Mathematics
Geometry: Year at a Glance
2019 - 2020

Quarter 1	Quarter 2	Quarter 3	Quarter 4
Aug. 12 – Oct. 11	**Oct. 21 - Dec. 20**	**Jan. 6 – Mar. 13**	**Mar. 23 – May 22 TN Ready Testing Apr. 13 - May 8**
Tools of Geometry, Reasoning and Proof, Lines and Angles, Triangle Congruence with Applications	**Transformations and Congruence, Transformations and Symmetry, Similarity and Transformations, Using Similar Triangles, Properties of Quadrilaterals with Coordinate Proofs**	**Properties of Triangles, Special Segments in Triangles, Trigonometry with Right Triangles, Trigonometry with All Triangles, Properties of Angles and Segments in Circles**	**Properties of Circles, Arc Length, Sector Area, and Equations of Circles, Measurement and Modeling in Two and Three Dimensions, Volume Formulas, Visualizing Solids, Trigonometry with All Triangles**
G.CO.A.1	G.CO.A.2	G.CO.A.1	G.CO.D.12
G.CO.A.2	G.CO.A.3	G. SRT.A.1	G.C.A.2
G.CO.B.7	G.CO.A.4	G. SRT.A.2	G.C.A.3
G.CO.B.8	G.CO.A.5	G. SRT.A.3	G.C.B.4
G.CO.C.9	G.CO.B.6	G. SRT.B.4	G. GPE.A.1
G.CO.C.10	G.CO.B.7	G. SRT.B.5	G. GPE.B.2
G.CO.D.12	G.CO.C.11	G. SRT.C.6	G. GPE.B.4
G. GPE.B.2	G. GPE.B.2	G. SRT.C.7	G.MG.A.1
G. GPE.B.3	G. GPE.B.5	G. SRT.C.8	G. MG.A.2
G. GPE.B.5	G.MG.A.1	G. MG.A.2	G. GMD.A.1
	G.MG.A.2	G. GMD.A.1	G. GMD.A.2
	G.SRT.A.1	G.C.A.1	
	G.SRT.A.2	G.C.A.2	
	G. SRT.B.4		
	G. SRT.B.5		
	G.SRT.C.6		

Major Content	Supporting Content

Key:

Note: Please use this suggested pacing as a guide. It is understood that teachers may be up to 1 week ahead or 1 week behind depending on the needs of their students.

Introduction

Destination 2025, Shelby County Schools' 10-year strategic plan, is designed not only to improve the quality of public education, but also to create a more knowledgeable, productive workforce and ultimately benefit our entire community.

What will success look like?

In order to achieve these ambitious goals, we must collectively work to provide our students with high quality, college and career ready aligned instruction. The Tennessee State Standards provide a common set of expectations for what students will know and be able to do at the end of a grade. The State of Tennessee provides two sets of standards, which include the Standards for Mathematical Content and The Standards for Mathematical Practice. The Content Standards set high expectations for all students to ensure that Tennessee graduates are prepared to meet the rigorous demands of mathematical understanding for college and career. The eight Standards for Mathematical Practice describe the varieties of expertise, habits of mind, and productive dispositions that educators seek to develop in all students. The Tennessee State Standards also represent three fundamental shifts in mathematics instruction: **focus, coherence and rigor**.

Throughout this curriculum map, you will see resources as well as links to tasks that will support you in ensuring that students are able to reach the demands of the standards in your classroom. In addition to the resources embedded in the map, there are some high-leverage resources around the content standards and mathematical practice standards that teachers should consistently access. For a full description of each, click on the links below.

Tennessee Mathematics Content Standards

Standards for Mathematical Practice

Literacy Skills for Mathematical Proficency

■ Major Content ➢ Supporting Content ★(star) Modeling Standard/Domain

How to Use the Maps

Overview
An overview is provided for each quarter and includes the topics, focus standards, intended rigor of the standards and foundational skills needed for success of those standards.

Your curriculum map contains four columns that each highlight specific instructional components. Use the details below as a guide for information included in each column.

Tennessee State Standards
TN State Standards are located in the left column. Each content standard is identified as Major Content or Supporting Content. A key can be found at the bottom of the map.

Content
This section contains learning objectives based upon the TN State Standards. Best practices tell us that clearly communicating measurable objectives lead to greater student understanding. Additionally, essential questions are provided to guide student exploration and inquiry.

Instructional Support & Resources
District and web-based resources have been provided in the Instructional Support column. You will find a variety of instructional resources that align with the content standards. The additional resources provided should be used as needed for content support and scaffolding. The inclusion of vocabulary serves as a resource for teacher planning and for building a common language across K-12 mathematics. One of the goals for Tennessee State Standards is to create a common language, and the expectation is that teachers will embed this language throughout their daily lessons.

Instructional Calendar
As a support to teachers and leaders, an instructional calendar is provided ***as a guide***. Teachers should use this calendar for effective planning and pacing, and leaders should use this calendar to provide *support* for teachers. Due to variances in class schedules and differentiated support that may be needed for students' adjustment to the calendar may be required.

