Huntsville City Schools
2020 - 2021 Pacing Guide
8th Grade Math

Math Practices:

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

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.

Important Notes:

- Alabama Course of Study objectives are given by number
- This curriculum map's standards are aligned to the 2016 Alabama Course of Study.
- Resources and Instructional Strategies are suggestions for the topic studied; teachers are not required to use all resources listed and can supplement their teaching with additional resources that support the Course of Study Standards.
- The number of days listed are approximate and are padded to allow a little extra time for review and tests
- The problems listed for each section are suggested types of problems. Teachers can still assign even, odd, or selected problems from each type of problem.
- Students will be allowed to use scientific or graphing calculators on midterm & final exams, and most tests (teacher's discretion).
    - Please reference the ACAP Math Item Specifications Grade 8 for information about which standards will have access to a calculator on the ACAP assessment.

Online Resources:

- Freckle, Math – Freckle math not only offers additional practice for students, but also Inquiry Based Lessons, and Constructed Response passages by Common Core State Standards: Accessible through Clever
- MARS - Mathematics Assessment Resource Service – formative assessments and group activities: http://map.mathshell.org/lessons.php
- Geogebra – In addition to offering powerful calculators and graphing tools, Geogebra offers many interactive activities by Common Core State Standard: https://www.geogebra.org/
- Khan Academy – Example videos and practice activities that may be of additional help to students: https://www.khanacademy.org/
- Shmoop – Teachers and students can use Shmoop to view videos and practice on various math topics searchable by Common Core State Standard: https://www.shmoop.com/
- Dan Meyer's Ted Talk about teaching math: https://youtu.be/qocAoN4jNwc
    - Links to Dan Meyer's 3-act activities, sorted by standard: https://docs.google.com/spreadsheet/ccc?key=0AjIqyKM9d7ZYdEhtR3BJMmdBWnM2YWxWYVM1UWowTEE#gid=0
- Granite City Math Vocabulary: http://www.graniteschools.org/mathvocabulary/
- Open Curriculum - activities from all over the internet sorted by standard: www.opencurriculum.org
- Illustrative Mathematics: https://im.kendallhunt.com/
    - Teachers must use their school email address to create a free account to access the teacher-only resources
- MARS - Mathematics Assessment Resource Service – formative assessments and group activities: http://map.mathshell.org/lessons.php
- Desmos – free online calculator – excellent for working with linear equations, scatterplots, and best-fit lines : www.desmos.com
    - Teacher version includes lessons and activities: https://teacher.desmos.com/
- Illuminations – lessons developed by NCTM: http://illuminations.nctm.org/
- Create a MyMathLab instructors course using the book: It is a good resource for material on all the topics in this course. You can pull problems from it in MyMathLab also.

Instructional Strategies:
ELLevation: Note: Be sure to check the "Math Collection" for specific topic resources"

Build Background:
* Brainstorm Walk * I Notice, I Wonder

Clarify Input:
* "5 and 2" * Anchor Charts * Essential Questions * Guided Notes * "Teach! Teach!" * TPR

Fortify Output:
* Find Your Match * Clock Buddies * Think, Write, Pair Share * Which Corner?

Foster Interactions:
* "Don't Mention it" * Find the Fib

Develop Academic Language:
* 360 Words * Word Walls

Assess Language and Learning:
* Wordless Books * Whiteboard Checkpoints * Differentiated Question Prompts

ARI/Instructional Strategies (Alabama Reading Initiative)

ARI represents the Alabama Reading Initiative. Below are ARI/Instructional strategies that can be easily adapted to work well with mathematics. Some of the strategies can be interchangeable between before, during, and after in lesson planning. There are many instructional strategies that can be used in the classroom and you are not limited to these alone. If you have other ARI/Instructional strategies that work well for you and your students, use them to assist with academic growth and development. Have fun experimenting with different strategies to reach all students and address the different learning styles.

