**8th Grade Pre-Algebra**

**Instructional Plan 2014-2015**

**Mathematics Instructional Plan Writing Committee**

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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 Math Florida Standards (MAFS) while using the Springboard Course 3 Textbook. 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.
* Extended time has been allocated for authentic assessment tasks. Recommendations are made within the instructional plan to include summative assessments and review, authentic assessments, as well as culminating tasks (Amplify projects). District training will be provided on successful implementation of the Amplify projects throughout the year.
* 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 and diagnostics 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.

**2. (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** |
| --- | --- |
| **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?
 |
| **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** | **Approximate # of Days** |
| Unit 1 – Integer Exponents and Scientific Notation |  | 15 |
| Unit 2 – Expressions and Equations |  | 23 |
| District Assessment (2 days), 9 Weeks Exams (2 days) |  | 4 |
|  |
| **SECOND QUARTER (October 13 – December 18)**  | **46 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Approximate # of Days** |
| Unit 2 – Expressions and Equations (cont.) |  | 5 |
| Unit 3 – Functions  |  | 16 |
| Unit 4 – Statistics |  | 11 |
| Unit 5 – Angle Relationships |  | 6 |
| Unit 6 – Solving Linear and Simultaneous Linear Equations |  | 3 |
| District Assessment (2 days); 9 Weeks Exams (3 days) |  | 5 |
|  |
| **THIRD QUARTER (January 6 – March 12)** | **46 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Approximate # of Days** |
| Unit 6 – Solving Linear and Simultaneous Linear Equations (cont.) |  | 20 |
| Unit 7 – Volume of Cones, Cylinders, and Spheres |  | 9 |
| Unit 8 – Transformational Geometry |  | 7 |
| Unit 9 – The Pythagorean Theorem and Irrational Numbers |  | 4 |
| District Assessment (2 days); FSA ELA/Writing (1 day); 9 Weeks Exams (3 days) |  | 6 |
|   |
| **FOURTH QUARTER (March 23 – May 27)**  | **46 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Approximate # of Days** |
| Unit 9 – The Pythagorean Theorem and Irrational Numbers (cont.) |  | 12 |
| Unit 10 – Solving and Graphing Equations & Inequalities Extensions |  | 19 |
| State Test Review (3 days); FSA Tests (7 days); Cumulative Review (2 days); 9 Weeks Exams (3 days) |  | 15 |

*\*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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| **Unit 1: Integer Exponents and Scientific Notation** |
| **Code** | **Mathematics Florida Standard** | **SMP** |
| 8.EE.1.1 | Know and apply the properties of integer exponents to generate equivalent numerical expressions. | 2,5,6,7 |
| 8.EE.1.2 | Use square root and cube root symbols to represent solutions to equations of the form x2=p and x3 =p, where p is a positive rational number. | 2 |
| 8.EE.1.3 | Use numbers expressed in the form of a single digit times and integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. | 4 |
| 8.EE.1.4 | Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology. | 6,7,8 |
| **Learning Goal and Scale** | **Additional Notes** |
| [**802:** Work with radicals and integer exponents.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/802.docx)[**803:** Apply integer exponents to perform operations involving scientific notation.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/803.docx) | * Students may confuse exponent rules.
* Students may mistakenly think the exponent indicates the number of zeroes in the number**.**
 |
| **Math Practices for Unit** | **Unit Connections** | **Instructional Resources** |
| 1. Make sense of problems and persevere in solving them. | 5. Use appropriate tools strategically. | **Previous Knowledge Should Include:*** sets and subsets of rational numbers
* operations with rational numbers
* exponents
* place value

**Intensive Math Connection:**Growing, Growing, Growing | Scientific Calculators |  |
| 2. Reason abstractly and quantitatively. | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | 7. Look for and make use of structure. |
| 4. Model with mathematics. | 8. Look for and express regularity in repeated reasoning. |

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| **FIRST QUARTER** |
| **Unit 1: Integer Exponents and Scientific Notation** |
| **Learning Goal** | [**802:** Work with radicals and integer exponents.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/802.docx)[**803:** Apply integer exponents to perform operations involving scientific notation.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/803.docx) | **Suggested # of Days** | **15** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Questions/Assessments** | **Ancillary Materials** |
| 3 |  | Prerequisite Skills Check/Procedures/Goals & Scales |  |  |
| 4 | 8.EE.1.18.EE.1.2 | 1.2 Properties of ExponentsEmbedded AssessmentAdditional practice | pages 13-18pages 19-20page 50 #’s 5-13 |  |
| 4 | 8.EE.1.38.EE.1.4 | 1.3 Scientific NotationAdditional Practice(3 days to complete ancillary materials)*\*\*ancillary materials MUST be used to meet required standards as the text does not fully address applications of scientific notation* | pages 28-30 page 50 #’s 21-23 | **EngageNY Grade 8 Module 1** Topic B: Lessons 10 –[TV](https://content.engageny.org/file/46351/download/math-g8-m1-topic-b-lesson-10-teacher.pdf?token=sgjfXhegjA2tM3ixajI7dSkRA_Rtl150joViIUtw5H4) and [SV](https://content.engageny.org/file/46346/download/math-g8-m1-topic-b-lesson-10-student.pdf?token=xim28n7ovuhIJgC1IVDMBeaOwxJW9Vdmndn55e6cCQ8)Topic B: Lessons 11 –[TV](https://content.engageny.org/file/46376/download/math-g8-m1-topic-b-lesson-11-teacher.pdf?token=o5qn0uX9aLXgj5HpgkwGCg6WgpkjonnkfHu7hVg1S6Y) and [SV](https://content.engageny.org/file/46371/download/math-g8-m1-topic-b-lesson-11-student.pdf?token=-WER4t_VSO5jjAl0lWnRE3ZaGNN2paZuYxDwCtfgJdk)Topic B: Lessons 12 –[TV](https://content.engageny.org/file/46401/download/math-g8-m1-topic-b-lesson-12-teacher.pdf?token=2FTcF5ulu0Vnltzp8IzMNGV4zjUzQ-l_aLYbxdkirAs) and [SV](https://content.engageny.org/file/46396/download/math-g8-m1-topic-b-lesson-12-student.pdf?token=hRcthXW_hfBeq7kY7nwt-JM6CzXOvHnP1s09lDv7LrM) |
| 1 | 8.EE.1.18.EE.1.2 | Integer Exponents |  | **(Blackboard Resource)**[Ponzi Scheme](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/ponzi_pyramid_schemes.pdf) (+[rubric](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/ponzi_schemes_rubric.pdf)) |
| 2 | 8.EE.1.3 8.EE1.4 | Applications With Scientific Notation |  | **(Blackboard Resources)**[Scientific Notation With Percent](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scientific_notation_with_percents.pdf) (+[rubric](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scientific_notation_with_percents_rubric.pdf))[Applications With Scientific Notation](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/applications_using_scientific_notation_with_key.pdf) |
| 1 |  | Review/Assessment |  | **(Optional Assessment on Blackboard)**[Operations with Scientific Notation](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/operationswithscientificnotation_quiz_inc._answers.pdf) |

