**Algebra 2 CPM**

**Instructional Plan 2014-2015**

**Mathematics Instructional Plan Writing Committee**

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| |  |  |  |  | | --- | --- | --- | --- | | **School Board Members:**  Karen Almond  Tina Calderone, Ed.D.  Amy Lockhart  Dede Schaffner  **Superintendent:**  Dr. Walt Griffin  **Deputy Superintendent:**  Dr. Anna-Marie Cote  **Secondary Executive Directors:**  Dr. Michael Blasewitz  Dr. Robin Dehlinger  **Department of Teaching and Learning**  Dr. Corbet Wilson  Diana Barnett | **Middle School Contributors:**  Sandy Baldorossi – TWMS  Jennifer Bennett – MKMS  Patty Bouington – SMS  Allison Child – SMS  Diane Firios – SSMS  Mary Ellen Freeman – MMMS  Sara Gibbs – MWMS  Kelly Goodearl – ITMS  Kim Hamilton – ITMS  LeeAnn Heldmyer – TWMS  Joni Hudson – SMS  Stephanie Johnson – MMMS  Beth Karnes – ITMS  Adam Kiefer – SSMS  Elena Lugo – RLMS  Jennifer Manwaring – TWMS  Stuart Milchman – MMMS  Lisa Morris – MMMS  Michelle Mouton – JHMS  Misty Naran – LCMS | Triscia Panarello – SMS  Sabrina Robinson – MWMS  Robyn Smith – MKMS  Erica Sowpel – SMS  Kristen Springfield – MKMS  Jennifer Stickle – MMMS  Deborah Velez – LCMS  Dennis Whalen – ITMS  Barbie Wigen – MMMS  Agnes Wong – SMS | **High School Contributors:**  Ryan Beasley – LMHS  Susan Brown – LHS  Brittany Campbell – HHS  Aglaia Christodoulides - HHS  Katie Donoghue - LMHS  Lauren Fedi - OHS  Matt Guglielmello – OHS  David Hiller – LMHS  Saida Hussien – OHS  Amy Jones – LBHS  Mia Keyeser – LMHS  Angela-Mia Kilmer – OHS  Jeffrey Miller – LBHS  Karen Neukamm – LBHS  Laura Pollard – LHS  Jonathan Rodriguez – HHS  Kristina Rudich – LMHS  Lesley Schmidt – WSHS  Erica Segrest – OHS  Sharon Shyrock – LHS  Lynn Webb – LHHS  Betty Westhelle – OHS | |  |  |  |

We would like to express our appreciation for the time, effort and expertise contributed to the writing of the secondary Mathematics Instructional Plans by our team of Seminole County math teachers.

**Purpose:**

The purpose of the Seminole County Public Schools Instructional Plan is to present an organized, responsible strategy of Benchmark presentation that incorporates Mathematics Formal Standards (MAFS) standards. This document will serve as a guide for teachers of mathematics. Latitude in the execution of this document shall be determined by a school rather than by an individual teacher.

**Goals:**

* To establish a classroom environment that values mathematical student discourse
* To engage students in cognitively challenging mathematical tasks
* To promote discussions that focus on student thinking, reasoning, problem solving and student presentation
* To build on student thinking while ensuring the discussion remains focused on the mathematical ideas of the lesson
* Employ questioning techniques that require students to justify, defend and support their ideas

**Instructional Plan Caveats:**

* Suggested practice corresponds to the associated lesson and left at the discretion of the instructor to be used as additional practice or assignment. Problems within the suggested pages may be exhausted or selected for targeted skills.
* Descriptions of the Mathematical Practices can be found on pages 3 – 4. Teachers are encouraged to embed the Questions to Develop Mathematical Thinking on pages 5 – 6 in their daily lessons.
* Learning goals and scales can be accessed through the hyperlinks within the Instructional Plan.
* Each learning scale will include links for formative assessment tasks that teachers are encouraged to use while students are progressing through the learning scale.
* Teachers are encouraged to use appropriate questioning strategies to fully address the instructional standards and expectations, by paying attention to the recommended caveats included throughout the IP to include discussion that may not be included as part of the textbook.
* Please look ahead and plan accordingly for time and copy needs that may arise throughout this year so that all MAFS standards are thoroughly addressed.
* Due to the fact that we do not have Test Item Specifications at this time the targeted Mathematical Practices for each unit are a projection.
* **Common Assessments need to be readdressed by PLCs to fit the new units and fully address the standards.**
* **Each unit will include at least one learning goal listed under the unit heading. The learning goals and scales correspond to the grade/level specific clusters as defined by the MAFS.**
* **The learning goals and scales are a work in progress and may be modified as needed. They are meant to be a starting point for PLCs to use as they customize the learning goals and scales to best demonstrate student learning.**

**Test Items Specifications:** [fsassessments.org](http://fsassessments.org/)

**STANDARDS FOR MATHEMATICAL PRACTICE**

1. **(MAFS.K12.MP.1.1) Make sense of problems and persevere in solving them.**

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

1. **(MAFS.K12.MP.2.1) Reason abstractly and quantitatively.**

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

**3. (MAFS.K12.MP.3.1) Construct viable arguments and critique the reasoning of others.**

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

**4. (MAFS.K12.MP.4.1) Model with mathematics.**

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

**5. (MAFS.K12.MP.5.1) Use appropriate tools strategically.**

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

**6. (MAFS.K12.MP.6.1) Attend to precision.**

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, student’s give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

**7. (MAFS.K12.MP.7.1) Look for and make use of structure.**

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7 × 8 equals the well-remembered 7 × 5 + 7 × 3, in preparation for learning about the distributive property. In the expression *x*2 + 9*x* + 14, older students can see the 14 as 2 × 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see 5 – 3(*x* – *y*) 2 as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers *x* and *y*.

