    |    |    | Chapter 1 |    |    |      |      | Ch 2 |           |    |  |  |  |
| Oct.                              | Chapter 2 |   |      |   |   | Chapter 2 |   |   |   |    | Chapter 2 |           |    |    |    | Chapter 2 |    |    | Ch 3 | Ch 3 |      |           |    |  |  |  |
| Nov.                              | Chapter 3 |   |      |   |   | Chapter 3 |   |   |   |    | Ch 3      | Chapter 4 |    |    |    | Chapter 4 |    |    |      |      | Ch 4 |           |    |  |  |  |
| Dec.                              | Chapter 4 |   |      |   |   | Chapter 5 |   |   |   |    | Chapter 5 |           |    |    |    | Chapter 5 |    |    |      |      |      |           |    |  |  |  |
| Jan.                              |           |   | Ch 6 |   |   | Chapter 6 |   |   |   |    | Chapter 6 |           |    |    |    | Exam      |    |    | Ch 7 |      |      | Chapter 7 |    |  |  |  |

| Chapter 1 (15 days)  | Chapter 2 (20 days)  | Chapter 3 (14 days)  | Chapter 4 (13 days)   | Chapter 5 (13 days)  | Chapter 6 (13 days)   |
|--|--|--|---|--|---|
| <p><b>Investigations and Functions:</b></p> <p>Welcome to Algebra 2! This chapter will introduce you to the ways you will be working as well as several of the big ideas in this course. You will share your current mathematical knowledge with your study team as you work together to solve problems. Some of these ideas you will revisit later in the course and connect to new mathematical ideas. You will learn to work with a graphing calculator to help you discover qualities of functions and systems of functions.</p> | <p><b>Transformations of Parent Graphs:</b></p> <p>In the first section of Chapter 2, you will learn how to change the equation of a parabola to make it fit a set of nonlinear data. After you learn how to stretch, compress, reflect, and shift the graph of <math>f(x) = x^2</math>, you will be able to create a variety of parabolic shapes and sizes.</p> <p>You will learn that a graph's transformations are clearly recognizable when its equation is written in graphing form. Understanding this form will help you learn how to rewrite equations so that they are easier to graph. You will also use the quadratic family of functions to model physical situations, such as the arc of a jumping rabbit and the path of a soccer ball.</p> <p>In Section 2.2, you will apply these same types of transformations to other parent functions.</p> | <p><b>Equivalent Forms:</b></p> <p>In previous chapters, you looked at ways to organize your algebraic thinking using multiple representations such as graphs, tables, and equations. In this chapter, you will focus on rewriting expressions in order to have more useful equivalent forms. You will remind yourself what it means for two expressions or equations to be equivalent. You will then rewrite equations to solve them more easily.</p> <p>Another focus of this chapter is learning how to combine algebraic fractions (called "rational expressions") and expressions with exponents. By using the special properties of the number 1 and the meaning of exponents, you will be able to rewrite long, complicated expressions into simpler forms. You will then multiply, divide, add, and subtract rational expressions.</p> | <p><b>Solving and Intersections:</b></p> <p>This chapter begins with a focus on two ways to solve equations and systems of equations: algebraically and graphically. You will build on your understanding of solving and solutions from previous courses to gain a broader and stronger understanding of the meaning of solutions.</p> <p>In Section 4.2, you will expand your understanding of solving and solutions to include inequalities. You will solve problems designed to illustrate how inequalities might be used for more complicated applications.</p> | <p><b>Inverses and Logarithms:</b></p> <p>In Chapter 4, one of the strategies that you used to solve complicated equations was Undoing. In this chapter you investigate some new functions that "undo" each other. You will learn about inverse relationships and investigate the relationships between functions and their inverses. You will also learn about compositions of functions.</p> <p>In Section 5.2, you will find the inverses of many parent graphs and add them to the tools you have for working with parent graphs. You will find inverses for exponential functions, which are called logarithmic functions. You will then investigate this family of functions and transform its graphs.</p> | <p><b>3-D Graphing and Logarithms:</b></p> <p>In this chapter, you will learn to extend your mathematical thinking to three dimensions and you will further your understanding of logarithms, which will give you the tools to solve a murder mystery.</p> <p>In the first section, you will expand your understanding of graphing equations and systems of equations to three dimensions and you will broaden your understanding of solutions to include solutions to systems in three dimensions.</p> <p>In Section 6.2, you will return to logarithms to learn more about their properties and why they are useful. You will construct an exponential function to model a situation, and you will use logarithms to solve a mathematical murder mystery.</p> |