**\*TV = “Teacher Version”**

**\*SV = “Student Version”**

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| **Unit 2: Expressions and Equations** |
| **Code** | **Mathematics Florida Standard** | **SMP** |
| 8.EE.2.5 | Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. | 1,5,7 |
| 8.EE.2.6 | Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation *y=mx* for a line through the origin and the equation *y=mx + b* for a line intersecting the vertical axis at *b*. | 2,7 |
| 8.EE.3.7 | Solve linear equations in one variable.1. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form *x* = *a*, *a* = *a*, or *a* = *b* results (where *a* and *b* are different numbers).
2. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
 | 3,6,7 |
| **Learning Goal and Scale** | **Instructional Strategies & Misconceptions** |
| [**804:** Understand the connections between proportional relationships, lines, and linear equations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/804.docx)[**805:** Solve linear equations with rational coefficients where there is one solution, infinitely many solutions, and no solution.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/805.docx)  | * Experiences should move through the stages of concrete, conceptual, and algebraic/abstract.
* Pairing contextual situations with equation solving allows students to connect mathematical analysis with real-life events. Students should experience analyzing and representing contextual situations with equations.
 |
| **Math Practices for Unit** | **Unit Connections** | **Instructional Resources** |
| 1. Make sense of problems and persevere in solving them. | 5. Use appropriate tools strategically. | **Previous Knowledge Should Include:*** rates and proportionality
* a basic understanding oflinear relationships represented by tables, graphs, or equations
* a basic understanding of constant rates of change represented by tables, descriptions, equations, or graphs

**Intensive Math Connection:**Moving Straight Ahead | Algebra TilesCountersBeansBLM 21 and 22 |  |
| 2. Reason abstractly and quantitatively. | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | 7. Look for and make use of structure. |
| 4. Model with mathematics. | 8. Look for and express regularity in repeated reasoning. |

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| **FIRST/SECOND QUARTER** |
| **Unit 2: Expressions and Equations** |
| **Learning Goal** | [**804:** Understand the connections between proportional relationships, lines, and linear equations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/804.docx)[**805:** Solve linear equations with rational coefficients where there is one solution, infinitely many solutions, and no solution.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/805.docx) | **Suggested # of Days** | **Q1: 23** **(4)****Q2: 5** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested****Questions/Assessments** | **Ancillary Materials** |
| 4 | 8.EE.2.5 | 2.1 Writing Expressions for PatternsAdditional Practice | pages 57-66page 109 #’s 1-4 |  |
| 6 | 8.EE.2.58.EE.3.7 | 2.2 Solving EquationsAdditional Practice | pages 67-78p110 #’s 5-16 |  |
| 3 | 3.1 Linear and Non-Linear PatternsAdditional Practice | pages 117-124p177 #’s 1-7 |  |
| 5 | 3.3 Exploring SlopeAdditional Practice | p137 #’s 137-144p178 #’s 16-20 |  |
| 5 | 8.EE.2.58.EE.2.68.EE.3.7 | 3.4 Slope-Intercept Form(1 day to complete ancillary materials)*\*\*ancillary materials MUST be used to meet required standards regarding explaining slope using similar triangles* | pages 145-152page 179 #’s 21-30 | **EngageNY Grade 8 - Module 4**Topic C: Lesson 16 – [TV](https://content.engageny.org/file/47596/download/math-g8-m4-topic-c-lesson-16-teacher.pdf?token=YPGlbF3DPXOxvKCf95bbISoqSS5c2bPbYsOc1K83CmA) and [SV](https://content.engageny.org/file/47591/download/math-g8-m4-topic-c-lesson-16-student.pdf?token=2cIr_hCHcOgCqDJK2KDgLRv5-o9_mff_iQF4dMYRE6M) |
| 4 |  | District Assessment(2 days) 9 week exams (2 days) |  |  |
| **END 1ST QUARTER** |
| 3 | 8.EE.2.48.EE.2.58.EE.3.7 | Lines and Linear Equations |  | **(Blackboard Resource)**[Lines and Linear Equations](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/lines_and_linear_equations_activity.pdf) |
| 2 |  | Review/Assessment |  |  |