Suggested time period	ARI/Instructional Strategy	Explanation/How to use the strategy
Before:	Admit Slip	Purpose: 1) reflect on content of previous lesson or learned concept The admit-slip strategy requires students to write responses to questions you pose at the beginning of class. Admit slips help students reflect on what they have learned and express what or how they are thinking about the information. Admit slips easily incorporate writing into your content area classroom and require students to think critically.
	KWL	Purposes: 1) link prior knowledge to new information 2) generate questions to guide meaningful learning 3) create own meaning and learning from new text Procedure: 1. On the whiteboard, on a handout, or on students' individual clean sheets, three columns should be drawn. 2. Label Column 1 K, Column 2 W, Column 3 L. 3. Before reading, viewing or listening, students fill in the Know column with words, terms, or phrases from their background or prior knowledge. If the students are drawing on a topic previously learned, then the K column may be topic related. But if the topic is something brand-new, and they don't know anything much about it, you should use the K column to have them recalling a similar, analogous, or broader idea. 4. Then have students generate questions about what they might learn or want to learn about the topic, which might follow a quick glance at the topic headings, pictures, problems and charts that are found in the text or on a handout provided. This helps set their purpose for the lesson or concept and focuses their attention on key ideas. 5. After the math lesson and reading, students should fill in their new knowledge gained from the content. They can also clear up misperceptions about the topic which might have shown up in the Know column before they learned anything about the topic. This is the stage of metacognition: Does the student fully understand?
	Think Pair Share	Purposes: There are a variety of uses for this activity 1) Think. The teacher provokes students' thinking with a problem, question, prompt or observation. The students should take a few moments just to THINK about the question and jot down their thoughts. 2) Pair with someone…Using designated partners, nearby neighbors, or a desk mate, students PAIR up to talk about the answer each came up with. They compare their mental or written notes and identify the answers they think are best, most convincing, or most unique. 3) Share. After students talk in pairs for a few moments, the teacher calls for pairs to SHARE their thinking with the rest of the class. Sharing can be accomplished in a variety of ways: going around in round-robin fashion, calling on each pair, taking answers as they are called out (or as hands are raised), pairing with another pair. Often, the teacher or a designated helper will record these responses on the board or on the overhead.

	Quick Write	Purposes: 1) introduce a concept and connect this concept with prior knowledge or experiences and 2) allow students to discuss and learn from each other Procedure: 1. Introduce a single word, phrase, problem, or question to the class. 2. Students copy the concept on index cards or sheet of paper. 3. Students are given two to five minutes to write whatever comes to their minds relative to the concept. They may write freely using single words, phrases, sentences, etc. 4. After time is called, students may volunteer to share their thoughts on the subject.
	Turn and Talk/ Table Talk	Purposes: 1) activate prior knowledge, 2) build background knowledge, 3) encourage active listening, and 4) set a purpose for concept/lesson or reading Procedure: 1. Write a thought-provoking statement or question related to the subject of the upcoming lesson on the whiteboard or project overhead. 2. Each student has two minutes to read the question or statement, reflect, and write a response. 3. Each student has three minutes to share his/her response with a partner, reflect, and write a response to his/her partner's statement. 4. Pairs combine to form small groups of 4-6 students. Responses are shared within the group and one response is chosen to share with the whole class.
	Bell Ringer/Bell Work/Warm Up	Bell ringers are questions or tasks posted before students enter the classroom. They are to be completed before class starts, or, as the name suggests, as the bell rings. Bell ringers provide benefits to both the student and the teacher in all classroom settings ranging from elementary to high school. Bell ringers help to encourage promptness, organization, responsibility, spark prior knowledge, reinforce concepts, promote student engagement and so much more.
During:	Think Pair Share	Purposes: There are a variety of uses for this activity 1) Think. The teacher provokes students' thinking with a problem, question, prompt, or observation. The students should take a few moments just to THINK about the question and jot down their thoughts. 2) Pair with someone…Using designated partners, nearby neighbors, or a desk mate, students PAIR up to talk about the answer each came up with. They compare their mental or written notes and identify the answers they think are best, most convincing, or most unique. 3) Share. After students talk in pairs for a few moments, the teacher calls for pairs to SHARE their thinking with the rest of the class. Sharing can be accomplished in a variety of ways: going around in round-robin fashion, calling on each pair, taking answers as they are called out (or as hands are raised), pairing with another pair. Often, the teacher or a designated helper will record these responses on the board or on the overhead.