| Second Semester Instructional Days | 1           | 2 | 3    | 4 | 5 | 6          | 7          | 8 | 9 | 10 | 11         | 12         | 13 | 14        | 15 | 16        | 17         | 18 | 19        | 20 | 21        | 22 | 23 |  |
|------------------------------------|-------------|---|------|---|---|------------|------------|---|---|----|------------|------------|----|-----------|----|-----------|------------|----|-----------|----|-----------|----|----|--|
| Jan.                               |             |   | Ch 6 |   |   | Chapter 6  |            |   |   |    | Chapter 6  |            |    |           |    | Exam      |            |    | Ch 7      |    | Chapter 7 |    |    |  |
| Feb.                               | Chapter 7   |   |      |   |   | Chapter 7  |            |   |   |    | Ch 7       | Ch 8       |    | Chapter 8 |    |           |            |    | Chapter 8 |    |           |    |    |  |
| March                              | Chapter 8   |   |      |   |   | Chapter 9  |            |   |   |    | Chapter 9  |            |    |           |    | Chapter 9 |            |    |           |    |           |    |    |  |
| April                              | Chapter 10  |   |      |   |   | Chapter 10 |            |   |   |    | Chapter 10 |            |    |           |    | Ch 11     |            |    |           |    | Ch 11     |    |    |  |
| May                                | Chapter 11  |   |      |   |   | 11         | Chapter 12 |   |   |    |            | Chapter 12 |    |           |    |           | Chapter 12 |    |           |    |           |    |    |  |
| June                               | Review/Exam |   |      |   |   |            |            |   |   |    |            |            |    |           |    |           |            |    |           |    |           |    |    |  |

| Chapter 7 (16 days)  | Chapter 8 (15 days)   | Chapter 9 (13 days)   | Chapter 10 (15 days)   | Chapter 11 (12 days)   | Chapter 12 (14 days)  |
|--|---|---|--|--|---|
| <p><b>Trigonometric Functions:</b></p> <p>This chapter begins with an experiment that will generate a new curve. You will then explore the relationship between right-triangle trigonometry and this new curve. You will be introduced to a new representation that is useful for the study of trigonometric functions: a unit circle. You will also learn how to use radians instead of degrees to describe angles.</p> <p>In the second section of this chapter, you will transform trigonometric functions and find general equations for them. You will also learn about a new property that is characteristic of trigonometric functions called a period. Then you will write equations for the curve that you generated in the experiment at the beginning of the chapter.</p> | <p><b>Polynomials:</b></p> <p>In this chapter you will expand your knowledge of families of functions to include polynomial functions. As you investigate the equation <math>\leftrightarrow</math> graph connection for polynomials, you will learn how to search for factors (which can help you find x-intercepts) and how to use division to find additional factors.</p> <p>When you investigate the graphs of polynomials and systems involving polynomials, you will see many that appear not to intersect. As you investigate these systems further, you will learn about imaginary and complex numbers.</p> <p>In the last section of the chapter, you will apply your knowledge of polynomials to model some of the attractions at a county fair.</p> | <p><b>Randomization and Normal Distributions:</b></p> <p>In this chapter you will learn some basic techniques of performing opinion surveys along with their limitations and pitfalls. You will learn why randomness is a cornerstone of statistical studies.