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| **Unit 3: Functions** |
| **Code** | **Mathematics Florida Standard** | **SMP** |
| 8.F.1.1 | Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. | 2,5 |
| 8.F.1.2 | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).  | 2,5 |
| 8.F.1.3 | Interpret the equation *y = mx + b* as defining a linear function, whose graph is a straight line; give examples of functions that are not linear | 2,7 |
| 8.F.2.4 | Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (*x, y*) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. | 2,4 |
| 8.F.2.5 | Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally | 2,5,7 |
| **Learning Goal and Scale** | **Instructional Strategies & Misconceptions** |
| [**807:** Define, evaluate, and compare functions.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/807.docx)[**808:** Use functions to model relationships between quantities.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/808.docx) | * Some students will mistakenly think of a straight line as horizontal or vertical only.
* Some students will mix up *x*- and *y*-axes on the coordinate plane, or mix up the ordered pairs.
* Students may think that plotting the *x*-value followed by the *y-*value is mandatory, rather than learning that this is merely a convention. Points can be plotted either way, but it is useful to agree on a standard practice so most may have learned it this way.
* Students often confuse a recursive rule with an explicit formula for a function. (i.e. an increase of 2 in the output values for every change of 1 in the input written as y = x + 2 instead of y = 2x + b)
* When input values are not increasing consecutive integers, some students have more difficulty identifying the pattern and calculating the slope.
* Some students may not pay attention to the scale on a graph, assuming the scale units are always one.
 |
| **Math Practices for Unit** | **Unit Connections** | **Instructional Resources** |
| 1. Make sense of problems and persevere in solving them. | 5. Use appropriate tools strategically. | **Previous Knowledge Should Include:*** rates and proportionality
* a basic understanding oflinear relationships represented by tables, graphs, or equations
* a basic understanding of constant rates of change represented by tables, descriptions, equations, or graphs

**Intensive Math Connection:**Moving Straight Ahead | Graph paperruler |  |
| 2. Reason abstractly and quantitatively. | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | 7. Look for and make use of structure. |
| 4. Model with mathematics. | 8. Look for and express regularity in repeated reasoning. |

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| **SECOND QUARTER** |
| **Unit 3: Functions** |
| **Learning Goal** | [**807:** Define, evaluate, and compare functions.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/807.docx)[**808:** Use functions to model relationships between quantities.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/808.docx) | **Suggested # of Days** | **16** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested****Questions/Assessments** | **Ancillary Materials** |
| 7 | 8.F.1.18.F.1.28.F.1.38.F.2.48.F.2.5 | 3.2 FunctionsAdditional PracticeEmbedded Assessment | pages 125-134page 177-178 #’s 8-15pages 135-136 | **EngageNY: Grade 8 - Module 5**Topic A: Lesson 4 – [TV](https://content.engageny.org/file/48286/download/math-g8-m5-topic-a-lesson-4-teacher.pdf?token=o_E3ddrTd_-4YwlRHdrkDG7Lo_CKiqYoCCLtoBV2kYQ) and [SV](https://content.engageny.org/file/48281/download/math-g8-m5-topic-a-lesson-4-student.pdf?token=nafhXviRPkiy-2BiXn12BEDawpGKPWeKCX1Uv9w_s2U) |
| 3 | 8.F.2.48.F.2.5 | Average Rate of Change |  | **EngageNY: Grade 8 - Module 7**Topic D: Lesson 22 – [TV](https://content.engageny.org/file/49926/download/math-g8-m7-topic-d-lesson-22-teacher.pdf?token=4KEfnxtI-yoLKZX9HjuVDlIUmIzZQLIhA-zOqM9cgVs) and [SV](https://content.engageny.org/file/49921/download/math-g8-m7-topic-d-lesson-22-student.pdf?token=1OF8hQ4ngVXalzXJtipQaE_5amARH-nZ_Uzp2NI2MMc) |
| 1 | 8.F.2.5 | Graphs of Linear Functions |  | **EngageNY: Algebra - Module 1**Topic A: Lesson 1 – [TV](https://content.engageny.org/file/50056/download/algebra-i-m1-topic-a-lesson-1-teacher.pdf?token=89NUFBMyZACpvWKLbQx8ymNGx1Q62xwkVXTbQkzlTgg) and [SV](https://content.engageny.org/file/50041/download/algebra-i-m1-topic-a-lesson-1-student.pdf?token=XkyVqC_bj-jF2p_xNRLWLuDNIsiHbe6P7WITYYCoFd8) |
| 5 |  | Assessment/ReviewAND/OR Amplify Project – Stadium Seating |  | **Resources found on Amplify website** |

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| **Unit 4: Statistics** |  |  |
| **Code** | **Mathematics Florida Standard** | **SMP** |
| 8.SP.1.1 | Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. | 3,5,7 |
| 8.SP.1.2 | Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. | 2,5,7 |
| 8.SP.1.3 | Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept | 2,4,6,7 |
| 8.SP.1.4 | Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables | 2,4,5,7 |
| **Learning Goal and Scale** | **Instructional Strategies & Misconceptions** |
| [**814:** Investigate patterns of association in bivariate data**.**](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/814.docx) | * Students may believe bivariate data is only displayed in scatter plots.
* Students may mistakenly think their lines of best fit for the same set of data will be exactly the same. Because students are informally drawing lines of best fit, the lines will vary slightly. To obtain the exact line of best fit, students would use technology to find the line of regression.
 |
| **Math Practices for Unit** | **Unit Connections** | **Instructional Resources** |
| 1. Make sense of problems and persevere in solving them. | 5. Use appropriate tools strategically. | **Previous Knowledge Should Include:*** how to interpret data
* find the mean of a data set
* solve problems using graphs of data

**There is no connection to Intensive Math** | WeightRubber bandsMeter sticksGraph paper |  |
| 2. Reason abstractly and quantitatively. | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | 7. Look for and make use of structure. |
| 4. Model with mathematics. | 8. Look for and express regularity in repeated reasoning. |