	Turn and Talk/ Table Talk	Purposes: 1) activate prior knowledge, 2) build background knowledge, 3) encourage active listening, and 4) set a purpose for concept/lesson or reading Procedure: 1. Write a thought-provoking statement or question related to the subject of the upcoming lesson on the chalkboard. 2. Each student has two minutes to read the topic, reflect, and write a response. 3. Each student has three minutes to share his/her response with a partner, reflect, and write a response to his/her partner's statement. 4. Pairs combine to form small groups of 4-6 students. Responses are shared within the group and one response is chosen to share with the whole class.
	Jot Notes	Jot Notes are basically lesson notes the students jot down before, during and after the lesson (in some cases) …The notes can be given in a variety of formats or structures…Example: chart format, graphic organizer, table format, guided notes, foldables, etc.…
	Quadrant Cards / Frayer Model	Purposes: 1) motivate students to engage in vocabulary study and expand vocabulary 2) Reinforce concepts etc.…. Procedure: Divide a sheet of paper into four parts Adapt to meet your students' needs…. whether you want to emphasize on vocabulary, connecting concepts, or organizing steps or procedures for graphing or solving etc.…
	Venn Diagram	Purpose: compare concepts Procedure: 1. Draw two circles overlapping. Each circle represents a concept. 2. Unique characteristics of the two ideas being compared are recorded in the outer of the two overlapping circles. Common characteristics are recorded where the circles overlap. 3. Teacher should model the strategy first.

	Charts/Foldables	Purposes: 1) engage with concept/lesson/text 2) construct graphic organizer/chart/foldable 3) self-monitor comprehension Procedure: 1. Create a Jot Chart, project on the whiteboard or produce a print copy for each student. The chart/matrix should be structured as follows. You can also use foldables to accomplish these tasks. o Main ideas/items for description or analysis are listed across the top of the chart. o Question/characteristics of the main concepts are listed down the left side of the chart. 2. Discuss the purpose of the chart with students before the assignment. Give an example of a completed chart to help clarify its functions. 3. Have students complete the chart or foldable as you go through the lesson or assign tasks to groups etc...As the teacher, you decide and adapt this to meet the needs of your students and what you want to accomplish from the task. 4. Discuss the students' findings and compile the results into a group chart. Stress the relationships between the data in the chart.
	Partner Learning	Purpose: 1) To engage students in the content and spark meaningful discussions 2) To encourage collaboration and improve knowledge among students 3) Promote socialization and boost self-esteem 4) Reinforce concepts taught through open questioning and answer sessions Procedure: The students are paired up and given a task to complete together; open discussions, sharing of ideas, writing, final product presentation, etc....
	Concept Map	Purpose: activate and organize knowledge about a specific topic Procedure: 1. Select the main idea or topic of discussion; write it on a chart, overhead, or whiteboard; and put a circle around it. 2. Have students brainstorm subtopics; knowledge related to the topic. Use lines to connect to the main topic. 3. Have students brainstorm specific vocabulary, ideas, mathematical knowledge related to each subtopic. Record these ideas beneath each subtopic. Add new knowledge to the concept map as learning progresses.
	Graphic Organizer	Purposes: 1) provide a visual model of the structure of lesson and 2) provide a format for organizing information and concepts Procedure: 1. Introduce the graphic organizer to the students. Demonstrate how it works by noting key concepts and ideas on the organizer. 2. Have groups of students practice using the graphic organizer with ideas from independently read mathematical text and/or mathematical information presented during lessons. Students can share their ideas with the class. 3. Choose an organizer that matches what you want to accomplish with your students for the topic or lesson.

	Jigsaw	Purposes: 1) engage with mathematical concept or text 2) self-monitor comprehension 3) integrate new information with prior knowledge 4) respond to mathematical concept or text through discussion Procedure: 1. Divide class into 4-6 member groups; each member becomes an expert on a different topic/concept assigned by teacher. 2. Members of the teams with the same topic meet in an expert group with a variety of resource materials and texts available to explore their topic. 3. The students prepare how they will teach the information to others. 4. Everyone returns to their jigsaw (home) teams to teach what they learned to the other members. It may be helpful to supply each student with a graphic organizer for note taking purposes. 5. Team members listen and take notes as their classmate teaches them
After:	Cooperative Learning/ Partner Learning/Practice	Cooperative learning is the process of breaking a classroom of students into small groups so they can discover a new concept together and help each other learn. Each group is given a task or assignment to complete. Often a record keeper and team leader are assigned to keep everyone on task. Collaboration and discussion are expected with a final assignment or project completed and submitted. Open discussions between the teacher and/or students can occur during class as well.
	Stations/ Carousels etc.…	Purposes: This strategy can fit almost any purpose developed. Procedure: 1. Teacher determines what topics/lessons will be placed on chart paper. 2. Chart paper is placed on walls around the room. 3. Teacher places students into groups of three- four. 4. Students begin at a designated chart. 5. They read the question or phrase, discuss with group, and respond directly on the chart or assigned task sheet. 6. After an allotted amount of time, students rotate to next chart. 7. Students read next question and records new response or discussion points. 8. Continue until each group has responded to each prompt. 9. Teacher shares information from charts and conversations heard while responding. ** This strategy can be modified by having the chart “carousel” to groups, rather than groups moving to chart.