Topics Addressed in Quarter

- **Tools of Geometry**
- **Reasoning & Proof**
- **Lines & Angles**
- **Triangle Congruence with Applications**
- **Properties of Triangles**

Overview

Rotations, reflections, translations and congruency are developed experimentally in grade 8, and this experience is built upon in geometry, giving greater attention to precise definitions and formal reasoning. Properties of lines and angles, triangles and parallelograms were investigated in Grades 7 and 8. In geometry, these properties are revisited in a more formal setting, giving greater attention to precise statements of theorems and establishing these theorems by means of formal reasoning. During quarter one students will study Congruence (G-CO), prove geometric theorems, and make geometric constructions with a variety of tools. They will determine if two triangles are congruent by SSS, SAS, ASA, AAS, or HL and then provide appropriate reasoning for why they are congruent. Students will classify triangles based on its' angles and side measures. Students also identify relationships between parallel and perpendicular lines, use algebra to determine slopes of parallel and perpendicular lines, and write and solve equations of parallel and perpendicular lines. Additionally, in this quarter, students will use coordinates to prove simple geometric theorems algebraically (G-GPE).

Content Standard	Type of Rigor	Foundational Standards
G-CO.A.1	Conceptual Understanding	Introductory
G-CO.A.2	Conceptual Understanding	8.G.A.1, 2,3, 4
G-CO.B.7	Conceptual Understanding	8.G.A.2
G-CO.B.8	Conceptual Understanding	8.G.A.2
G-CO.C.9	Procedural Fluency, Conceptual Understanding	7.G.B.5, 8.G.A.5
G-CO.C.10	Procedural Fluency, Conceptual Understanding & Application	7.G.A.2, 8.G.A.5
G-CO.D.12	Procedural Fluency	7.G.A.2
G-GPE.B.2	Procedural Fluency & Conceptual Understanding	8.G.B.8
G-GPE.B.3	Procedural Fluency, Conceptual Understanding & Application	8.EE.B.6, 8.F.A.3
G-GPE.B.5	Procedural Fluency, Conceptual Understanding & Application	
Indicates 2017-2018 Power Standard		
Instructional Focus Documents-Geometry		

■ Major Content ➢ Supporting Content ★(star) Modeling Standard/Domain

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
Tools of Geometry **(Allow approximately 2 weeks for instruction, review, and assessment)**			
Domain: Congruence (G.CO) **Cluster**: Experiment with transformations in the plane ➢ **G.CO.A.1** Know precise definitions of angle, circle, perpendicular line, **parallel line**, and line segment, **based on the undefined notions of point, line**, distance along a line, and distance around a circular arc. **Domain**: Congruence **Cluster**: Make geometric constructions ➢ **G.CO.D.12** Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	**Essential Question(s)** In what ways can congruence be useful? **Objective(s):** • Students will explore and know precise definitions of basic geometric terms. • Students will identify the undefined notions used in geometry (point, line, plane, distance). **Type(s) of Rigor:** G.CO.A.1 - Conceptual Understanding G.CO.D.12 - Procedural Fluency	***Textbook Lessons*** Lesson 1-1 Points, Lines and Planes, pp. 5 – 13 Lesson 3-1 – Parallel Lines and planes, skew lines (definitions only), pp. 171 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Task(s)** Illustrative Mathematics Defining Parallel and Perpendicular Lines Task **Additional Resource(s)** **HS Flip Book with examples of each Standard** Points, Lines, and Planes (Interactive Notebook/Foldables) **Instructional Videos (via eMATHinstruction)** **Unit 1 - Essential Geometric Tools and Concepts**	**Vocabulary** Undefined term, point, line, plane, collinear, coplanar, intersection, definition, defined term, space Include Vocabulary from 3.1 - parallel lines, skew lines, parallel planes **Writing in Math** Connect the words *collinear* and *coplanar* to the prefix *co-*. Is it possible for two points on the surface of a prism to be neither collinear nor coplanar? Justify your answer. **Example Question: 1, 2**
Domain: Congruence **Cluster**: Experiment with transformations in the plane ➢ **G.CO.A.1** Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	**Essential Question(s)** Why are geometry and measurement important in the real world? **Objective(s):** • Students will use a straightedge to draw a segment and use a ruler to measure it. • Students will use the segment addition postulate to find the length	***Textbook Lessons*** Lesson 1-2 – Linear Measure and Precision, pp. 14 – 24 **Instructional Videos (via eMATHinstruction)** **Unit 1 - Essential Geometric Tools and Concepts**	**Vocabulary** Line segment, betweenness of points, between, congruent segments **Discussion** Discuss the *Ruler Postulate*. **Writing in Math** Why is it important to have a standard of