**8. (MAFS.K12.MP.8.1) Look for and express regularity in repeated reasoning.**

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation (*y* – 2)/(*x* – 1) = 3. Noticing the regularity in the way terms cancel when expanding (*x* – 1)(*x* + 1), (*x* – 1)(*x*2 + *x* + 1), and (*x* – 1)(*x*3 + *x*2 + *x* + 1) might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

| **Summary of Standards for Mathematical Practice** | **Questions to Develop Mathematical Thinking** |
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| **1. Make sense of problems and persevere in solving them.** | |
| * Interpret and make meaning of the problem to find a starting point. Analyze what is given in order to explain to them the meaning of the problem. * Plan a solution pathway instead of jumping to a solution. * Monitor their progress and change the approach if necessary. * See relationships between various representations. * Relate current situations to concepts or skills previously learned and connect mathematical ideas to one another. * Continually ask them, “Does this make sense?” Can understand various approaches to solutions. | * How would you describe the problem in your own words? * How would you describe what you are trying to find? * What do you notice about...? * What information is given in the problem? * Describe the relationship between the quantities. * Describe what you have already tried. What might you change? * Talk me through the steps you’ve used to this point. * What steps in the process are you most confident about? * What are some other strategies you might try? * What are some other problems that are similar to this one? * How might you use one of your previous problems to help you begin? * How else might you organize...represent... show...? |
| **2. Reason abstractly and quantitatively.** | |
| * Make sense of quantities and their relationships. * Decontextualize (represent a situation symbolically and manipulate the symbols) and contextualize (make meaning of the symbols in a problem) quantitative relationships. * Understand the meaning of quantities and are flexible in the use of operations and their properties. * Create a logical representation of the problem. * Attends to the meaning of quantities, not just how to compute them. | * What do the numbers used in the problem represent? * What is the relationship of the quantities? * How is \_\_\_\_\_\_\_ related to \_\_\_\_\_\_\_\_? * What is the relationship between \_\_\_\_\_\_and \_\_\_\_\_\_? * What does\_\_\_\_\_\_\_mean to you? (e.g. symbol, quantity, diagram) * What properties might we use to find a solution? * How did you decide in this task that you needed to use...? * Could we have used another operation or property to solve this task? Why or why not? |
| **3. Construct viable arguments and critique the reasoning of others.** | |
| * Analyze problems and use stated mathematical assumptions, definitions, and established results in constructing arguments. * Justify conclusions with mathematical ideas. * Listen to the arguments of others and ask useful questions to determine if an argument makes sense. * Ask clarifying questions or suggest ideas to improve/revise the argument. * Compare two arguments and determine correct or flawed logic. | * What mathematical evidence would support your solution? * How can we be sure that...? / How could you prove that...? * Will it still work if...? * What were you considering when...? * How did you decide to try that strategy? * How did you test whether your approach worked? * How did you decide what the problem was asking you to find? (What was unknown?) * Did you try a method that did not work? Why didn’t it work? Would it ever work? Why or why not? * What is the same and what is different about...? * How could you demonstrate a counter-example? |
| **4. Model with mathematics.** | |
| * Understand this is a way to reason quantitatively and abstractly (able to decontextualize and contextualize). * Apply the mathematics they know to solve everyday problems. * Are able to simplify a complex problem and identify important quantities to look at relationships. * Represent mathematics to describe a situation either with an equation or a diagram and interpret the results of a mathematical situation. * Reflect on whether the results make sense, possibly improving/revising the model. * Ask them, “How can I represent this mathematically?” | * What number model could you construct to represent the problem? * What are some ways to represent the quantities? * What is an equation or expression that matches the diagram, number line..., chart..., table..? * Where did you see one of the quantities in the task in your equation or expression? * How would it help to create a diagram, graph, and table...? * What are some ways to visually represent...? * What formula might apply in this situation? |

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| **5. Use appropriate tools strategically.** | |
| * Use available tools recognizing the strengths and limitations of each Unit * Use estimation and other mathematical knowledge to detect possible errors. * Identify relevant external mathematical resources to pose and solve problems. * Use technological tools to deepen their understanding of mathematics. | * What mathematical tools could we use to visualize and represent the situation? * What information do you have? * What do you know that is not stated in the problem? * What approach are you considering trying first? * What estimate did you make for the solution? * In this situation would it be helpful to use...a graph..., number line..., ruler..., diagram..., calculator..., manipulative? * Why was it helpful to use...? * What can using a \_\_\_\_\_\_ show us that \_\_\_\_\_may not? * In what situations might it be more informative or helpful to use...? |
| **6. Attend to precision.** | |
| * Communicate precisely with others and try to use clear mathematical language when discussing their reasoning. * Understand the meanings of symbols used in mathematics and can label quantities appropriately. * Express numerical answers with a degree of precision appropriate for the problem context. * Calculate efficiently and accurately. | * What mathematical terms apply in this situation? * How did you know your solution was reasonable? * Explain how you might show that your solution answers the problem. * What would be a more efficient strategy? * How are you showing the meaning of the quantities? * What symbols or mathematical notations are important in this problem? * What mathematical language...,definitions..., properties can you use to explain...? * How could you test your solution to see if it answers the problem? |
| **7. Look for and make use of structure.** | |
| * Apply general mathematical rules to specific situations. * Look for the overall structure and patterns in mathematics. * See complicated things as single objects or as being composed of several objects. | * What observations do you make about...? * What do you notice when...? * What parts of the problem might you eliminate.., simplify..? * What patterns do you find in...? * How do you know if something is a pattern? * What ideas that we have learned before were useful in solving this problem? * What are some other problems that are similar to this one? * How does this relate to...? * In what ways does this problem connect to other mathematical concepts? |
| **8. Look for and express regularity in repeated reasoning.** | |
| * See repeated calculations and look for generalizations and shortcuts. * See the overall process of the problem and still attend to the details. * Understand the broader application of patterns and see the structure in similar situations. * Continually evaluate the reasonableness of their intermediate results | * Explain how this strategy works in other situations? * Is this always true, sometimes true or never true? * How would we prove that...? * What do you notice about...? * What is happening in this situation? * What would happen if...? * Is there a mathematical rule for...? * What predictions or generalizations can this pattern support? * What mathematical consistencies do you notice? |