	Exit slip	Purpose: 1) reflect on content of lesson The exit-slip strategy requires students to write responses to questions you pose at the end of class. Exit slips help students reflect on what they have learned and express what or how they are thinking about the new information. Exit slips easily incorporate writing into your content area classroom and require students to think critically. There are three categories of exit slips (Fisher & Frey, 2004): • Prompts that document learning, o Ex. Write one thing you learned today. o Ex. Discuss how today's lesson could be used in the real world. • Prompts that emphasize the process of learning, o Ex. I didn't understand… o Ex. Write one question you have about today's lesson. • Prompts to evaluate the effectiveness of instruction o Ex. Did you enjoy working in small groups today?
	Turn and Talk/Table Talk	Purposes: 1) activate prior knowledge, 2) build background knowledge, 3) encourage active listening, and 4) set a purpose for concept/lesson or reading Procedure: 1. Write a thought-provoking statement or question related to the subject of the upcoming lesson on the whiteboard or project overhead. 2. Each student has two minutes to read the question or statement, reflect, and write a response. 3. Each student has three minutes to share his/her response with a partner, reflect, and write a response to his/her partner's statement. 4. Pairs combine to form small groups of 4-6 students. Responses are shared within the group and one response is chosen to share with the whole class.

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	Hands on Activity/ Graphs, charts, diagrams, etc.	Hand on activities are simply activities which students physically in some way connect with their learning…writing, drawing, graphing, demonstration through movement, use of manipulatives etc.… Hands-on activities are especially important in the classroom because it allows students to engage in kinesthetic learning. Educational studies have shown that kinesthetic learning, where a student performs some type of physical activity rather than just listening to a lecture, is the most popular type of learning with students - doing or working on something before, during, and/or after the lesson, helps them to gain a better understanding of the material. It allows students to experiment with trial and error, learn from their mistakes, and understand the potential gaps between theory and practice. It also encourages students to collaborate with their peers and share information from different perspectives.

Formatting:

- Honors or advanced material is highlighted in blue. Example: Advanced: Page 145 #75-86
- Remediation is highlighted in yellow. Example: Remediation: Small group on fractions

The Textbook for this course is:

enVisionmath2.0 Grade 8

Huntsville City Schools
2020 - 2021 Pacing Guide
8th Grade Math

First Semester
1st 9 – weeks (August 17 – October 23)
44 instructional days; 22 A-Days and 22 B-Days

Time Period	Unit Topic	Standards	Resources
Week 1	Introduction & Review	During the initial week of school, it is important for teachers to set procedures for their classroom as well as access student prior knowledge. Use this week to access/review these skills or others identified as a need: Integer Operations Review Fractions Review Place Value Review	enVision: Intervention Lessons Cluster 1 – Place Value Cluster 9 – Fraction Number Sense Cluster 13 – Ratios Cluster 21 – Integers Integer Operations Foldable Fraction Review Foldable Place Value Foldable

Week 2	Rational & Irrational Numbers (Two Weeks)	1. Define the real number system as composed of rational and irrational numbers. a. Explain that every number has a decimal expansion; for rational numbers, the decimal expansion repeats or terminates. b. Convert a decimal expansion that repeats into a rational number.	EnVision Unit 1 – Real Numbers 1-1 Rational Numbers as Decimals 1-2 Understand Irrational Numbers MARS lesson: Classifying Rational and Irrational Numbers Translating Between Repeating Decimals and Fractions Card Sorting Activity Inquiry Based Lesson: Irrational Numbers – Selling Chicken Eggs Real Number System Venn Diagram
Week 3	Rational & Irrational Numbers	2. Locate rational approximations of irrational numbers on a number line, compare their sizes, and estimate the values of the irrational numbers. 4. Use square root and cube root symbols to represent solutions to equations. a. Evaluate square roots of perfect squares (less than or equal to 225) and cube roots of perfect cubes (less than or equal to 1000). b. Explain that the square root of a non-perfect square is irrational.	EnVision Unit 1 – Real Numbers 1-3 Compare and Order Real Numbers Estimating Square Roots Activity Squares and Square Roots Activity EnVision Unit 1 – Real Numbers 1-4 Evaluate Square Roots and Cube Roots Illuminations- Square Roots Go Rational lesson Inquiry Based Lesson: Square Roots & Cube Roots – Building Recovery Tubs for Athletes Square Roots Cube Roots Foldable