</p> <p>In the last section of the chapter, you will create a histogram with percentages called a relative frequency histogram. You will learn a new way to describe the shape of a distribution, and use it to model certain distributions.</p> | <p><b>Series:</b></p> <p>In this chapter you will revisit and add to what you already know about arithmetic and geometric sequences. In Sections 10.1 and 10.2 you will use what you know about sequences and multiple representations to write series and find their sums.</p> <p>In Section 10.3 you will use what you learned about combinations to develop the Binomial Theorem, which is useful for simplifying some algebraic manipulations, as well as solving some probability problems.</p> | <p><b>Simulating Sampling Variability:</b></p> <p>In this chapter, you will use computer simulations to model complex probabilities—probabilities that are often too difficult to compute mathematically. Then you will simulate sample-to-sample variability. Your knowledge of sample-to-sample variability will help you place a margin of error on your predictions about certain characteristics of populations and will help you make statistical decisions.</p> | <p><b>Analytic Trigonometry:</b></p> <p>In Chapter 7 you began your study of trigonometric functions as you learned about radians and how to transform the graphs of <math>y = \sin(x)</math>, <math>y = \cos(x)</math>, and <math>y = \tan(x)</math>. In this chapter, you will continue your study of trigonometry, this time investigating solutions to trigonometric equations. You will learn about three new trigonometric ratios (secant, cosecant, and cotangent) and their corresponding functions</p> <p>By the end of this chapter, you will be able to solve a wide variety of trigonometric equations. You will make statements, based on the unit circle and the graph, about how many solutions there are and why.</p> |

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| Chapter 1        | Chapter 2        | Chapter 3        | Chapter 4        | Chapter 5        | Chapter 6        | Chapter 7        | Chapter 8        | Chapter 9        | Chapter 10       | Chapter 11       | Chapter 12       |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Rec 13 Days      | Rec 18 Days      | Rec 12 Days      | Rec 11 Days      | Rec 11 Days      | Rec 11 Days      | Rec 14 Days      | Rec 13 Days      | Rec 10 Days      | Rec 13 Days      | Rec 10 Days      | Rec 13 days      |
| <u>Standards</u> |
| F-IF.4           | F-IF.4           | A-SSE.1a         | A-SSE.1b         | A-CED.4          | A-CED.2          | F-IF.7e          | N-CN.1           | N-Q.2            | A-SSE.1b         | S-IC.1           | F-IF.7e          |
| F-IF.5           | F-IF.7b          | A-SSE.1b         | A-SSE.2          | F-IF.3           | F-IF.7e          | F-IF.9           | N-CN.2           | S-ID.4           | A-SSE.2          | S-IC.2           | F-IF.8           |
| F-IF.7b          | F-IF.7e          | A-SSE.2          | A-CED.2          | F-IF.4           | F-BF.1b          | F-BF.3           | N-CN.7           | S-IC.1           | A-SSE.4          | S-IC.4           | F-TF.5           |
| F-IF.9           | F-IF.8a          | A-APR.1          | A-CED.3          | F-IF.5           | F-LE.4           | F-TF.1           | N-CN.8           | S-IC.2           | A-APR.4          | S-IC.5           | F-TF.6           |
| F-LE.5           | F-IF.9           | A-APR.4          | A-REI.2          | F-IF.7e          | F-LE.5           | F-TF.2           | N-CN.9           | S-IC.3           | A-APR.5          | S-IC.6           | F-TF.9           |
| MP3              | F-BF.3           | A-APR.7          | A-REI.11         | F-IF.8           | MP1              | F-TF.5           | A-SSE.2          | S-IC.4           | F-IF.8b          | S-MD.6           | MP2              |
|                  | A-SSE.1a         | MP3              | F-IF.5           | F-IF.9           |                  | F-TF.8           | A-APR.2          | S-IC.6           | F-LE.4           | S-MD.7           |                  |
|                  | A-SSE.1b         |                  | F-BF.1b          | F-TF.8           |                  | A-APR.3          | MP6              | MP8              | MP4              |                  |                  |
|                  | A-CED.2          |                  | MP5              | F-BF.3           |                  | A-APR.6          |                  |                  |                  |                  |                  |