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| **FIRST QUARTER (August 11 – October 9)** | | **42 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Topic/Assessment** |
| Unit 1: Investigations and Functions |  | 12 |
| Unit 2: Sequences and Equivalence |  | 13 |
| Unit 3: Exponential Functions |  | 14 |
| District Assessment (1 day), 9 Weeks Exams (2 days) |  | 3 |
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| **SECOND QUARTER (October 13 – December 18)** | | **46 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Topic/Assessment** |
| Unit 4: Transformations of Parent Graphs |  | 15 |
| Unit 5: Solving and Intersections |  | 12 |
| Unit 6: Inverses and Logarithms (along with Chapter 7, Section 2) |  | 15 |
| District Assessment (1 day); 9 Weeks Exams (3 days) |  | 4 |
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| **THIRD QUARTER (January 6 – March 12)** | | **46 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Topic/Assessment** |
| Unit 7: Polynomials |  | 21 |
| Unit 8: Trigonometric Functions including 13-94a, 13-102, 13-103 |  | 22 |
| District Assessment (1 day); 9 Weeks Exams (2 days) |  | 3 |
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| **FOURTH QUARTER (March 23 – May 27)** | | **46 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Topic/Assessment** |
| Unit 9: Probability |  | 12 |
| Unit 10: The design of statistical studies |  | 10 |
| Unit 11: Gathering data, making inferences, and justifying conclusions |  | 14 |
| FSA Tests (7 days); 9 Weeks Exams (3 days) |  | 10 |

*\*Please note that the suggested number of instructional days per unit and quarter are designed to be a guide. Teachers are encouraged to work within their schools and their PLCs to make the most appropriate timing decisions for their students.\**

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| **FIRST QUARTER** | | | | | | | | |
| **Unit 1: Investigation and Functions** | | | | | | | | |
| **Learning Goals** | **A208:** Interpret functions that arise in real-world context, including restricting domain/range, and interpreting average rate of change. | | | | | | **# Days** | **12** |
| **Standards** | **FL Coding** | **Standards** | | | | | | |
| F-IF.2.4  F-IF.2.5 | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; and periodicity.  Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function. | | | | | | |
|  | F-IF.3.9 | Compare properties of the two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum. | | | | | | |
|  | A-CED.1.4  A-REI.1.1 | Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm’s law V = IR to highlight resistance R.  Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. | | | | | | |
| **Mathematical Practices** | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | 2. Reason abstractly and quantitatively. | 3. Construct viable arguments and critique the reasoning of others. | 4. Model with mathematics. | 5. Use appropriate tools strategically. | | 6. Attend to precision. | 7. Look for and make use of structure. | 8. Look for and express regularity in repeated reasoning. |
| **Suggested Days** | **Lesson Objective (Instructional Resources)** | | | | **Suggested Assignments/Assessments** | | **Supplementary Materials** | |
| 1 | 1.1.1: Solving Puzzles in Teams | | | |  | |  | |
| 1 | 1.1.2: Using a Graphing Calculator to Explore a Function | | | |  | |  | |
| 1 | 1.1.3: Domain and Range | | | | Include 1-38 | |  | |
| 1 | 1.1.4: Points of Intersection in Multiple Representations | | | |  | |  | |
| 1 | 1.2.1: Modeling a Geometric Relationship | | | | Include 1-72 | |  | |
| 2 | 1.2.2: Function Investigation | | | | Include 1-88 | |  | |
| 1 | 1.2.3: Family of Linear Functions | | | |  | |  | |
| 1 | 1.2.4: Function Investigation Challenge | | | |  | |  | |
| 3 | Closure/ Assessment | | | |  | |  | |

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| **FIRST QUARTER** | | | | | | | | | | | | | |
| **Unit 2: Sequences and Equivalence** | | | | | | | | | | | | | |
| **Learning Goals** | **A201:** Understand the relationship between zeros and factors of polynomials and use and prove polynomial identities to rewrite expressions  **A205:** Find patterns and structure in polynomial and rational expressions. | | | | | | | | | | **# Days** | | **13** |
| **Standards** | **FL Coding** | | | **Standards** | | | | | | | | | |
| F-IF.3.8b  A-SSE.1.1  A-SSE.1.2  A-SSE.2.4  A-SSE.2.3c  A-REI.1.1  A-REI.1.2  A-APR.1.1  A-APR.3.4  A-CED.1.1  F-BF.1.1a  F-BF.1.2 | | | Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y=(1.02)t, y=(0.97)t, y=(1.01)12t, y=(1.2)t/10, and classify them as exponential growth or decay.  Interpret expressions that represent a quantity in terms of its context.   1. Interpret parts of an expression, such as terms, factors, and coefficients. 2. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret   P(1 + r)n as the product of P and a factor not depending on P.  Use the structure of an expression to identify ways to rewrite it. For example, see *x4 – y4* as (*x2)2 – (y2)2* thus recognizing it as a difference of squares that can be factored as (*x2 – y2)( x2 + y2)*  Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.  Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Use the properties of exponents to transform expressions for exponential functions. *For example the expression 1.15t can be rewritten as (1.15t/12)12t = 1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*  Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.  Solve simple rational equations in one variable, and give examples showing how extraneous solutions may arise.  Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.  Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity  *(x2 + y2)2= ( x2 - y2)2 + (2xy)2* can be used to generate Pythagorean triples.  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, quadratic functions, and simple rational, absolute, and exponential functions.  Determine an explicit expression, a recursive process, or steps for calculation from a context.  Write arithmetic and geometric sequences both recursively, and with an explicit formula, use them to model situations, and translate between the two forms. | | | | | | | | | |
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| **Mathematical Practices** | | | | | | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | | | 2. Reason abstractly and quantitatively. | | 3. Construct viable arguments and critique the reasoning of others. | 4. Model with mathematics. | 5. Use appropriate tools strategically. | | 6. Attend to precision. | 7. Look for and make use of structure. | | 8. Look for and express regularity in repeated reasoning. | |
| **Suggested Days** | | **Lesson Objective (Instructional Resources)** | | | | | | **Suggested Assignments/Assessments** | | | **Supplementary Materials** | | |
| 1 | | 2.1.1: Representing Exponential Growth | | | | | |  | | |  | | |
| 1 | | 2.1.2: Rebound Ratios | | | | | |  | | |  | | |
| 1 | | 2.1.3: The Bouncing Ball and Exponential Decay | | | | | |  | | |  | | |
| 1 | | 2.1.4: Generating and Investigating Sequences | | | | | | Include 2-49 | | |  | | |
| 1 | | 2.1.5: Generalizing Arithmetic Sequences | | | | | | Include 2-66 and 2-71 | | |  | | |
| 1 | | 2.1.6: Using Multipliers to Solve Problems | | | | | |  | | |  | | |
| 1 | | 2.1.7: Comparing Sequences and Functions | | | | | | Include 2-103 | | |  | | |
| 1 | | 2.1.8: Sequences that Begin with n = 1 | | | | | |  | | |  | | |
| 1 | | 2.2.2: Area Models and Equivalent Expressions | | | | | | Include 2-135 | | |  | | |
| 2 | | 2.2.3: Solving by Rewriting  Include (with appropriate contextual problems) the following: | | | | | | Include 2-152 | | |  | | |
| 2 | | Closure/Assessment | | | | | |  | | |  | | |