Week 4	Solving Linear Equations (Three Weeks)	Begin this unit my assessing/reviewing/remediating knowledge on solving one- and two-step equations, including using the distributive property.	enVision: Intervention Lessons Cluster 25 – Equations One Step Equation Review: Solving One-Step Equations Example Video Khan Academy: Solving One-Step Equations Review Modeling One-step Equations Example One-step Equation Word Problem (Yoga 1) One-step Equation Word Problem (Yoga 2) Solving One-Step Equations Worksheet Solving Equations One- and Two-Step
Week 5	Solving Linear Equations	11. Solve multi-step linear equations in one variable, including rational number coefficients, and equations that require using the distributive property and combining like terms. a. Determine whether linear equations in one variable have one solution, no solution, or infinitely many solutions of the form x = a, a = a, or a = b (where a and b are different numbers). b. Represent and solve real-world and mathematical problems with equations and interpret each solution in the context of the problem.	EnVision Unit 1 – Real Numbers 1-5 Solve Equations Using Square Roots and Cube Roots EnVision Unit 2 – Analyze and Solve Linear Equations 2-1 Combine Like Terms to Solve Equations 2-2 Solve Equations with Variables on Both Sides 2-3 Solve Multistep Equations 2-4 Equations with No Solution or Infinitely Many Solutions 3-Act Math Modeling: Powering Down Sometimes, Always or Never Types of Solutions Foldable Inquiry Based Lesson: Solutions of Linear Equations – Assessing Risk in the Stock Market MARS: Solving Linear Equations in One Variable Building and Solving Linear Equations

Week 6	Solving Linear Equations	11. Solve multi-step linear equations in one variable, including rational number coefficients, and equations that require using the distributive property and combining like terms. a. Determine whether linear equations in one variable have one solution, no solution, or infinitely many solutions of the form x = a, a = a, or a = b (where a and b are different numbers). b. Represent and solve real-world and mathematical problems with equations and interpret each solution in the context of the problem.	EnVision Unit 1 – Real Numbers 1-5 Solve Equations Using Square Roots and Cube Roots EnVision Unit 2 – Analyze and Solve Linear Equations 2-1 Combine Like Terms to Solve Equations 2-2 Solve Equations with Variables on Both Sides 2-3 Solve Multistep Equations 2-4 Equations with No Solution or Infinitely Many Solutions 3-Act Math Modeling: Powering Down Sometimes, Always or Never MARS: Solving Linear Equations in One Variable Building and Solving Linear Equations Types of Solutions Foldable Inquiry Based Lesson: Solutions of Linear Equations – Assessing Risk in the Stock Market
Week 7	Integer Exponents & Scientific Notation (Three Weeks)	3. Develop and apply properties of integer exponents to generate equivalent numerical and algebraic expressions.	enVision: Intervention Lessons Cluster 18 – Exponents EnVision Unit 1 – Real Numbers 1-6 Use Properties of Integer Exponents 1-7 More Properties of Integer Exponents MARS: Applying Properties of Exponents Inquiry Based Lesson: Generate Equivalent Expressions – Deadly Diseases Integer Exponent Foldable

Week 8		5. Estimate and compare very large or very small numbers in scientific notation.	EnVision Unit 1 – Real Numbers 1-8 Use Powers of 10 to Estimate Quantities 1-9 Understand Scientific Notation 3-Act Math Modeling: Hard-Working Organs MARS: Estimating Length Using Scientific Notation Powers of Ten Video Inquiry Based Lesson: Scientific Notation – Our Solar System
Week 9		6. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. a. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. b. Interpret scientific notation that has been generated by technology.	EnVision Unit 1 – Real Numbers 1-10 Operations with Numbers in Scientific Notation How Many Stars are there in the Universe? Inquiry Based Lesson: Operations in Scientific Notation – Designing a Computer

2nd 9 – weeks (October 26 – December 22)
38 instructional days; 19 A-Days and 19 B-Days