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| **SECOND QUARTER** |
| **Unit 4: Statistics** |
| **Learning Goal** | [**814:** Investigate patterns of association in bivariate data**.**](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/814.docx) | **Suggested # of Days** | **11** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Questions/Assessments** | **Ancillary Materials** |
| 6 | 8.SP.1.18.SP.1.28.SP.1.38.SP.1.4 | 3.6 Analyze Bivariate DataAdditional Practice | p163-168p180 #’s 43-47 | **EngageNY Grade 8 - Module 6**Topic B: Lesson 8 – [TV](https://content.engageny.org/file/48781/download/math-g8-m6-topic-b-lesson-8-teacher.pdf?token=ESkZ61yK-fko46-0FAitpG0RzDvhPFVM3xrWsFqZWcE) and [SV](https://content.engageny.org/file/48776/download/math-g8-m6-topic-b-lesson-8-student.pdf?token=TS3x6dY6e1WLJUeRvMmP0AOj35KZmOBUtBFtLOgmIyE)**EngageNY Grade 8 - Module 6**Topic D: Lesson 14 – [TV](https://content.engageny.org/file/49011/download/math-g8-m6-topic-d-lesson-14-teacher.pdf?token=yN6Aah2CxSUDZZhzOX8rYff9HuAsXw0z1sNahjLPrf0) and [SV](https://content.engageny.org/file/49001/download/math-g8-m6-topic-d-lesson-14-student.pdf?token=jpSLWhawn8mw1dY05-82HbwJ0_WtFl5guPrCUos1gFE) |
| 5 |  | Assessment/ReviewAND/OR Amplify Project – Bringing Statues to Life |  | **Resources found on Amplify website** |

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| **Unit 5: Angle Relationships** |
| **Code** | **Mathematics Florida Standard** | **SMP** |
| 8.G.1.5 | Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. | 3,5,6 |
| **Learning Goal and Scale** | **Instructional Strategies & Misconceptions** |
| [**811:** Use informal arguments to establish facts about angle relationships with parallel lines, triangles, and polygons.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/811.docx) | * Students may be tempted to assume some angles are congruent in a figure just by looking at the figure.
* Students may be tempted to assume some angles are right angles just by looking at the figure.
 |
| **Math Practices for Unit** | **Unit Connections** | **Instructional Resources** |
| 1. Make sense of problems and persevere in solving them. | 5. Use appropriate tools strategically. | **Previous Knowledge Should Include:*** Angle pair relationships not related to parallel lines

**Intensive Math Connection**Shapes and Designs |  |  |
| 2. Reason abstractly and quantitatively. | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | 7. Look for and make use of structure. |
| 4. Model with mathematics. | 8. Look for and express regularity in repeated reasoning. |

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| **SECOND QUARTER** |
| **Unit 5: Angle Relationships** |
| **Learning Goal** | [**811:** Use informal arguments to establish facts about angle relationships with parallel lines, triangles, and polygons.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/811.docx) | **Suggested # of Days** | **6**  |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested****Questions/Assessments** | **Ancillary Materials** |
| 5 | 8.G.1.5 | 4.1 Angle-Pair RelationshipsAdditional Practice*\*\*ancillary materials MUST be used to meet required standards regarding applications within parallel lines cut by a transversal, informal proofs of angle sum theorem, and exterior angles* | pages 187-194page 243 #’s 1-7 | **EngageNY Grade 8 - Module 2** Topic C: Lesson 12 - [TV](https://content.engageny.org/file/46741/download/math-g8-m2-topic-c-lesson-12-teacher.pdf?token=j65d0HEHQNsavZVEp6RSrOnY2CQV2R5XR60rSThhbJU) and [SV](https://content.engageny.org/file/46736/download/math-g8-m2-topic-c-lesson-12-student.pdf?token=2ZMliPQNkpm-klfMHhYaIGmK3GS8VFZkbhfd0VbIQNc)Topic C: Lesson 13 - [TV](https://content.engageny.org/file/46766/download/math-g8-m2-topic-c-lesson-13-teacher.pdf?token=wslXs3LWE_XYDwkD9ZufDmRZCF95PR8u_FtQiHOcRts) and [SV](https://content.engageny.org/file/46761/download/math-g8-m2-topic-c-lesson-13-student.pdf?token=5lOKncLAOoUiXLacuL7W-7E8SvlzO1Il-Uc0QH2cSsc)Topic C: Lesson 14 - [TV](https://content.engageny.org/file/46791/download/math-g8-m2-topic-c-lesson-14-teacher.pdf?token=usZnEdknTUDo_v-P9JXKC_gQX-tOgTLhpNAWr3aNg1I) and [SV](https://content.engageny.org/file/46786/download/math-g8-m2-topic-c-lesson-14-student.pdf?token=hYJ2v1pOdaGfpFexGqUf8W2crAKzTau2xjDnI89q83Q) |
| 1 |  | Review/Assessment |  |  |

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| **Unit 6: Solving Linear and Simultaneous Linear Equations** |
| **Code** | **Mathematics Florida Standard** | **SMP** |
| 8.EE.3.7 | Solve linear equations in one variable.1. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form *x* = *a*, *a* = *a*, or *a* = *b* results (where *a* and *b* are different numbers).
2. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
 | 3,6,7 |
| 8.EE.3.8 | Analyze and solve pairs of simultaneous linear equations. 1. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
2. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.
3. Solve real-world and mathematical problems leading to two linear equations in two variables.
 | 1,2,3,5,6,7 |
| **Learning Goal and Scale** | **Instructional Strategies & Misconceptions** |
| [**805:** Solve linear equations with rational coefficients where there is one solution, infinitely many solutions, and no solution.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/805.docx)  [**806:** Analyze and solve pairs of simultaneous linear equations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/806.docx) | * Students may think that only the letters *x* and *y* can be used for variables in linear equations.
* Students may think that you always need a variable equal to a constant as a solution.
* Students may think the variable always needs to be on the left side of the equation.
* Equations are not always in slope-intercept form, and students may struggle to recognize what to do in this situation.
* Students confuse one-variable and two-variable equations.
 |
| **Math Practices for Unit** | **Unit Connections** | **Instructional Resources** |
| 1. Make sense of problems and persevere in solving them. | 5. Use appropriate tools strategically. | **Previous Knowledge Should Include:**Solve multi-step linear equations**Intensive Math Connection**Thinking With Mathematical Models, and Shapes of Algebra | Graph paperSmall cupsCentimeter cubes |  |
| 2. Reason abstractly and quantitatively. | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | 7. Look for and make use of structure. |
| 4. Model with mathematics. | 8. Look for and express regularity in repeated reasoning. |