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| **FIRST QUARTER** | | | | | | | | |
| **Unit 3: Exponential Functions** | | | | | | | | |
| **Learning Goals** | **A209:** Graph and write equivalent forms of functions by hand and using technology, and compare functions in different representations. | | | | | | **# Days** | **14 (3)** |
| **Standards** | **FL Coding** | **Standards** | | | | | | |
| F-IF.3.7e  F-IF.3.8b  F-IF.3.9  A-CED.1.1  F-LE.2.5  N-Q.1.2 | Graph exponential functions, showing intercepts and end-behavior..  Use the properties of exponents to interpret expressions for exponential functions. *For example, identify percent rate of change in functions such as y =Capture, y =Capture1, y =Capture4, y =Capture3, and classify them as representing exponential growth or decay.*  Compare properties of the two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, quadratic functions, and simple rational, absolute, and exponential functions.  Interpret the parameters in a linear or exponential function in terms of a context  Define appropriate quantities for the purpose of descriptive modeling. | | | | | | |
| **Mathematical Practices** | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | 2. Reason abstractly and quantitatively. | 3. Construct viable arguments and critique the reasoning of others. | 4. Model with mathematics. | 5. Use appropriate tools strategically. | | 6. Attend to precision. | 7. Look for and make use of structure. | 8. Look for and express regularity in repeated reasoning. |
| **Suggested Days** | **Lesson Objective (Instructional Resources)** | | | | **Suggested Assignments/Assessments** | | **Supplementary Materials** | |
| 1 | 3.1.1: Investigation *y=bx* | | | |  | |  | |
| 1 | 3.1.2: Multiple Representations | | | |  | |  | |
| 1 | 3.1.3: More Applications of Exponential Growth | | | | Include 3-42 | |  | |
| 2 | 3.1.4: Exponential Decay | | | |  | | Use Randint on calculator | |
| 1 | 3.1.5: Graph → Rule | | | |  | |  | |
| 1 | 3.1.6: Completing the Web | | | |  | |  | |
| 1 | 3.2.1: Curve Fitting and Fractional Exponents | | | |  | |  | |
| 1 | 3.2.2: More Curve Fitting | | | |  | |  | |
| 2 | 3.2.3: Solving a System of Exponential Functions Graphically | | | |  | |  | |
| 3 | Closure/ Assessment | | | |  | |  | |
|  | **District Assessment** (1 day) | | | | | | | |
|  | **Nine Week Exam/Review** (2 days) | | | | | | | |

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| **SECOND QUARTER** | | | | | | | | | | | | | |
| **Unit 4: Transformations of Parent Graphs** | | | | | | | | | | | | | |
| **Learning Goals** | **A206:** Apply transformation rules to polynomial, exponential, logarithmic, trigonometric functions, as well as graphing basic inverse functions.  **A209:** Graph and write equivalent forms of functions by hand and using technology, and compare functions in different representations. | | | | | | | | | | **# Days** | | **15** |
| **Standards** | **FL Coding** | | **Standards** | | | | | | | | | | |
| F-IF.3.7a  F-IF.3.7b  F-IF.3.7e  F-IF.3.8a  F-BF.2.3  A-CED.1.1  A-REI.2.4a  A-SSE.2.3  G-GPE.1.2 | | Graph linear and quadratic functions and show intercepts, maxima, and minima.  Graph piecewise-defined functions, including step functions and absolute value functions.  Graph exponential and logarithmic functions, howing intercepts and end behavior  Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.  Use the process of factoring and completing the square in a quadratic function to show zeroes, extreme values, and symmetry of the graph, and interpret these in terms of a context.  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions.  Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)² = q that has the same solutions. Derive the quadratic formula from this form.  Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.  Derive the equation of a parabola given a focus and directrix. | | | | | | | | | | |
| **Mathematical Practices** | | | | | | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | | 2. Reason abstractly and quantitatively. | | 3. Construct viable arguments and critique the reasoning of others. | | 4. Model with mathematics. | 5. Use appropriate tools strategically. | | 6. Attend to precision. | 7. Look for and make use of structure. | | 8. Look for and express regularity in repeated reasoning. | |
| **Suggested Days** | **Lesson Objective (Instructional Resources)** | | | | **Suggested Assignments/Assessments** | | | **Supplementary Materials** | | | | | |
| 1 | 4.1.1: Modeling Non-Linear Data | | | |  | | | Include deriving equation given focus and directrix (see Alg 2 Honors book, section 10.2 pg.623) | | | | | |
| 2 | 4.1.2: Parabola Investigation | | | | Include 4-25 | | |  | | | | | |
| 1 | 4.1.3: Graphing a Parabola without a Table | | | |  | | |  | | | | | |
| 1 | 4.1.4: Mathematical Modeling with Parabolas | | | |  | | |  | | | | | |
| 2 | 4.2.1: Transforming Other Parent Graphs  Piecewise Functions | | | | Include 4-69, 4-80  Do Checkpoint #7 after 4-80 | | | Piecewise functions: Algebra 2 Honors book, Concept Byte pg. 90-91 | | | | | |
| 1 | 4.2.2: Describing *(h,k)* for Each Family of Functions | | | |  | | |  | | | | | |
| 1 | 4.2.3: Transforming the Absolute Value Parent Graph | | | |  | | |  | | | | | |
| 1 | 4.2.4: Transforming Non-Functions | | | |  | | |  | | | | | |
| 2 | 4.3.1: Completing the Square | | | |  | | |  | | | | | |
| 3 | Closure/ Assessment | | | |  | | |  | | | | | |