Time Period	Unit Topic	Standards	Resources
Week 1	Graphing Linear Equations (Two Weeks)	7. Determine whether a relationship between two variables is proportional or non-proportional. 8. Graph proportional relationships. a. Interpret the unit rate of a proportional relationship, describing the constant of proportionality as the slope of the graph which goes through the origin and has the equation y = mx where m is the slope.	enVision: Intervention Lesson Cluster 15 Proportional Reasoning EngageNY - Identifying Proportional and Non-Proportional Relationships in Graphs EnVision Unit 2 – Analyze and Solve Linear Equations 2-5 Compare Proportional Relationships OGAP question bank: Rates - Distance, Rates, and Time MARS: Comparing Value for Money: Baseball Jerseys Comparing Fuel Consumption: Buying Cars

Week 2	Graphing Linear Equations	9. Interpret y = mx + b as defining a linear equation whose graph is a line with m as the slope and b as the y-intercept. a. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in a coordinate plane. b. Given two distinct points in a coordinate plane, find the slope of the line containing the two points and explain why it will be the same for any two distinct points on the line. c. Graph linear relationships, interpreting the slope as the rate of change of the graph and the y-intercept as the initial value. d. Given that the slopes for two different sets of points are equal, demonstrate that the linear equations that include those two sets of points may have different y-intercepts. 10. Compare proportional and non-proportional linear relationships represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions) to solve real-world problems.	EnVision Unit 2 – Analyze and Solve Linear Equations 2-6 Connect Proportional Relationships and Slope 2-7 Analyze Linear Equations: y = mx 2-8 Understand the y-intercept of a line 2-9 Analyze Linear Equations y = mx + b NCTM Illuminations: Just Slope Geogebra: Slope Intercept Form Khan Academy: Slope From a Graph Texas Gateway: Comparing and Contrasting Proportional and Non-Proportional Linear Relationships Inquiry Based Lesson: Using Graphs to Determine Slope - Population Growth Slope and Similar Triangles – Exploring Ancient Egypt
Week 3	Define & Compare Functions (Two Weeks)	13. Determine whether a relation is a function, defining a function as a rule that assigns to each input (independent value) exactly one output (dependent value), and given a graph, table, mapping, or set of ordered pairs. 14. Evaluate functions defined by a rule or an equation, given values for the independent variable.	EnVision Unit 3 – Use Functions to Model Relationships 3-1 Understand Relations and Functions 3-2 Connect Representations of Functions Math Playground: Function Machine Illustrative Math: Function Rules Inquiry Based Lesson: What is a Function – Cancer Research Evaluating Functions Worksheets Khan Academy: Evaluate Functions Example Evaluating a Function Example (graph)

Week 4	Define & Compare Functions	15. Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions. a. Distinguish between linear and non-linear functions.	EnVision Unit 3 – Use Functions to Model Relationships 3-3 Compare Linear and Nonlinear Functions 3-Act Math Modeling: Every Drop Counts Inquiry Based Lesson: Comparing Functions – Analyzing Tech Sales
Week 5	Linear Functions (Two Weeks)	16. Construct a function to model a linear relationship between two variables. a. Interpret the rate of change (slope) and initial value of the linear function from a description of a relationship or from two points in a table or graph.	EnVision Unit 3 – Use Functions to Model Relationships 3-4 Construct Functions to Model Linear Relationships Khan Academy Interpreting Linear Graphs Inquiry Based Lesson: Linearity – Homeownership Costs Linear Relationships – The Aftermath of the Deepwater Horizon Oil Spill
Week 6	Linear Functions	17. Analyze the relationship (increasing or decreasing, linear or non-linear) between two quantities represented in a graph.	EnVision Unit 3 – Use Functions to Model Relationships 3-5 Intervals of Increase and Decrease 3-6 Sketch Functions from Verbal Descriptions Robert Kaplinsky: How Many Hot Dogs Did They Eat? Inquiry Based Lesson: Interpreting Functions – The Housing Market
Week 7	Scatter Plots	18. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities, describing patterns in terms of positive, negative, or no association, linear and non-linear association, clustering, and outliers. 19. Given a scatter plot that suggests a linear association, informally draw a line to fit the data, and assess the model fit by judging the closeness of the data points to the line. 20. Use a linear model of a real-world situation to solve problems and make predictions. a. Describe the rate of change and y-intercept in the context of a problem using a linear model of a real-world situation.	EnVision Unit 4 – Investigate Bivariate Data 4-1 Construct and Interpret Scatter Plots 4-2 Analyze Linear Associations 4-3 Use Linear Models to Make Predictions Illustrative Mathematics: Texting and Grades Inquiry Based Lesson: Construct & Interpret Scatter Plots – Olympic Success Inquiry Based Lesson: Linear Equations – Genetically Modified Organisms