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
	of a segment and to identify congruent segments. **Type(s) of Rigor:** G.CO.A.1 Conceptual Understanding		measure? Refer to p. 14, and include an advantage and disadvantage to the builders of the pyramids. **Example Question:** 3
Domain: Congruence (G.CO) **Cluster**: Experiment with transformations in the plane. ➢ **G.CO.A.1** Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. **Domain**: Expressing Geometric Properties with Equations (G.GPE) **Cluster:** Use coordinates to prove simple geometric theorems algebraically. ■ **G. GPE.B.2** Use coordinates to prove simple geometric theorems algebraically.	**Essential Question(s)** Why are the Distance and Midpoint Formulas important in the real world? **Objective(s):** • Students will connect two points on a coordinate plane to form a segment and use the Distance Formula to find its length. • Students will find the midpoint of a segment and in the coordinate plane. **Type(s) of Rigor:** G.CO.A.1 - Conceptual Understanding G.GPE.B.2 - Procedural Fluency & Conceptual Understanding	***Textbook Lessons*** Lesson 1-3 – Distance and Midpoint, pp. 25 – 35 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Task(s)** TN Task Arc, Geometry - Investigating Coordinate Geometry and Its Use in Solving Mathematical Problems Task 1- *My Point is That There Are Many Points!* Task 2 - *The Distance Between Us* Task 3 - *Will That Work for ANY Two Points?* **Instructional Videos (via eMATHinstruction)** **Unit 1 - Essential Geometric Tools and Concepts** **Unit 5 - Distance and Midpoint Formulas (lessons 7 and 8)**	**Vocabulary** Distance, irrational number, midpoint, segment bisector **Writing in Math** Compare the Distance and Midpoint Formulas. Draw an example of each on a grid. **Example Question: 4, 5**
Domain: Congruence (G.CO) **Cluster**: Experiment with transformations in the plane. ➢ **G.CO.A.1** Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and	**Essential Question(s):** How are number operations used to find and compare the measures of angles. **Objective(s):** • Students will describe the characteristics, and identify angles, rays,	***Textbook Lessons*** Lesson 1-4 – Angle Measure, pp. 36 – 45 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.***	**Vocabulary** Ray, angle, vertex, degree, right angle, acute angle, obtuse angle, angle bisector **Writing in Math** Explain the prefix *bi-* when discussing *segment bisector*.

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
distance around a circular arc.	line segments, and angle bisectors. • Students will find the measure of angles using the angle addition postulate. **Type(s) of Rigor:** G.CO.A.1 - Conceptual Understanding	**Task(s)** Select appropriate tasks from GSE Analytic Geometry Unit 1: Similarity, Congruence and Proofs Illustrative Mathematics Angle Bisection and Midpoints of Line Segment Task Illustrative Mathematics Bisecting an Angle Task **Instructional Videos (via eMATHinstruction)** **Unit 1 - Essential Geometric Tools and Concepts**	Connect the word *degree* to the idea of measurement. Discuss the similarity between the *Protractor Postulate* and the *Ruler Postulate*. **Example Question:** 6
Domain: Congruence (G.CO) **Cluster**: Experiment with transformations in the plane. ➢ **G.CO.A.1** Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	**Essential Question(s)** What are some real-life applications of congruence? **Objective(s):** • Students will identify and use special pairs of angles to find measures of angles. • Students will identify perpendicular lines. **Type(s) of Rigor:** G.CO.A.1 - Conceptual Understanding	***Textbook Lessons*** Lesson 1-5 – Angle Relationships, pp. 46 – 55 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Task(s)** Select appropriate tasks from GSE Analytic Geometry Unit 1: Similarity, Congruence and Proofs **Instructional Videos (via eMATHinstruction)** **Unit 1 - Essential Geometric Tools and Concepts**	**Vocabulary** Adjacent angles, linear pair, vertical angles, complementary angles, supplementary angles, perpendicular **Writing in Math** Discuss the similarity between the postulates for angles and the postulates for segments. Describe three different ways you can determine that an angle is a right angle. *See the Teacher version of the Engage^{ny} lesson that has a thorough graphic organizer of previously learned angle facts.* **Example Question: 7A, 8, 9**