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| **SECOND QUARTER** | | | | | | | | | | | | | | |
| **Unit 5: Transformations of Parent Graphs** | | | | | | | | | | | | | | |
| **Learning Goals** | **A202:** Create equations that represent real-world mathematical relationships, including constraints and literal equations.  **A204:** Solve systems of linear and quadratic equations (including 3x3 systems) | | | | | | | | | | | **# Days** | | **12** |
| **Standards** | **FL Coding** | | | **Standards** | | | | | | | | | | |
| A-CED.1.1  A-CED.1.2  A-CED.1.3  A-CED.1.4  A-REI.1.1  A-REI.1.2  A-REI.3.6  A-REI.3.7  A-REI.4.11 | | | Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, quadratic functions, and simple exponential functions.  Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.  Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.  Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm’s law V = IR to highlight resistance R.  Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.  Solve simple radical equations in one variable, and give examples showing how extraneous solutions may arise.  Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.  Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically*.*  Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, absolute value, exponential, and logarithmic functions. | | | | | | | | | | |
| **Mathematical Practices** | | | | | | | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | | | 2. Reason abstractly and quantitatively. | | 3. Construct viable arguments and critique the reasoning of others. | 4. Model with mathematics | | 5. Use appropriate tools strategically. | 6. Attend to precision. | 7. Look for and make use of structure. | | | 8. Look for and express regularity in repeated reasoning. | |
| **Suggested Days** | | **Lesson Objective (Instructional Resources)** | | | | | **Suggested Assignments/Assessments** | | | | **Supplementary Materials** | | | |
| 1 | | 5.1.1: Strategies for Solving Equations | | | | |  | | | | Supplement extraneous solutions | | | |
| 2 | | 5.1.2: Solving equations and Systems Graphically | | | | | Include 5-29 | | | |  | | | |
| 1 | | 5.1.3: Finding Multiple Solutions to Systems of Equations | | | | | Include 5-43 | | | |  | | | |
| 1 | | 5.1.4: Using Systems of Equations to Solve Problems | | | | |  | | | |  | | | |
| 2 | | 5.2.1: Solving Inequalities with One or Two Variables | | | | |  | | | |  | | | |
| 1 | | 5.2.2: Using Systems to Solve a Problem | | | | |  | | | |  | | | |
| 1 | | 5.2.3: Applications of Systems of Linear Inequalities | | | | | Include 5-89 | | | |  | | | |
| 1 | | 5.2.4: Using Graphs to Find Solutions | | | | |  | | | |  | | | |
| 2 | | Closure/ Assessment | | | | |  | | | |  | | | |

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| **SECOND QUARTER** | | | | | | | | | | |
| **Unit 6: Inverses and Logarithms** | | | | | | | | | | |
| **Learning Goals** | | **A203:** Solve simple rational and radical equations including justifications and extraneous solutions.  **A207:** Construct, compare, and interpret exponential and logarithmic models, including building functions that model a relationship from an arithmetic, geometric or recursive sequence or series. | | | | | | **# Days** | | **15 (4)** |
| **Standards** | | **FL Coding** | **Standards** | | | | | | | |
| F-IF.2.4  F-IF.3.7b  F-IF.3.7e  F-BF.1.1b  F-BF.2.4    F-BF.2.a  F-LE.1.4  F-LE.2.5  N-RN.1.1  N-RN.1.2 | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior.  Graph square root, cube root functions, including step functions and absolute value functions.  Graph exponential and logarithmic functions, showing intercepts and end behavior.  Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential and relate these functions to the model.  Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) = 2 or f(x) = (x+1)/(x-1) for x 1.  Use the change of base formula.  For exponential models, express as a logarithm the solution to *abct = d* where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.  Interpret the parameters in a linear or exponential function in terms of a context.  Define appropriate quantities for the purpose of descriptive modeling.  Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define 51/3 to be the cube root of 5 because we want (51/3)3 = (51/3)3 to hold, so (51/3)3 must equal 5.*  Rewrite expressions involving radicals and rational exponents using the properties of exponents. | | | | | | | |
| **Mathematical Practices** | | | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | | 2. Reason abstractly and quantitatively. | 3. Construct viable arguments and critique the reasoning of others. | 4. Model with mathematics. | | 5. Use appropriate tools strategically. | 6. Attend to precision. | 7. Look for and make use of structure. | | 8. Look for and express regularity in repeated reasoning. |
| **Suggested Days** | **Lesson Objective (Instructional Resources)** | | | | **Suggested Assignments/Assessments** | | | | **Supplementary Materials** | |
| 2 | 6.1.1: “Undo” Rules | | | |  | | | |  | |
| 2 | 6.1.2: Using a Graph to find an Inverse | | | | Include 6-26 | | | |  | |
| 1 | 6.1.3: Finding Inverses and Justifying Algebraically | | | |  | | | |  | |
| 1 | 6.2.1: Finding the Inverse of an Exponential Function | | | |  | | | |  | |
| 1 | 6.2.2: Defining the Inverse of an Exponential Function | | | |  | | | |  | |
| 1 | 6.2.3: Investigation the Family of Logarithmic Functions | | | |  | | | |  | |
| 1 | 6.2.4: Transformations of Log Graphs | | | |  | | | |  | |
| 1 | 7.2.1: Using Logarithms to Solve Exponential Equations | | | |  | | | |  | |
| 1 | 7.2.3: Writing Equations of Exponential Functions | | | |  | | | |  | |
| 1 | 7.2.4: An Application of Logarithms | | | |  | | | |  | |
| 3 | Closure/ Assessment | | | |  | | | |  | |
|  | **District Assessment** (1 day) | | | | | | | | | |
|  | **Nine Week Exam/Review** (3 days) | | | | | | | | | |