Week 8	Relative Frequency	21. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects, using relative frequencies calculated for rows or columns to describe possible associations between the two variables.	EnVision Unit 4 – Investigate Bivariate Data 4-4 Interpret Two-Way Frequency Tables 4-5 Interpret Two-Way Relative Frequency Tables 3-Act Math Modeling: Reach Out Inquiry Based Lesson: Bivariate Categorical Data – Class Officer Duties
Week 9	Catch-up	Use this time to catch up due to remediation, testing, weather, sickness, ect.	**Note:** This week provides time to review and test

Second Semester

3rd 9 – weeks (January 4 – March 12)

48 instructional days; 24 A-Days and 24 B-Days

Time Period	Unit Topic	Standards	Resources
Week 1	Systems of Equations (Three Weeks)	12. Solve systems of two linear equations in two variables by graphing and substitution. a. Explain that the solution(s) of systems of two linear equations in two variables corresponds to points of intersection on their graphs because points of intersection satisfy both equations simultaneously. b. Interpret and justify the results of systems of two linear equations in two variables (one solution, no solution, or infinitely many solutions) when applied to real-world and mathematical problems.	Emergent Math: Racing the Squirrel Guy EnVision Unit 5 – Analyze and Solve Systems of Linear Equations 5-1 Estimate Solutions by Inspection 5-2 Solve Systems by Graphing 5-3 Solve Systems by Substitution 5-4 Solve Systems by Elimnatikon 3-Act Math Modeling: Ups and Downs Geogebra: Solving Linear Systems by Graphing: Quiz (V1)
Week2	Systems of Equations (Three Weeks)	12. Solve systems of two linear equations in two variables by graphing and substitution. a. Explain that the solution(s) of systems of two linear equations in two variables corresponds to points of intersection on their graphs because points of intersection satisfy both equations simultaneously. b. Interpret and justify the results of systems of two linear equations in two variables (one solution, no solution, or infinitely many solutions) when applied to real-world and mathematical problems.	Emergent Math: Racing the Squirrel Guy EnVision Unit 5 – Analyze and Solve Systems of Linear Equations 5-1 Estimate Solutions by Inspection 5-2 Solve Systems by Graphing 5-3 Solve Systems by Substitution 5-4 Solve Systems by Elimnatikon 3-Act Math Modeling: Ups and Downs Geogebra: Solving Linear Systems by Graphing: Quiz (V1)

Week 3	Systems of Equations (Three Weeks)	12. Solve systems of two linear equations in two variables by graphing and substitution. a. Explain that the solution(s) of systems of two linear equations in two variables corresponds to points of intersection on their graphs because points of intersection satisfy both equations simultaneously. b. Interpret and justify the results of systems of two linear equations in two variables (one solution, no solution, or infinitely many solutions) when applied to real-world and mathematical problems.	Emergent Math: Racing the Squirrel Guy EnVision Unit 5 – Analyze and Solve Systems of Linear Equations 5-1 Estimate Solutions by Inspection 5-2 Solve Systems by Graphing 5-3 Solve Systems by Substitution 5-4 Solve Systems by Elimnatikon 3-Act Math Modeling: Ups and Downs Geogebra: Solving Linear Systems by Graphing: Quiz (V1)
Week 4	Pythagorean Theorem (Two Weeks)	26. Informally justify the Pythagorean Theorem and its converse. 28. Apply the Pythagorean Theorem to determine unknown side lengths of right triangles, including real-world applications	EnVision Unit 7 – Understand and Apply the Pythagorean Theorem 3-Act Math Modeling: Go with the Flow 7-1 Understand the Pythagorean Theorem 7-2 Understand the Converse of the Pythagorean Theorem 7-3 Apply the Pythagorean Theorem to Solve Problems Geogebra: Graphical Pythagorean Theorem Proof Khan Academy: Pythagorean Theorem Example 1 Pythagorean Theorem Example 2 Inquiry Based Lesson: Triangle Applications – Fighting Wildfires Pythagorean Theorem – Designing a Public Square
Week 5	Pythagorean Theorem (Two Weeks)	27. Apply the Pythagorean Theorem to find the distance between two points in a coordinate plane.	EnVision Unit 7 – Understand and Apply the Pythagorean Theorem 7-4 Find Distance in the Coordinate Plane Inquiry Based Lesson: Triangles in Coordinate Plane – Building Highways in Texas