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
Domain: Expressing Geometric Properties with Equations (G.GPE) **Cluster**: Use coordinates to prove simple geometric theorems algebraically **G.GPE.B.5** Know and use coordinates to compute perimeters of polygons and areas of triangles and rectangles.	***Essential Question(s)*** What are polygons? ***Objective(s):*** • Students will identify and name polygons • Students will find perimeter, circumference, and area of two-dimensional figures ***Type(s) of Rigor:*** G.GPE.B.5 – Procedural Fluency & Conceptual Understanding	***Textbook Lesson*** Lesson 1-6 Two-Dimensional Figures Instructional Videos (emMathinstruction) Unit 10 – Lesson 1 – Perimeter Unit 10 – Lesson 2 – The Circumference of a circle. Unit 10 – Lesson 3 – The Area of Polygons Unit 10 – Lesson 4 – The Area of a Circle	***Vocabulary*** Parallelogram, vertex of a polygon, concave, convex, n-gon, equilateral polygon, regular polygon, equiangular polygon, regular polygon, perimeter, circumference, area ***TNReady Practice Problems*** Example Question 45, 46, 47
Constructions **(Allow approximately 3-4 days for instruction, review, and assessment)**			
Domain: Congruence (G.CO) **Cluster**: Experiment with transformations in the plane. ➢ **G.CO.A.1** Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. **Domain**: Congruence (G.CO) **Cluster**: Make geometric constructions. ➢ **G.CO.D.12** Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	**Essential Question(s)** Why are geometry and measurement important in the real world? **Objective(s):** • Students will identify the tools used in formal constructions. • Students will use tools and methods to precisely copy a segment, copy an angle, bisect a segment, bisect an angle, and bisect a segment. • Students will use tools and methods to precisely construct parallel lines, perpendicular lines, perpendicular bisector, and an equilateral triangle. • Students will informally perform the constructions listed above using string, reflective devices, paper folding, and/or dynamic geometric software. • Students will identify the tools used in formal constructions.	***Textbook Lessons*** Explore the different types of constructions using the vocabulary from chapter 1. Construct a copy of a Line Segment p.17 Construct a Copy of an Angle p. 39 Construct a segment bisector. Construct an Angle Bisector p. 40, Construct Parallel Lines p.205 Construct Perpendicular Lines Construct a Perpendicular Bisector p. 55 **Eureka Math Lessons** Eureka Math Geometry Module 1, Topic A, Lessons 1 & 2 – Construct an Equilateral Triangle ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.***	**Vocabulary** Line segment, betweenness of points, between, congruent segments, construction **Example Question: 7B, 10**

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
	Type(s) of Rigor: G.CO.A.1 - Conceptual Understanding G.CO.D.12 - Procedural Fluency	**Eureka Math** Eureka Math Geometry Module 1, Topic A, Lesson 3 – Copy and Bisect an Angle Eureka Math Geometry Module 1, Topic B, Lesson 6 – Solve for Unknown Angles – Angles and Lines at a Point **Instructional Videos** via eMATHinstruction) Unit 3 - Constructions (lessons 2 and 5)	
Reasoning and Proof **(Allow approximately 1.5 weeks for instruction, review, and assessment)**			
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems. ■ **G.CO.C.9** Prove theorems about lines and angles.	**Essential Question(s)** How do you use inductive reasoning to make a conjecture? **Objective(s):** • Students will make conjectures based on inductive reasoning. • Students will find counterexamples. **Type(s) of Rigor:** G.CO.B.9 - Procedural Fluency, Conceptual Understanding	***Textbook Lesson*** Lesson 2-1 – Inductive Reasoning and Conjecture, pp. 89 – 96 **Additional Resource(s)** HS Flip Book with examples of each Standard **Instructional Videos** Inductive Reasoning (via TeacherTube)	**Vocabulary** Inductive reasoning, conjecture, counterexample **Writing in Math** Consider the conjecture: *If two points are equidistant from a third point, then the three points are collinear*. Is this conjecture *true* or *false*? If false, give a counterexample.
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems. ■ **G.CO.C.9** Prove theorems about lines and angles.	**Essential Question(s)** How can theorems help prove figures congruent? **Objective(s):** • Students will analyze statements in if-then form. • Students will write	***Textbook Lessons*** Lesson 2-3 – Conditional Statements, pp. 105 – 113 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** Lesson 2.3 Extension – Geometry Lab: Biconditional Statements p.	**Vocabulary** Conditional statement, if-then statement, hypothesis, conclusion, related conditionals, converse, inverse, contrapositive, logically equivalent **Writing in Math** Describe a relationship between a

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
	converses, inverses, and contrapositives. • Students will write biconditional statements. **Type(s) of Rigor:** G.CO.B.9 - Procedural Fluency, Conceptual Understanding	114 **Instructional Videos** Conditional Statements (via TeacherTube) Converses, Inverses, and Contrapositives (via TeacherTube)	conditional, its converse, its inverse, and its contrapositive.
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems. ■ **G.CO.C.9** Prove theorems about lines and angles.	**Essential Question(s)** How can information, definitions, postulate, properties and theorems helpful in writing proofs? **Objective(s):** • Students will use algebra to write two – column proofs. • Students will use properties of equality to write geometric proofs. **Type(s) of Rigor:** G.CO.B.9 - Procedural Fluency, Conceptual Understanding	***Textbook Lesson*** Lesson 2-6 – Algebraic Proof, pp. 134-141 **Instructional Videos** Algebraic Proofs (via TeacherTube)	**Vocabulary** Algebraic proof, two-column proof, formal proof **Writing in Math** Compare and contrast informal or paragraph proofs with formal or two-column proofs. Which type of proof do you find easier to write? Justify your answer. **Example Question:** 11, 12, 13, 14
Lines, Angles and Triangles' Lines and Angles **(Allow approximately 2 weeks for instruction, review, and assessment)**			
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems ■ **G-CO.C.9** Prove theorems about lines and angles.	**Essential Question(s)** How can you identify relationships between two lines or two planes? **Objective(s):** • Students will identify the relationships between two lines. • Students will name angle pairs formed by parallel lines and	***Textbook Lesson*** Lesson 3-1 – Parallel Lines and Transversals, pp. 171 – 176 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Task(s)** Parallel Lines and Transversals	**Vocabulary** Parallel lines, skew lines, parallel planes, transversal, interior angles, exterior angles, consecutive interior angles, alternate interior angles, alternate exterior angles, corresponding angles **Writing in Math**