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| **THIRD QUARTER** | | | | | | | | | | | | | | |
| **Unit 7: Polynomial Functions** | | | | | | | | | | | | | | |
| **Learning Goals** | | **A212:** Derive complex solutions from quadratic functions, and perform operations on complex numbers. | | | | | | | | | | | **# Days** | **21** |
| **Standards** | | **FL Coding** | | **Standards** | | | | | | | | | | |
| N-CN.1.2  N-CN.1.1  N-CN.3.7  A-SSE.1.1  A-APR.2.2  A-APR.2.3  A-APR.4.6  F-IF.2.4  F-IF.2.6  F-IF.3.7.c  A-REI.2.4b | | Use the relation *i*2 = −1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.  Know there is a complex number, *i,* such that *i*2 = −1 and every complex number has the form a + bi with a and b real  Solve quadratic equations with real coefficients that have complex solutions.  Interpret expressions that represent a quantity in terms of its context.   * Interpret parts of an expression, such as terms, factors, and coefficients.   Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).  Identify zeroes of polynomials when suitable factorizations are available, and use the zeroes to construct a rough graph of the function defined by the polynomial.  Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.  For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior.  Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.  Graph polynomial functions, identifying zeroes when suitable factorizations are available, and showing end behavior.  Solve quadratic equations in one variable.  b. Solve quadratic equations by inspection ( e.g., for ), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a bi for real numbers a and b. | | | | | | | | | | |
| **Mathematical Practices** | | | | | | | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | | | 2. Reason abstractly and quantitatively. | | 3. Construct viable arguments and critique the reasoning of others. | 4. Model with mathematics. | | 5. Use appropriate tools strategically. | 6. Attend to precision. | 7. Look for and make use of structure. | | 8. Look for and express regularity in repeated reasoning. | | |
| **Suggested Days** | **Lesson Objective (Instructional Resources)** | | | | | | **Suggested Assignments/Assessments** | | | | **Supplementary Materials** | | | |
| 3 | 9.1.1: Sketching Graphs of Polynomial Functions | | | | | |  | | | |  | | | |
| 2 | 9.1.2: More Graphs of Polynomials | | | | | |  | | | |  | | | |
| 2 | 9.1.3: Stretch Coefficients for Polynomial Functions | | | | | |  | | | |  | | | |
| 2 | 9.2.1: Introducing Imaginary Numbers | | | | | |  | | | |  | | | |
| 1 | 9.2.2: Complex Roots | | | | | |  | | | |  | | | |
| 1 | 9.2.3: More Complex Numbers and Equations | | | | | |  | | | |  | | | |
| 3 | 9.3.1: Polynomial Division | | | | | |  | | | |  | | | |
| 3 | 9.3.2: Factors and Integral Roots | | | | | |  | | | |  | | | |
| 2 | Rate of Change | | | | | | Pg. 15-34 # 9-1 through 9-5  TE Pg. 23-42 | | | |  | | | |
| 2 | Closure/ Assessment | | | | | |  | | | |  | | | |

**For “Rate of Change”, student text can be found here:** <http://www.cpm.org/pdfs/standards/CCSS/CCSS%20A2C%20student%20V1.1.pdf>

**For “Rate of Change”, teacher text can be found here:** <http://www.cpm.org/pdfs/standards/CCSS/CCSS%20A2C%20teacher%20V1.1.pdf>

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| **THIRD QUARTER** | | | | | | | | | | | | | | |
| **Unit 8: Trigonometric Functions** | | | | | | | | | | | | | | |
| **Learning Goals** | **A211:** Model periodic phenomena using the unit circle and trigonometric functions. Prove and apply trigonometric identities. | | | | | | | | | | | **# Days** | | **22 (4)** |
| **Standards** | **FL Coding** | | | **Standards** | | | | | | | | | | |
| A-CED.1.1  F-IF.3.7e  F-IF.3.9  F-TF.1.1  F-TF.1.2  F-TF.2.5  F-TF.3.8 | | | Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, and simple functions.  Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude, and using phase shift.  Compare properties of the two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.  Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle; Convert between degrees and radians.  Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.  Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.  Prove the Pythagorean identity and use it to find sin(), cos(), or tan() and the quadrant of the angle. | | | | | | | | | | |
| **Mathematical Practices** | | | | | | | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | | | 2. Reason abstractly and quantitatively. | | 3. Construct viable arguments and critique the reasoning of others. | 4. Model with mathematics. | 5. Use appropriate tools strategically. | | 6. Attend to precision. | 7. Look for and make use of structure. | | | 8. Look for and express regularity in repeated reasoning. | |
| **Suggested Days** | | **Lesson Objective (Instructional Resources)** | | | | | | **Suggested Assignments/Assessments** | | | **Supplementary Materials** | | | |
| 2 | | 8.1.1: Introduction to Cyclic Models | | | | | |  | | |  | | | |
| 3 | | 8.1.2: Graphing the Sine Function  8.1.3: Unit circle ↔ Graph | | | | | | Include 8-18 | | |  | | | |
| 2 | | 8.1.4: Graphing and Interpreting the Cosine Function | | | | | |  | | |  | | | |
| 2 | | 8.1.5: Defining a Radian | | | | | |  | | |  | | | |
| 1 | | 8.1.6: Building a Unit Circle | | | | | |  | | |  | | | |
| 2 | | 8.1.7: The Tangent Function | | | | | |  | | |  | | | |
| 1 | | 8.2.1: Transformations of *y = sin x* | | | | | | Include 8-119 | | |  | | | |
| 1 | | 8.2.2: Period of a Cyclic Function | | | | | | Include 8-124 | | |  | | | |
| 2 | | 8.2.3: Period of a Cyclic Function | | | | | |  | | |  | | | |
| 1 | | 8.2.4: Graph ↔ Equation | | | | | | Include 8-156 | | |  | | | |
| 2 | | 13-94; 13-102; 13-103 | | | | | |  | | |  | | | |
| 3 | | Closure/ Assessment | | | | | |  | | |  | | | |
|  | | **FLA ELA/Writing** (1 day) | | | | | | | | | | | | |
|  | | **District Assessment** (1 day) | | | | | | | | | | | | |
|  | | **Nine Week Exam/Review** (2 days) | | | | | | | | | | | | |