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| **SECOND/THIRD QUARTER** |
| **Unit 6: Solving Linear and Simultaneous Linear Equations** |
| **Learning Goal** | [**805:** Solve linear equations with rational coefficients where there is one solution, infinitely many solutions, and no solution.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/805.docx)  [**806:** Analyze and solve pairs of simultaneous linear equations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/806.docx) | **Suggested # of Days** | **Q2: 3** **(5)****Q3: 20** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested****Questions/Assessments** | **Ancillary Materials** |
| 3 | 8.EE.3.7 | 2.4 Modeling and Solving Multi-Step EquationsAdditional Practice | pages 91-98p111 #’s 21-28 |  |
| 5 |  | District Assessment (2 days) 9 week exams (3 days) |  |  |
| **END 2nd QUARTER** |
| 4 | 8.EE.3.7 | 2.4 Modeling and Solving Multi-Step Equations (cont.)Additional Practice*\*\*ancillary materials MUST be used to meet required standards* | pages 91-98p111 #’s 21-28 | **EngageNY Grade 8 - Module 4** Topic A: Lesson 6 – [TV](https://content.engageny.org/file/47346/download/math-g8-m4-topic-a-lesson-6-teacher.pdf?token=wh9x7xEipOPxJrPdx4cSI94UpcT0BmhXVq-5ru8Z-P8) and [SV](https://content.engageny.org/file/47341/download/math-g8-m4-topic-a-lesson-6-student.pdf?token=SF0WanhtxN42hahBP-Gnqm6zNrTNkfPmYij45IFWnk4)Topic A: Lesson 7 – [TV](https://content.engageny.org/file/47371/download/math-g8-m4-topic-a-lesson-7-teacher.pdf?token=NRY69UVtgFXrXkQB23MTAaizTMRXVxo57upnSYp3MMk) and [SV](https://content.engageny.org/file/47366/download/math-g8-m4-topic-a-lesson-7-student.pdf?token=3ZvDm1MEjuEnuO2DkUgHY9cCnnme3Vvgjrn91bZy64I)Topic A: Lesson 8 *–* [*TV*](https://content.engageny.org/file/47396/download/math-g8-m4-topic-a-lesson-8-teacher.pdf?token=0rrkMa9qKNW9Lacd-dLdY_pTU5ixPkMUep2oeKnLOPw) *and* [*SV*](https://content.engageny.org/file/47391/download/math-g8-m4-topic-a-lesson-8-student.pdf?token=eGyvL7-HykDC4IpLDnISw9wX_PYYoKEAfJr00Q7PO3M) *(optional enrichment)* |
| 3 | 8.EE.3.7 | 3.5 Intercepts, Horizontal and Vertical Lines Additional Practice | pages 153-160pages 179-180 3’S 31-42 |  |
| 4 | 8.EE.3.8 | 3.7 Systems of Linear Equations | pages 169-174page 181 #’s48-55 |  |
| 4 | 8.EE.3.8 | 3.7 Systems of Linear Equations (cont.)Additional Practice*\*\*ancillary materials MUST be used to meet required standards regarding solving systems of equations algebraically* | pages 169-174page 181 #’s48-55 | **EngageNY Grade 8 - Module 4**Topic D: Lessons 27 – [TV](https://content.engageny.org/file/47981/download/math-g8-m4-topic-d-lesson-27-teacher.pdf?token=TjUxySpfX8KljdxiU4CkJ-qnZiowZzUk-8gLvpzZocg) and [SV](https://content.engageny.org/file/47976/download/math-g8-m4-topic-d-lesson-27-student.pdf?token=7hDfaKP0g7TXr5bVGHEfQwKdC8CPAz9cmY9DPqSW2aQ)Topic D: Lessons 28 – [TV](https://content.engageny.org/file/48006/download/math-g8-m4-topic-d-lesson-28-teacher.pdf?token=Y-JVBtn8MgYWbWdKPY_VatE_F_zPT50QaiCl2a6qWLc) and [SV](https://content.engageny.org/file/48001/download/math-g8-m4-topic-d-lesson-28-student.pdf?token=gaNviSYWbV1fXH5QDxSX7vOsM9YwZcibv2jEfvmidNc)Topic D: Lessons 29 – [TV](https://content.engageny.org/file/48031/download/math-g8-m4-topic-d-lesson-29-teacher.pdf?token=bmsqNQYOD5W4iFzCe2D8HWqj8dHdS0U_F8LfRtZOqIg) and [SV](https://content.engageny.org/file/48026/download/math-g8-m4-topic-d-lesson-29-student.pdf?token=3oTaWWbmL1IuqZLhvLOXygXw6aViPxT0x6-RF_UrfVg) |
| 5 |  | Review/AssessmentAND/OR Amplify Project: Driving Innovation |  | **Resources found on Amplify website** |

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| **Unit 7: Volume of Cones, Cylinders, and Spheres** |
| **Code** | **Mathematics Florida Standard** | **SMP** |
| 8.G.3.9 | Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems | 1,5 |
| **Learning Goal and Scale** | **Instructional Strategies & Misconceptions** |
| [**813:** Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres**.**](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/813.docx) | * A common misconception among middle grade students is that “volume” is a “number” that results from substituting other numbers into a formula. For these students there is no recognition that “volume” is a measure – related to the amount of space occupied. If a teacher discovers that students do not have an understanding of volume as a measure of space, it is important to provide opportunities for hands on experiences where students “fill” three dimensional objects.
 |
| **Math Practices for Unit** | **Unit Connections** | **Instructional Resources** |
| 1. Make sense of problems and persevere in solving them. | 5. Use appropriate tools strategically. | **Previous Knowledge Should Include:*** Finding the area of a circle
* Finding volume of prisms