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
	transversals. **Type(s) of Rigor:** G.CO.B.9 - Procedural Fluency, Conceptual Understanding	(Interactive Notebook/Foldables) Select appropriate tasks from GSE Analytic Geometry Unit 1: Similarity, Congruence and Proofs **Instructional Videos (eMATHinstruction)** Unit 3 - Parallel Lines (Lessons 6 and 7)	Determine what the term *alternate* means and demonstrate it using a series of figures.
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems. ■ **G.CO.C.9** Prove theorems about lines and angles.	**Essential Question(s)** How are the angles formed by two parallel lines cut by a transversal related? **Objective(s):** • Students will use theorems to determine the relationship [s between specific pairs of angels. • Students will use algebra to find angle measurements. **Type(s) of Rigor:** G.CO.B.9 - Procedural Fluency, Conceptual Understanding	***Textbook Lesson*** Lesson 3-2 – Angles and Parallel Lines, pp. 178 - 184 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Textbook Lesson** Lesson 3-2 Explore – Geometry Software Lab: Angles and Parallel Lines p. 177 **Eureka Math** Eureka Math Geometry Module 1, Topic B, Lesson 7 -Unknown Angles-Transversals **Task(s)** Illustrative Mathematics Congruent Angles Made by Parallel Lines and a Transverse Task TN Task Arc, Geometry- Proving Theorems	**Example Question: 15A**

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
		Task 3 -Alternate Interior Angles **Instructional Videos (eMATHinstruction)** Unit 3 - Parallel Lines (Lessons 6 and 7)	
Domain: Expressing Geometric Properties with Equations (G.GPE) **Cluster:** Use coordinates to prove simple geometric theorems algebraically. ■ **G. GPE.B.3** Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems.	**Essential Question(s)** How can algebra be useful when expressing geometric properties? **Objective(s):** • Students will find slopes of lines and use the slope of a line to identify parallel and perpendicular lines. **Type(s) of Rigor:** G.GPE.B.3 - Procedural Fluency, Conceptual Understanding & Application	***Textbook Lesson*** Lesson 3-3 – Slopes of Lines, pp. 186 – 194 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Task(s)** Illustrative Mathematics Slope Criterion for Perpendicular Lines Task **Instructional Videos (via eMATHinstruction)** Unit 5 - Slopes of Lines (lesson 1)	**Vocabulary** Slope, rate of change **Writing in Math** A classmate says that all lines have positive or negative slope. Write a question that would challenge her conjecture. **Example Question:** 16 (this unit is important when working with quadrilaterals later and identifying what type of quadrilateral it is based off the relationships of the sides)
Domain: Expressing Geometric Properties with Equations (G.GPE) **Cluster:** Use coordinates to prove simple geometric theorems algebraically. ■ **G.GPE.B.3** Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	**Essential Question(s)** How can algebra be useful when expressing geometric properties? **Objective(s):** • Students will write an equation of a line given information about the graph. • Students will solve problems by writing equations.	***Textbook Lessons*** Lesson 3-4 – Equations of Lines, pp. 196 – 203 Lesson 3.4 Extension – Geometry Lab: Equations of Perpendicular Bisectors p. 204 **Instructional Videos (via eMATHinstruction)** Unit 5 - Equations of Lines (lessons 3 and 4)	**Vocabulary** Slope-intercept form, point-slope form **Writing in Math** Create a graphic organizer that shows how some of the properties, postulates and theorems build upon one another. **Example Question: 17**