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| **FOURTH QUARTER** | | | | | | | | | | | | | |
| **Unit 9: Probability** | | | | | | | | | | | | | |
| **Learning Goals** | **A210:** Understand independence and conditional probability and use the rules of probability to compute and interpret data in a probability model. | | | | | | | | | | | **# Days** | **12** |
| **Standards** | **FL Coding** | | **Standards** | | | | | | | | | | |
| S-CP.1.1  S-CP.1.2  S-CP.1.3  S-CP.1.4    S-CP.1.5 S-CP.2.6 S-CP.2.7 | | Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or”, “and”, “not”).  Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.  Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.  Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent of one another and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.  Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.  Find the conditional probability of A given B as the fraction of B’s outcomes that also belong to A, and interpret the answer in terms of the model.  Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model. | | | | | | | | | | |
| **Mathematical Practices** | | | | | | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | | 2. Reason abstractly and quantitatively. | | 3. Construct viable arguments and critique the reasoning of others. | | 4. Model with mathematics. | 5. Use appropriate tools strategically. | 6. Attend to precision. | | 7. Look for and make use of structure. | 8. Look for and express regularity in repeated reasoning. | | |
| **Suggested Days** | **Lesson Objective (Instructional Resources)** | | | | **Suggested Assignments/Assessments**  **(Pages are for student edition).** | | | | **Supplementary Materials** | | | | |
| **For Unit 9, student text can be found here:** <http://www.cpm.org/pdfs/standards/CCSS/CCSS%20GC%20student%20V1.1.pdf>  **For Unit 9, teacher text can be found here:** <http://www.cpm.org/pdfs/standards/CCSS/CCSS%20GC%20teacher%20V1.1.pdf>   * **For additional resources, see Blackboard,** [**SCPS High School Math Teachers**](https://bb.scps.k12.fl.us/webapps/portal/frameset.jsp?tab_tab_group_id=_2_1&url=%2Fwebapps%2Fblackboard%2Fexecute%2Flauncher%3Ftype%3DCourse%26id%3D_948_1%26url%3D)**, 2013-2014 Resources, Algebra 2, Statistics Resources** | | | | | | | | | | | | | |
| 2 | Probability Models | | | | Pg. 27-33  #9-1 through 9-8 | | | | <http://www.stat.yale.edu/Courses/1997-98/101/probint.htm> | | | | |
| 1 | Unions and Intersections | | | | Pg. 34-37  #9-14 through 9-18 | | | | <http://2012books.lardbucket.org/books/introductory-statistics/section_07_02.html> | | | | |
| 1 | Complements | | | | Pg. 38-42  #9-23 through 9-27 | | | | <http://2012books.lardbucket.org/books/introductory-statistics/section_07_02.html> | | | | |
| 2 | Conditional Probability | | | | Pg. 43-46  #9-45 through 9-48 | | | | <http://www.shodor.org/interactivate/standards/organization/360/> | | | | |
| 1 | Two-Way Tables | | | | Pg. 47-50  #9-54 through 9-58 | | | | <http://people.richland.edu/james/lecture/m170/ch05-rul.html#gmr> | | | | |
| 1 | Independence | | | | Pg. 51-55  #9-63 through 9-66 | | | |  | | | | |
| 1 | Applications of Independence | | | | Pg. 56-58  #9-71 through 9-76 | | | |  | | | | |
| 1 | Base Rate Fallacy | | | | Pg. 59-61  #9-80 | | | |  | | | | |
| 2 | Review/Assessment. | | | |  | | | |  | | | | |