|                  | MP4              |                  | F-BF.4a          | F-IF.4           |                  |                  |                  |                  |                  |                  |                  |
|                  |                  |                  | F-LE.4           | F-IF.5           |                  |                  |                  |                  |                  |                  |                  |
|                  |                  |                  | MP7              | F-IF.7c          |                  |                  |                  |                  |                  |                  |                  |
|                  |                  |                  |                  |                  |                  | MP2              |                  |                  |                  |                  |                  |

**Conceptual Categories contained within Algebra 2**

| <u>Number and Quantity</u>   | <u>Algebra</u>   | <u>Functions</u>   | <u>Statistics and Probability</u>   | <u>Mathematical Practice Standards – (MP)</u>  |
|--|--|--|---|--|
| <p><b>Quantities (N-Q)</b></p> <ul style="list-style-type: none"> <li>Reason quantitatively and use units to solve problems</li> </ul> <p><b>The Complex Number System (N-CN)</b></p> <ul style="list-style-type: none"> <li>Perform arithmetic operations with complex numbers</li> <li>Use complex numbers in polynomial identities and equations</li> </ul> | <p><b>Seeing Structure in Expressions (A-SSE)</b></p> <ul style="list-style-type: none"> <li>Interpret the structure of expressions</li> <li>Write expressions in equivalent forms to solve problems</li> </ul> <p><b>Arithmetic with Polynomials and Rational Expressions (A-APR)</b></p> <ul style="list-style-type: none"> <li>Perform arithmetic operations on polynomials</li> <li>Understand the relationship between zeros and factors of polynomials</li> <li>Use polynomial identities to solve problems</li> <li>Rewrite rational expressions</li> </ul> <p><b>Creating Equations (A-CED)</b></p> <ul style="list-style-type: none"> <li>Create equations that describe numbers or relationships</li> </ul> <p><b>Reasoning with Equations and Inequalities (A-REI)</b></p> <ul style="list-style-type: none"> <li>Understand solving equations as a process of reasoning and explain the reasoning</li> <li>Represent and solve equations and inequalities graphically</li> </ul> | <p><b>Interpreting Functions (F-IF)</b></p> <ul style="list-style-type: none"> <li>Understand the concept of a function and use function notation</li> <li>Interpret functions that arise in applications in terms of the context</li> <li>Analyze functions using different representations</li> </ul> <p><b>Building Functions (F-BF)</b></p> <ul style="list-style-type: none"> <li>Build a function that models a relationship between two quantities</li> <li>Build new functions from existing functions</li> </ul> <p><b>Linear, Quadratic, and Exponential Models (F-LE)</b></p> <ul style="list-style-type: none"> <li>Construct and compare linear, quadratic, and exponential models and solve problems</li> <li>Interpret expressions for functions in terms of the situation they model</li> </ul> <p><b>Trigonometric Functions (F-TF)</b></p> <ul style="list-style-type: none"> <li>Extend the domain of trigonometric functions using the unit circle</li> <li>Model periodic phenomena with trigonometric functions</li> <li>Prove and apply trigonometric identities</li> </ul> | <p><b>Interpreting Categorical and Quantitative Data (S-ID)</b></p> <ul style="list-style-type: none"> <li>Summarize, represent, and interpret data on a single count or measurement variable</li> </ul> <p><b>Making Inferences and Justifying Conclusions (S-IC)</b></p> <ul style="list-style-type: none"> <li>Understand and evaluate random processes underlying statistical experiments</li> <li>Make inferences and justify conclusions from sample surveys, experiments and observational studies</li> </ul> <p><b>Using Probability to Make Decisions (S-MD)</b></p> <ul style="list-style-type: none"> <li>Use probability to evaluate outcomes of decisions</li> </ul> | <ol style="list-style-type: none"> <li>Make sense of problems and persevere in solving them.</li> <li>Reason abstractly and quantitatively.</li> <li>Construct viable arguments and critique the reasoning of others.</li> <li>Model with mathematics.</li> <li>Use appropriate tools strategically.</li> <li>Attend to precision.</li> <li>Look for and make use of structure.</li> <li>Look for and express regularity in repeated reasoning.</li> </ol> |