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
	Types of Rigor G.GPE.B.3 - Procedural Fluency, Conceptual Understanding & Application		
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems. ■ **G.CO.C.9** Prove theorems about lines and angles.	**Essential Question(s)** How can coordinates and the coordinate plane be used to prove theorems algebraically? **Objective(s):** • Students will determine if lines are parallel using their slopes. • Students will recognize angle pairs that occur with parallel lines. • Students will prove that two lines are parallel **Type(s) of Rigor:** G.CO.B.9 - Procedural Fluency, Conceptual Understanding	Lesson 3-5 – Proving Lines Parallel, pp. 205 - 212 Constructing Parallel Lines Constructing Perpendicular Lines and Perpendicular Bisectors p. 55 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Task(s)** Select appropriate tasks from GSE Analytic Geometry Unit 1: Similarity, Congruence and Proofs **Instructional Videos (via eMATHinstruction)** **Unit 5 - Equations of Lines (lessons 3 and 4)** **Instructional Videos (via eMATHinstruction)** **Unit 4 - Constructions (lesson 3)**	**Writing in Math** Write and solve a problem involving finding the equation of a line that is parallel to a given line. **Example Question:** (this unit is important when working with quadrilaterals later and identifying what type of quadrilateral it is based off the relationships of the sides)
Properties of Triangles and Triangle Congruence with Applications **(Allow approximately 2.5 weeks for instruction, review, and assessment)**			
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems ■ **G-CO.C.10** Prove theorems about triangles. **Domain:** Congruence **Cluster**: Make geometric constructions	**Essential Question(s)** How do the properties of triangles contribute to the geometric understanding of the world around us? **Objective(s):**	***Textbook Lesson*** Lesson 4-1 Classifying Triangles, pp.235-242 **Instructional Videos** **Classifying Triangles (via TeacherTube)**	**Vocabulary** acute triangle, equiangular triangle, obtuse triangle, right triangle, equilateral triangle isosceles triangle, scalene triangle **Activity with Discussion**

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➢ **G-CO.D.12** Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	• Students will identify and classify triangles by angle measure • Students will identify and classify triangles by side measure **Type(s) of Rigor:** G.CO.C.10 - Procedural Fluency, Conceptual Understanding G.CO.D.12 Procedural Fluency		Pair the categories of classifications of sides of triangles with the categories of classifications of angles to determine which combinations can exist and which ones cannot exist. Explain why certain combinations cannot exist. (Example, can a right equilateral triangle exist?) **Error Analysis** pg. 241, #56 (H.O.T. Problem)
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems ■ **G-CO.C.10** Prove theorems about triangles. **Domain:** Congruence **Cluster**: Make geometric constructions ➢ **G-CO.D.12** Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	**Essential Question(s)** What can you say about the interior and exterior angles of a triangle and other polygons? **Objective(s):** • Students will apply the Triangle Angle Sum Theorem • Students will prove the measures of interior angles of a triangle have a sum of 180º. **Type(s) of Rigor:** G.CO.C.10 - Procedural Fluency, Conceptual Understanding G.CO.D.12 Procedural Fluency	***Textbook Lesson*** Lesson 4-2 Angles of Triangles, pp. 243-252 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Task(s)** Geometry Lab: Angles of Triangles p. 243 **Instructional Videos** Triangle Angle Sum Theorem (via TeacherTube)	**Vocabulary** Auxiliary line, exterior angle, remote interior angles, flow proof, corollary **Writing in Math** Explain in words how to find the measure of a missing angle of a triangle if you know two of the angles. (Have students write this as if they were explaining it to someone who has never taken geometry before.) Example Questions: 18
Domain: Congruence (G.CO) **Cluster**: Understand congruence in terms of rigid motion ■ **G.CO.B.7** Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if	**Essential Question(s)** How do you identify corresponding parts of congruent triangles? How do you show that two triangles are congruent?	***Textbook Lesson*** Lesson 4-3 – Congruent Triangles, pp. 253 – 261 ***Optional: Use the following resources to ensure that the intended outcome and level of***	**Vocabulary** Congruent, congruent polygons, corresponding parts **Writing in Math**

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	**Objective(s):** • Students will identify corresponding sides and corresponding triangles of congruent triangles. • Students will explain that in a pair of congruent triangles, corresponding sides are congruent (distance is preserved) and corresponding angles are congruent (angle measure is preserved). **Type(s) of Rigor:** G.CO.B.7 - Conceptual Understanding	***rigor of the standards are met.*** **Task(s)** Illustrative Mathematics Properties of Congruent Triangles Task **Instructional Videos (via eMATHinstruction)** **Unit 3 - Congruent Triangles (lesson 4)**	Determine whether the following statement is *always*, *sometimes*, or *never* true. Explain your reasoning. *Equilateral triangles are congruent.* **Example Question:** 19, 20
Domain: Similarity, Right Triangles, and Trigonometry (G.SRT) **Cluster**: Prove theorems involving similarity ■ **G-SRT.B.5** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. **Domain:** Congruence (G.CO) **Cluster**: Understand congruence in terms of rigid motions ■ **G-CO.B.7** Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. **Domain:** Congruence (G.CO) **Cluster**: Understand congruence in terms of rigid motions	**Essential Question(s)** What does the SAS Triangle Congruence Theorem tell you about triangles? What does the SSS Triangle Congruence Theorem tell you about triangles? **Objective(s):** • Students will use the SSS Postulate to test for triangle congruence. • Students will use the SAS Postulate to test for triangle congruence. • Students will write two-column proofs to show that two triangles are congruent by SSS or SAS. **Type(s) of Rigor:** G.SRT.B.5 - Procedural Fluency, Conceptual Understanding & Application G.CO.B.7 - Conceptual Understanding G.CO.B.8 - Conceptual Understanding	***Textbook Lessons*** Lesson 4-4 Proving Triangles Congruent – SSS, SAS, pp. 262-271 Lesson 4-4 Extension – Geometry Lab: Proving Constructions p. 271 ***Eureka Math*** Eureka Math: Geometry Module 1, Topic D, Lesson 22 – Congruence Criteria for Triangles-SAS ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Task(s)** Select appropriate tasks from GSE Analytic Geometry Unit 1: Similarity, Congruence and Proofs Investigating Congruence in Terms of Rigid Motion (TN Task Arc)	**Vocabulary** Included angle **Writing in Math** Create a chart for triangle congruence theorems (theorem, definition, and picture) highlighting the sides and angles that are congruent in each pair of triangles. Compare and contrast the theorems in your own words. Be sure to include both similarities and differences between the theorems. p. 269 #30, (H.O.T. Problems)