**No connection to Intensive Math** | Cone, cylinder and sphere forms (shapes) |  |
| 2. Reason abstractly and quantitatively. | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | 7. Look for and make use of structure. |
| 4. Model with mathematics. | 8. Look for and express regularity in repeated reasoning. |

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| **THIRD QUARTER** |
| **Unit 7: Volume of Cones, Cylinders, and Spheres** |
| **Learning Goal** | [**813:** Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres**.**](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/813.docx) | **Suggested # of Days** | **9** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested****Questions/Assessments** | **Ancillary Materials** |
| 2 | 8.G.3.9 | Volume of Cones and Cylinders |  | **EngageNY Grade 8 - Module 5**Topic B: Lessons 10 – [TV](https://content.engageny.org/file/48446/download/math-g8-m5-topic-b-lesson-10-teacher.pdf?token=_toUARjwnpqw61rbS7OZWrMbM6AepqdnXdj-vN5H4d8) and [SV](https://content.engageny.org/file/48441/download/math-g8-m5-topic-b-lesson-10-student.pdf?token=GwgrZ0lkOz7aSPcTXvlUowIZXujY1zOJyQO5RysTj78) |
| 2 | Volume of a Sphere |  | **EngageNY Grade 8 - Module 5**Topic B: Lessons 11 – [TV](https://content.engageny.org/file/48471/download/math-g8-m5-topic-b-lesson-11-teacher.pdf?token=of4G-q-e1gcGlheAZW0Van0Yh9B6v8ObrRWEYqNJ108) and [SV](https://content.engageny.org/file/48466/download/math-g8-m5-topic-b-lesson-11-student.pdf?token=nSpVrLgdaVvE0mxtmt7Dc1dXeiy5NoU1ilECi1K_2uk) |
| 3 | Estimating Volume |  | **(Blackboard Resource)**[Jellybean Activity](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/jellybean_activity.pdf) |
| 2 | Review/Assessment |  |  |

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| **Unit 8: Transformational Geometry** |
| **Code** | **Mathematics Florida Standard** | **SMP** |
| 8.G.1.1 | Verify experimentally the properties of rotations, reflections, and translations. 1. Lines are taken to lines, and line segments to line segments of the same length.
2. Angles are taken to angles of the same measure.
3. Parallel lines are taken to parallel lines.
 | 3,5,8 |
| 8.G.1.2 | Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. | 2,3,5,7 |
| 8.G.1.3 | Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates | 2,3,5 |
| 8.G.1.4 | Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them | 2,7 |
| **Learning Goal and Scale** | **Instructional Strategies & Misconceptions** |
| [**809:** Understand congruence using physical models, transparencies, or geometry software.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/809.docx)[**810:** Understand similarity using physical models, transparencies, or geometry software.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/810.docx) | * Students often confuse situations that require adding with multiplicative situations in regard to scale factor. Providing experiences with geometric figures and coordinate grids may help students visualize the difference.
 |
| **Math Practices for Unit** | **Unit Connections** | **Instructional Resources** |
| 1. Make sense of problems and persevere in solving them. | 5. Use appropriate tools strategically. | **Previous Knowledge Should Include:*** how to classify and draw plane figures
* how to graph plane figures on the coordinate plane
* congruence and similarity
* scale factor

**Intensive Math Connection**Kaleidoscopes, Hubcaps, and Mirrors | Graph paper |  |
| 2. Reason abstractly and quantitatively. | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | 7. Look for and make use of structure. |
| 4. Model with mathematics. | 8. Look for and express regularity in repeated reasoning. |

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| **THIRD QUARTER** |
| **Unit 8: Transformational Geometry** |
| **Learning Goal** | [**809:** Understand congruence using physical models, transparencies, or geometry software.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/809.docx)[**810:** Understand similarity using physical models, transparencies, or geometry software.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/810.docx) | **Suggested # of Days** | **7** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Questions/Assessments** | **Ancillary Materials** |
| 3 | 8.G.1.18.G.1.28.G.1.38.G.1.4 | 4.2 Angles and TransformationsAdditional Practice | pages 196-199 (stop after #9)page 243-244 #’s 8-10 | **(Blackboard Resources)**[Congruent Figures](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/congruent_figures-student_and_te.doc)[Similar Figures](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/similar_figures_student_and_te.doc) |
| 2 | Representing and Combining Transformations |  | **(Blackboard Resource)**[Representing and Combining Transformations Activity](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/representing_and_combining_transformations_full_lesson_plan.pdf) |
| 2 | Review and Assessment |  |  |

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| **Unit 9: The Pythagorean Theorem and Irrational Numbers** |
| **Code** | **Mathematics Florida Standard** | **SMP** |
| 8.EE.1.1 | Know and apply the properties of integer exponents to generate equivalent numerical expressions. | 7 |
| 8.EE.1.2 | Use square root and cube root symbols to represent solutions to equations of the form x2=p and x3 =p, where p is a positive rational number. | 2,5 |
| 8.NS.1.1 | Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.  | 7,8 |
| 8.NS.1.2 | Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2).  | 5,7,8 |
| 8.G.2.6 | Explain a proof of the Pythagorean Theorem and its converse | 2,6,8 |
| 8.G.2.7 | Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions | 2,3,5 |
| 8.G.2.8 | Apply the Pythagorean Theorem to find the distance between two points in a coordinate system | 2,3,5 |
| **Learning Goal and Scale** | **Instructional Strategies & Misconceptions** |
| [**801:** Use rational approximates to compare and estimate expressions with irrational numbers.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/801.docx)[**802:** Work with radicals and integer exponents.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/802.docx)[**812:** Understand and apply the Pythagorean Theorem.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/812.docx) | * Because so few irrational numbers are named, students sometimes conclude that irrational numbers are unusual and rare. In fact, irrational numbers are much more plentiful than rational numbers.
* Students may mix up the product of powers property and the power of a power property.
* Students may incorrectly assume that the power in scientific notation indicates the number of zeroes in standard form.
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| **Math Practices for Unit** | **Unit Connections** | **Instructional Resources** |
| 1. Make sense of problems and persevere in solving them. | 5. Use appropriate tools strategically. | **Previous Knowledge Should Include:*** Identifying points on a coordinate plane
* Simplify and evaluate expressions
* Find the square of a number