Week 6	Congruence (Two Weeks)	22. Verify experimentally the properties of rigid motions (rotations, reflections, and translations): lines are taken to lines, and line segments are taken to line segments of the same length; angles are taken to angles of the same measure; and parallel lines are taken to parallel lines. a. Given a pair of two-dimensional figures, determine if a series of rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are congruent; describe the transformation sequence that verifies a congruence relationship.	EnVision Unit 6 – Congruence and Similarity 6-1 Analyze Translations 6-2 Analyze Reflections 6-3 Analyze Rotations 6-4 Compose Transformations Geogebra: Reflections Across Axes Inquiry Based Lesson: Line Transformations – Engineering Electric Cars Congruence – Engineering Microprocessors
Week 7	Congruence	23. Use coordinates to describe the effect of transformations (dilations, translations, rotations, and reflections) on two dimensional figures.	EnVision Unit 6 – Congruence and Similarity 3-Act Math Modeling: Tricks of the Trade 6-5 Understand Congruent Figures Inquiry Based Lesson: 2D Transformations – Animating a Movie
Week 8	Similarity	24. Given a pair of two-dimensional figures, determine if a series of dilations and rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are similar; describe the transformation sequence that exhibits the similarity between them.	EnVision Unit 6 – Congruence and Similarity 6-6 Describe Dilations 6-7 Understand Similar Figures OGAP question bank- Similarity
Week 9	Catch-up	Use this time to catch up due to remediation, testing, weather, sickness, ect.	**Note:** This week provides time to review and test

4th 9 – weeks (March 15 – May 28)
46 instructional days; 23 A-Days and 23 B-Days
+4 Exam Days

Time Period	Unit Topic	Standards	Resources
Week 1	Area/Circle Review	The next topic in the 8th grade math standards is volume of cylinders, cones, and spheres. Teachers should review circles and the area of basic polygons as needed	Khan Academy Area of a Parallelogram Area of a Circle Area of a Triangle
Week 2	Volume (Two Weeks)	29. Informally derive the formulas for the volume of cones and spheres by experimentally comparing the volumes of cones and spheres with the same radius and height to a cylinder with the same dimensions.	Cones and Spheres
Week 3	Volume	30. Use formulas to calculate the volumes of three-dimensional figures (cylinders, cones, and spheres) to solve real world problems	EnVision Unit 8 – Solve Problems Involving Surface Area and Volume 8-1 Find Surface Area of Three-Dimensional Figures 8-2 Find Volume of Cylinders 8-3 Find Volume of Cones 8-4 Find Volume of Spheres 3-Act Math Modeling: Measure Up Khan Academy: Volume of Cylinder - Example Volume of Cylinders - Practice Activity Volume of Cones - Example Volume of Cones - Practice Activity Volume of Spheres - Example Inquiry Based Lesson: Cones, Cylinders, & Spheres – Comparing Ice Cream Cones

Week 4	Angles (Two Weeks)	25. Analyze and apply properties of parallel lines cut by a transversal to determine missing angle measures. a. Use informal arguments to establish that the sum of the interior angles of a triangle is 180 degrees	EnVision Unit 6 – Congruence and Similarity 6-8 Angles, Lines, and Transversals 6-9 Interior and Exterior Angles of Triangles Geogebra: Parallel Lines and Non-Parallel Lines Cut by a Transversal Angle Pairs Inquiry Based Lesson: Informal Arguments – Designing Rollercoasters
Week 5	Angles (Two Weeks)	25. Analyze and apply properties of parallel lines cut by a transversal to determine missing angle measures. a. Use informal arguments to establish that the sum of the interior angles of a triangle is 180 degrees	EnVision Unit 6 – Congruence and Similarity 6-8 Angles, Lines, and Transversals 6-9 Interior and Exterior Angles of Triangles Geogebra: Parallel Lines and Non-Parallel Lines Cut by a Transversal Angle Pairs Inquiry Based Lesson: Informal Arguments – Designing Rollercoasters
Week 6 – Week 9		In anticipation of ACAP testing, all Alabama 8th Grade Math standards should be addressed by this point. Please use the following weeks to review/remediate/reteach difficult concepts for students. Also, enrichment activities can be offered for advanced students.	