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
■ **G-CO.B.8** Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.		**Instructional Videos (via eMATHinstruction)** Unit 3 - Congruent Triangles (lesson 3)	
Domain: Similarity, Right Triangles, and Trigonometry (G.SRT) **Cluster**: Prove theorems involving similarity ■ **G-SRT.B.5** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. **Domain:** Congruence (G.CO) **Cluster**: Understand congruence in terms of rigid motions ■ **G-CO.B.7** Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. **Domain:** Congruence (G.CO) **Cluster**: Understand congruence in terms of rigid motions ■ **G-CO.B.8** Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	**Essential Question(s)** What does the ASA Triangle Congruence Theorem tell you about triangles? What does the AAS Triangle Congruence Theorem tell you about triangles? What does the HL Triangle Congruence Theorem tell you about two triangles? **Objective(s):** • Students will use the ASA Postulate to test for triangle congruence. • Students will use the AAS Postulate to test for triangle congruence. • Students will explore congruence in right triangles. • Students will write formal proofs to show that two triangles are congruent by AAS or ASA. **Type(s) of Rigor:** G.SRT.B.5 - Procedural Fluency, Conceptual Understanding & Application G.CO.B.7 - Conceptual Understanding G.CO.B.8 - Conceptual Understanding	***Textbook Lesson*** Lesson 4.5 Proving Triangles Congruent – ASA, AAS. Pp.273-280 ***Eureka Math*** Eureka Math: Geometry Module 1, Topic D, Lesson 24 – Congruence Criteria for Triangles – ASA and SSS Eureka Math: Geometry Module 1, Topic D, Lesson 25 – Congruence Criteria for Triangles – AAS and HL ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** Lesson 4.5 Geometry Lab: Congruence in Right Triangles p.281-282 **Task(s)** Select appropriate tasks from GSE Analytic Geometry Unit 1: Similarity, Congruence and Proofs **Instructional Videos(s) (via eMathinstruction)** Unit 3 - Triangle Proofs (lessons 4, 8, & 9)	**Vocabulary** Included side **Writing in Math** Explain why identifying two pairs of congruent angles with their included sides congruent is enough to prove that two triangles are congruent. **Example Question:** 21, 22, 23

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems ■ **G-CO.C.10** Prove theorems about triangles. **Domain:** Congruence (G.CO) **Cluster**: Make geometric constructions ➢ **G-CO.D.12** Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). **Domain:** Similarity, Right Triangles, and Trigonometry (G.SRT) **Cluster**: Prove theorems involving similarity ■ **G-SRT.B.5** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	**Essential Question(s)** What are the special relationships among angles and sides in isosceles and equilateral triangles? **Objective(s):** • Students will use properties of isosceles triangles. • Students will use properties of equilateral triangles. • Students will prove base angles of isosceles triangles are congruent. **Type(s) or Rigor:** G.CO.C.10 - Procedural Fluency, Conceptual Understanding & Application G.CO.D.12 Procedural Fluency G.SRT.B.5 - Procedural Fluency, Conceptual Understanding & Application	***Textbook Lesson*** Lesson 4.6 Isosceles and Equilateral Triangles, pp. 283-291 ***Eureka Math*** Eureka Math: Geometry Module 1, Topic D, Lesson 23 – Base Angles of Isosceles Triangles **Instructional Videos (via eMathinstruction)** Unit 3 - Triangle Proofs (lesson 8)	**Vocabulary** Pythagorean triple **Writing in Math** p. 290 #45 Challenge – proof (H.O.T. problem)
Domain: Congruence (G.CO) **Cluster**: Experiment with transformations in the plane. **G.CO.A.2** Represent transformations in the plane in multiple ways, including technology. Describe transformations as functions that take points in the plane (pre-image) as inputs and give other points (image) as outputs. Compare transformations that preserve distance and angle measure to those that do not (e.g., translation versus horizontal stretch).	**Essential Question(s)** What are rigid motions and how can they be defined? **Objective(s):** • Students will identify reflections, translations, and rotations. • Students will define rigid motions as reflections, rotations, translations, and combinations of these, all of which preserve distance and angle measure.	***Textbook Lesson*** Lesson 4.7 –Congruence Transformations, pp. 294 – 295 ***Eureka Math*** Eureka Math Geometry Module 1, Topic C, Lesson 12 – Transformations—The Next Level **Instructional Videos (via eMATHinstruction)**	**Vocabulary** Transformation, preimage, image, congruence transformation, isometry, reflection, translation, rotation **Writing in Math** Explain the prefix *pre-* when discussing *pre- image*. Explain, give an example and write the rules for the translations and nonrigid motion transformation on a

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
	• Students will define congruent figures as figures that have the same shape and size and state that a composition of rigid motions will map one congruent figure onto the other. **Type(s) or Rigor:** G.CO.A.2 - Conceptual Understanding	Unit 2: Transformations (lessons 1 and 6)	coordinate plane of a reflection, a translation, a rotation and a nonrigid motion transformation.