**Intensive Math Connection**Looking for Pythagoras | Scientific calculatorGraph paper |  |
| 2. Reason abstractly and quantitatively. | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | 7. Look for and make use of structure. |
| 4. Model with mathematics. | 8. Look for and express regularity in repeated reasoning. |

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| **THIRD/FOURTH QUARTER** |
| **Unit 9: The Pythagorean Theorem & Irrational Numbers** |
| **Learning Goal** | [**801:** Use rational approximates to compare and estimate expressions with irrational numbers.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/801.docx)[**802:** Work with radicals and integer exponents.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/802.docx)[**812:** Understand and apply the Pythagorean Theorem.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/812.docx) | **Suggested # of Days** | **Q3: 4** **(6)****Q4: 12** **(10)** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Questions/Assessments** | **Ancillary Materials** |
| 2 | 8.EE.1.18.EE.1.28.NS.1.18.NS.1.2 | Square Roots |  | **EngageNY Grade 8 - Module 7**Topic A: Lessons 2 – [TV](https://content.engageny.org/file/49076/download/math-g8-m7-topic-a-lesson-2-teacher.pdf?token=hhZGysoKrxVGFTemOi5kULAcf0NEY7zwRkkFNhabRpA) and [SV](https://content.engageny.org/file/49071/download/math-g8-m7-topic-a-lesson-2-student.pdf?token=Xxa__uN7_EVMRlvtXWsS8MAxzKcl5ldoff9UqtP-D7E)Topic A: Lessons 3 – [TV](https://content.engageny.org/file/49101/download/math-g8-m7-topic-a-lesson-3-teacher.pdf?token=WxOB9jfFlsmveML0fV6s9GYJyV68r0PgQ663m1ktHpk) and [SV](https://content.engageny.org/file/49096/download/math-g8-m7-topic-a-lesson-3-student.pdf?token=d9-ixBJ4oIEye3HMTgeT8GW0uqTV-Bcy5hALo5SO4uE) |
| 2 | 8.NS.1.18.G.2.68.G.2.78.G.2.8 | 6.1 The Pythagorean Theorem | pages 303 -310page 339 #’s 1-12 |  |
| 6 |  | District Assessments (2 days)/ 9 Weeks Exam (3 days)/FSA ELA/Writing (1 day) |
| **End 3rd Quarter** |
| 2 | 8.NS.1.18.G.2.68.G.2.78.G.2.8 | Additional Practice with The Pythagorean Theorem*\*\*ancillary materials MUST be used to meet required standards regarding proofs, the converse of Pythagorean Theorem, and application to the coordinate plane.* |  | **EngageNY Grade 8 - Module 7**Topic C: Lesson 15 – [TV](https://content.engageny.org/file/49586/download/math-g8-m7-topic-c-lesson-15-teacher.pdf?token=xTPHIe_XzPHKKLqsXCYVJadUcri4VhFbFUuEuGIV82A) and [SV](https://content.engageny.org/file/49581/download/math-g8-m7-topic-c-lesson-15-student.pdf?token=4sh5YCIwP3ODrlvVONX8wRgCgSbaNMa9G3M-BbolRtE)Topic C: Lesson 16 – [TV](https://content.engageny.org/file/49616/download/math-g8-m7-topic-c-lesson-16-teacher.pdf?token=98G5rlIED6VN0jRU-1ZMrpmXXnk2EutMy3uNvNE82N8) and [SV](https://content.engageny.org/file/49606/download/math-g8-m7-topic-c-lesson-16-student.pdf?token=8E72CrKRrArE-Y6JQgCeolvdJlkCNPyz4ZyWc8B9ni0)Topic C: Lesson 17 – [TV](https://content.engageny.org/file/49691/download/math-g8-m7-topic-c-lesson-17-teacher.pdf?token=xpR1pu9b_2XaJ4A48cdILwGqP18ltV8LC4zbOfF0-fc) and [SV](https://content.engageny.org/file/49676/download/math-g8-m7-topic-c-lesson-17-student.pdf?token=A4w7qqkdW0nDo-7fYdrhUvtpaB-wtbgI0OycUoFH5Zs)Topic C: Lesson 18 – [TV](https://content.engageny.org/file/49751/download/math-g8-m7-topic-c-lesson-18-teacher.pdf?token=qaCVjnPvmF1s6H-amZFqeLzJMTbRaRHx3CFVM8jr57s) and [SV](https://content.engageny.org/file/49741/download/math-g8-m7-topic-c-lesson-18-student.pdf?token=tsbRRPx_WqzCyEd211JfmA9-cSftRFGj_9MoygWQuPg) |
| 3 | 6.2 Verifying Right TrianglesAdditional PracticeEmbedded Assessment | pages 311-313 (stop after #7)page 339 #’s 13-17pages 315-316 | **EngageNY Grade 8 - Module 7**Topic C: Lesson 18 – [TV](https://content.engageny.org/file/49751/download/math-g8-m7-topic-c-lesson-18-teacher.pdf?token=qaCVjnPvmF1s6H-amZFqeLzJMTbRaRHx3CFVM8jr57s) and [SV](https://content.engageny.org/file/49741/download/math-g8-m7-topic-c-lesson-18-student.pdf?token=tsbRRPx_WqzCyEd211JfmA9-cSftRFGj_9MoygWQuPg) |
| 2 | 8.G.1.28.G.1.48.G.2.7 | Congruence, Similarity, and the Pythagorean Theorem |  | **(Blackboard Resource)**[The Schoolyard Problem](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/the_schoolyard_problem.pdf) |
| 5 |  | Assessment/ReviewAND/OR Amplify Project – The Spiral Staircase |  | **Resources found on Amplify website** |
| 10 days |  | State Test Review (3 days)/FSA Testing (7 days)State Testing Window begins April 13th and closes May 8th. |  |  |