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| **FOURTH QUARTER** | | | | | | | | | | | | | | |
| **Unit 10: The design of statistical studies.** | | | | | | | | | | | | | | |
| **Learning Goals** | **A213:** Use surveys, experiments and observational studies to collect data. | | | | | | | | | | | **# Days** | | **10** |
| **Standards** | **FL Coding** | | **Standards** | | | | | | | | | | | |
| S-IC.1.1  S-IC.2.3  S-IC.2.6 | | Understand statistics as a process for making inferences about population parameters based on a random sample from that population.  Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.  Evaluate reports based on data. | | | | | | | | | | | |
| **Mathematical Practices** | | | | | | | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | | 2. Reason abstractly and quantitatively. | | 3. Construct viable arguments and critique the reasoning of others. | | | 4. Model with mathematics. | 5. Use appropriate tools strategically. | 6. Attend to precision. | 7. Look for and make use of structure. | | | 8. Look for and express regularity in repeated reasoning. | |
| **Suggested Days** | **Lesson Objective (Instructional Resources)** | | | | | **Suggested Assignments/Assessments**  **(Pages are for student edition).** | | | | | **Supplementary Materials** | | | |
| **For Units 10 and 11, student text can be found here:** <http://www.cpm.org/pdfs/standards/CCSS/CCSS%20A2C%20student%20V1.1.pdf>  **For Units 10 and 11, teacher text can be found here:** <http://www.cpm.org/pdfs/standards/CCSS/CCSS%20A2C%20teacher%20V1.1.pdf>  **For additional resources, see Blackboard,** [**SCPS High School Math Teachers**](https://bb.scps.k12.fl.us/webapps/portal/frameset.jsp?tab_tab_group_id=_2_1&url=%2Fwebapps%2Fblackboard%2Fexecute%2Flauncher%3Ftype%3DCourse%26id%3D_948_1%26url%3D)**, 2013-2014 Resources, Algebra 2, Statistics Resources** | | | | | | | | | | | | | | |
| 1 | Population parameters and sample statistics | | | | Pg. 50-52  #6-1 through 6-2 | | | | | |  | | | |
| 1 | Detecting Bias in Survey Questions | | | | Pg. 53-56  #6-6 through 6-12 | | | | | |  | | | |
| 1 | Representative Random Samples | | | | Pg. 57-59  #6-15 through 6-18 | | | | | |  | | | |
| 1 | Cluster Samples | | | | Pg. 60-62  #6-20 through 6-27 | | | | | |  | | | |
| 1 | Sample-to Sample Variability | | | | Pg. 63-65  #6-30 through 6-37 | | | | | |  | | | |
| 1 | Experiments, Cause, and Effect | | | | Pg. 69-71  #6-48 through 6-52 | | | | | |  | | | |
| 1 | Putting it together | | | | Pg. 72-73  #6-56 | | | | | |  | | | |
| 3 | Review/Assessment | | | |  | | | | | |  | | | |

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| **FOURTH QUARTER** | | | | | | | | | | | | | | |
| **Unit 11: Gathering data, making inferences, and justifying conclusions.** | | | | | | | | | | | | | | |
| **Learning Goals** | **A214:**  Make inferences and justify statistical conclusions about data. | | | | | | | | | | | **# Days** | | **14 (10)** |
| **Standards** | **FL Coding** | | | **Standards** | | | | | | | | | | |
| S-IC.2.6  S-ID.1.4  S-IC.2.4  S-IC.2.5  S-IC.1.2 | | | Evaluate reports based on data.  Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.  Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.  Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.  Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coil falls heads us with probability 0.5. Would a result of 5 tails in a row cause you to question the model? | | | | | | | | | | |
| **Mathematical Practices** | | | | | | | | | | | | | | |
| 1. Make sense of problems and persevere in solving them. | | | 2. Reason abstractly and quantitatively | | 3. Construct viable arguments and critique the reasoning of others. | 4. Model with mathematics. | 5. Use appropriate tools strategically. | 6. Attend to precision. | | 7. Look for and make use of structure. | 8. Look for and express regularity in repeated reasoning. | | | |
| **Suggested Days** | | **Lesson Objective (Instructional Resources)** | | | | | | | **Suggested Assignments/Assessments**  **(Pages are for student edition).** | | | | **Supplementary Materials** | |
| **For Units 10 and 11, student text can be found here:** <http://www.cpm.org/pdfs/standards/CCSS/CCSS%20A2C%20student%20V1.1.pdf>  **For Units 10 and 11, teacher text can be found here:** <http://www.cpm.org/pdfs/standards/CCSS/CCSS%20A2C%20teacher%20V1.1.pdf>  **For additional resources, see Blackboard,** [**SCPS High School Math Teachers**](https://bb.scps.k12.fl.us/webapps/portal/frameset.jsp?tab_tab_group_id=_2_1&url=%2Fwebapps%2Fblackboard%2Fexecute%2Flauncher%3Ftype%3DCourse%26id%3D_948_1%26url%3D)**, 2013-2014 Resources, Algebra 2, Statistics Resources** | | | | | | | | | | | | | | |
| 1 | Comparing Distributions | | | | | | | | Pg. 35-37  #5-59 through 5-63 | | | |  | |
| 1 | Normal Density Functions | | | | | | | | Pg. 38-45  #5-70 through 5-75 | | | |  | |
| 1 | Percentiles | | | | | | | | Pg. 46-49  #5-79 through 5-83 | | | |  | |
| 1 | Residuals <http://www.cpm.org/pdfs/standards/CCSS/CCSS%20AC%20student%20V1.1.pdf> <http://www.cpm.org/pdfs/standards/CCSS/CCSS%20AC%20teacher%20V1.1.pdf> | | | | | | | | Pg. 124 – 129  #7-7 and 7-8 | | | |  | |
| 1 | Simulations of Probability | | | | | | | | Pg. 74-76  #8-1 through 8-2 | | | |  | |
| 1 | More Simulations of Probability | | | | | | | | Pg. 77-79  #8-5 through 8-7 | | | |  | |
| 1 | Simulating Sampling Variability | | | | | | | | Pg. 80-82  #8-11 | | | |  | |
| 1 | Sampling Variability with Increased Sample Size | | | | | | | | Pg. 83-85  #8-14 through 8-15 | | | |  | |
| 1 | Statistical Test Using Sampling Variability | | | | | | | | Pg. 86-89  #8-19 through 8-20 | | | |  | |
| 1 | Variability in Experimental Results | | | | | | | | Pg. 90-94  #8-23 | | | |  | |
| 1 | Quality Control | | | | | | | | Pg. 95-96  #8-26 through 8-28 | | | |  | |
| 3 | Review/Assessment | | | | | | | |  | | | |  | |
|  | **FSA Tests (**7 days) | | | | | | | | | | | | | |
|  | **Nine Week Review/Exam** (3 days) | | | | | | | | | | | | | |