RESOURCE TOOLKIT		
Textbook Resources ConnectED Site - Textbook and Resources Glencoe Video Lessons	**Standards** Common Core Standards - Mathematics Common Core Standards - Mathematics Appendix A **HS Flip Book with examples of each Standard** http://www.ccsstoolbox.org/ http://insidemathematics.org/index.php/high-school-geometry http://www.livebinders.com/play/play/454480 https://www.livebinders.com/play/play?id=464831 http://www.livebinders.com/play/play?id=571735 **Tennessee Academic Standards for Mathematics** **Tennessee Assessment LiveBinder** **Achieve the Core Coherence Map**	**Videos** Math TV Videos The Teaching Channel Khan Academy Videos (Geometry) eMATHinstruction
Comprehensive Geometry Help: **Online Math Learning (Geometry)** **NCTM Illuminations**		
Tasks Edutoolbox (formerly TNCore) Tasks Inside Math Tasks Dan Meyer's Three-Act Math Tasks Illustrative Math Tasks UT Dana Center GSE Analytic Geometry Unit 1: Similarity, Congruence and Proofs	**ACT/SAT Testing** **ACT & SAT** TN ACT Information & Resources ACT College & Career Readiness Mathematics Standards SAT Connections SAT Practice from Khan Academy	**SEL Resources** SEL Connections with Math Practices **SEL Core Competencies** The Collaborative for Academic, Social, and Emotional Learning (CASEL)

August 2019						
Suggested Lessons for the Week	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Notes:**
				1	2	***Please use this suggested pacing as a guide. It is understood that teachers may be up to 1 week ahead or 1 week behind depending on their individual class needs.***
	5	6	7	8	9	
	12 *1st Quarter Begins*	13	14	15	16	
1.1-Points, Lines, and Planes 3.1 Parallel Lines and Planes 1.2-Linear Measure and Precision 1.3 Distance and Midpoint	19	20	21	22	23	
1.4-Angle Measure 1.5-Angle Relationships 1.6 Two-Dimensional Figures Explore Different Types of Constructions	26	27	28	29	30	

Use this time to establish routines, procedures, and build positive classroom culture. Additional SEL resources: SEL Connections and SEL Competencies

■ Major Content ➢ Supporting Content ★(star) Modeling Standard/Domain

September 2019						
Suggested Lessons for the Week	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Notes:**
2.1- Inductive Reasoning and Conjecture 2.3-Conditional Statements 2.3- Extension – Geometry Lab: Biconditional Statements	**2** ***Labor Day (Out)***	**3**	**4**	**5**	**6**	***Please use this suggested pacing as a guide. It is understood that teachers may be up to 1 week ahead or 1 week behind depending on their individual class needs.***
2.6-Algebraic Proofs 3.1-Parallel Lines and Transversals 3.2 Angles and Parallel Lines *(Eureka Math Module 1: Lesson 7)*	**9**	**10**	**11**	**12**	**13**	
3.3-Slopes of Lines 3.4-Equations of Lines	**16**	**17**	**18**	**19** *Parent Teacher Conferences*	**20** *½ day students*	
3.5-Proving Lines Parallel, Constructing Parallel Lines 4.1-Classifying Triangles 4.2-Angles of Triangles 4.3-Congruent Triangles	**23**	**24**	**25**	**26**	**27**	
	30	1	2	3	4	

■ Major Content ➢ Supporting Content ★(star) Modeling Standard/Domain

October 2019						
Suggested Lessons for the Week	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Notes:**
4.4-Proving Triangles Congruent (SSS/SAS) 4.4 – Extension – Geometry Lab: Proving Constructions 4.5-Proving Triangles Congruent (ASA/AAS)	30	1	2	3	4	***Please use this suggested pacing as a guide. It is understood that teachers may be up to 1 week ahead or 1 week behind depending on their individual class needs.***
4.5-Geometry Lab: Congruence in Right Triangles 4.6-Isosceles and Equilateral Triangles Remediation and Review; Assessment	7	8	9	10	11 *½ day students* *End of 1st Quarter*	
	14	15	16	17	18	
	21 *2nd Quarter Begins*	22	23	24	25	
	28	29	30	31 ***Halloween***	1	

Fall Break

■ Major Content ➢ Supporting Content ★(star) Modeling Standard/Domain