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| **Unit 10: Solving and Graphing Equations & Inequalities Extensions** |
| **Code** | **Mathematics Florida Standard** | **SMP** |
| 7.EE.2.4 | Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. 1. Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.
2. Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.
 | 1,4,7 |
| A-REI.2.3 | Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | 2, 7 |
| **Learning Goal and Scale** | **Instructional Strategies & Misconceptions** |
| [**705:** Solve real-world and mathematical problems using numerical and algebraic expressions and equations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/705.docx)[**A 103:** Solve equations and inequalities in one and two variables, and justify reasoning.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/a103.docx) | * Inequalities need to be taught to this year’s 8th grade students to prevent learning gaps when they enter algebra.
 |
| **Math Practices for Unit** | **Unit Connections** | **Instructional Resources** |
| 1. Make sense of problems and persevere in solving them. | 5. Use appropriate tools strategically. | **Previous Knowledge Should Include:*** Solving multiple step equations in one and two-variables
* Graphing linear equations
* Solving systems of linear equations graphically

**Intensive Math Connection**Shapes of Algebra |  |  |
| 2. Reason abstractly and quantitatively. | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | 7. Look for and make use of structure. |
| 4. Model with mathematics. | 8. Look for and express regularity in repeated reasoning. |

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| **FOURTH QUARTER** |
| **Unit 10: Solving and Graphing Equations & Inequalities Extensions** |
| **Learning Goal** | [**705:** Solve real-world and mathematical problems using numerical and algebraic expressions and equations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/705.docx)[**A 103:** Solve equations and inequalities in one and two variables, and justify reasoning.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/a103.docx) | **Suggested # of Days** | **19****(5)** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested****Questions/Assessments** | **Ancillary Materials** |
| 4 | 7.EE.2.4 | 2.5 Solving and Graphing InequalitiesAdditional Practice | pages 99-106page 111 #’s 29-35 |  |
| 1 | Solving Inequalities |  | **EngageNY Algebra - Module 1**Topic C: Lesson 14 – [TV](https://content.engageny.org/file/50551/download/algebra-i-m1-topic-c-lesson-14-teacher.pdf?token=L5EyVb_Kc16E0H9U93dGmc-dkbX_WI-58GSUQwxilfM) and [SV](https://content.engageny.org/file/50546/download/algebra-i-m1-topic-c-lesson-14-student.pdf?token=KqiYTitlQsO83A8daDJAo3XmGmupch87AZRChbGG9UY) |
| 1 | Compound Inequalities |  | **EngageNY Algebra - Module 1**Topic C: Lesson 15 – [TV](https://content.engageny.org/file/50606/download/algebra-i-m1-topic-c-lesson-15-teacher.pdf?token=KohSMl4Vur37zIHKmWYW0WYHnH8sCNTqCP5urcub4Bk) and [SV](https://content.engageny.org/file/50596/download/algebra-i-m1-topic-c-lesson-15-student.pdf?token=UOV46ZVabsjY4SzZI5gR1YjAs0Q8M-_tsb_rJtPh3VE) |
| 1 | Graphing Compound Inequalities |  | **EngageNY Algebra - Module 1**Topic C: Lesson 16 – [TV](https://content.engageny.org/file/50636/download/algebra-i-m1-topic-c-lesson-16-teacher.pdf?token=GkKUjhyoIh0cPwsXaUn2OWzWEK-Q7J4kd5hYdfpfTLg) and [SV](https://content.engageny.org/file/50626/download/algebra-i-m1-topic-c-lesson-16-student.pdf?token=kn6rik_OXyX22ngUX9XcY_dyH4_EB9swvdKmP6-Fr_k) |
| 1 | Comparing Equations and Inequalities |  | **(Blackboard Resource)**[Comparing Equations & Inequalities](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/comparing_equations_and_inequalities.pdf) |
| 2 | Review Assessment on Inequalities |  |  |
| 2 | A-REI.2.3 | Writing Expressions using the Distributive Property |  | **EngageNY Algebra - Module 1**Topic B: Lesson 6 – [TV](https://content.engageny.org/file/50281/download/algebra-i-m1-topic-b-lesson-6-teacher.pdf?token=h8KU_eTaDbyDpHoraoocY8J31Lp6c2ulStJC5iali2I) and [SV](https://content.engageny.org/file/50276/download/algebra-i-m1-topic-b-lesson-6-student.pdf?token=l7EDL7ujJvyiFWNwqSdiy4qNMBVNChsseJKHsjPuv6w) |
| 2 | Writing Expressions using the Commutative and Associative Properties |  | **EngageNY Algebra - Module 1**Topic B: Lesson 7 – [TV](https://content.engageny.org/file/50306/download/algebra-i-m1-topic-b-lesson-7-teacher.pdf?token=4c9V10cjcZf2KZTmSxVFmm7xe1qa60D1PHXg4e3lYa0) and [SV](https://content.engageny.org/file/50301/download/algebra-i-m1-topic-b-lesson-7-student.pdf?token=wdCvbJPk2giMWGmmKf8cFqkgSAYOM-n2pDn7GEpVWIc) |
| 1 | Assessment on Writing Expressions |  |  |
| 4 | Interpreting Graphs |  | **(Blackboard Resource)**[Interpreting Graphs Activity](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/interpreting_graphs.pdf) |
| 5 days |  | Cumulative Review (2 days) / Final Exams (3 days) |  |  |