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		

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

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

- **Transformations and Congruence**
- **Transformations and Symmetry**
- **Similarity and Transformations**
- **Using Similar Triangles**
- **Properties of Quadrilaterals with Coordinate Proofs**

Overview

During the second quarter, students will develop the relationship between transformations and congruency. Students will study Congruence (G-CO), namely experimenting with transformations in the plane, understanding congruence in terms of rigid motion. They will identify similar polygons, identify similar triangles, and prove similarity using properties. Students will also use congruence and similarity criteria for triangles to solve problems and prove relationships in geometric figures. Students also will gain a deeper insight into constructing two-column, paragraph, and coordinate proofs. Students determine whether a triangle exists given three side measures and find the range of the third side when given two side measures. They will compare the sides or angles of a given triangle and apply the Hinge theorem. Students will learn how to find missing angles in triangles both interior and exterior angles. Students will also use congruence and similarity criteria for triangles to solve problems and to prove relationships (G-SRT). Identifying quadrilaterals using given properties concludes the second quarter. Students should be able to solve equations to find various missing parts of the quadrilaterals as well as write two-column, paragraph and coordinate proofs using definitions and properties.

Content Standard	Type of Rigor	Foundational Standards
G.CO.A.2	Conceptual Understanding	8.G.A.2, 8.G.A.3
G.CO.A.3	Conceptual Understanding	8.G.A.2, 8.G.A.3
G.CO.A.4	Conceptual Understanding	8.G.A.2, 8.G.A.3
G.CO.A.5	Procedural Fluency, Conceptual Understanding	8.G.A.2, 8.G.A.3
G.CO.B.6	Procedural Fluency, Conceptual Understanding	8.G.A.2
G.CO.B.7	Conceptual Understanding	8.G.A.2
G.CO.C.11	Conceptual Understanding	7.G.A.2, 8.G.A.5
G. GPE.B.2	Procedural Fluency & Conceptual Understanding	8.G.B.8
G. GPE.B.4	Procedural Fluency	8.G.B.8
G.MG.A.1	Procedural Fluency, Conceptual Understanding & Application	8.G.A.5; 8.G.B.7
G.MG.A.2	Application	8.G.A.5; 8.G.B.7
G. SRT.A.1	Conceptual Understanding	8.G.A.4
G. SRT.A.2	Conceptual Understanding	8.G.A.4
G. SRT.A.3	Conceptual Understanding	8.G.A.4
G. SRT.B.4	Procedural Fluency, Conceptual Understanding	8.G.A.1, 2,3, 4,5
G. SRT.B. 5	Procedural Fluency, Conceptual Understanding & Application	8.G.A.1, 2,3, 4,5
G. SRT.C.6	Conceptual Understanding	Introductory
Indicates 2017-2018 Power Standard		
Instructional Focus Documents-Geometry		

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
Transformations and Congruence; Transformations and Symmetry **(Allow approximately 3 weeks for instruction, review, and assessment)**			
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). ➢ **G.CO.A.4** Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. ➢ **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.	***Essential Question(s)*** How can you represent a transformation in the coordinate plane? ***Objective(s):*** • Students will construct the reflection definition by connecting any point on the pre-image to is corresponding parts on the reflected image and describe the line segment's relationship to the line of reflection (i.e., the line of reflection is the perpendicular bisector of the segment). ***Type(s) of Rigor:*** G.CO.A.2 – – Conceptual Understanding G.CO.A.4 – Conceptual Understanding G.CO.B.7 – Conceptual Understanding	***Textbook Lesson*** Lessons 9-1 –Reflections, pp. 615 – 623 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** ***Eureka Math*** Eureka Math Geometry Module 1, Topic C, Lesson 14 – Reflections ***Task(s)*** TN Task Arc, Geometry -Investigating Congruence in Terms of Rigid Motion, *Task 3 – Reflect on This (Use patty paper to differentiate for struggling learners.)* Illustrative Mathematics Defining Reflections Task ***Instructional Videos (eMATHinstruction)*** Unit 2 –Lesson 3 - Reflections	***Vocabulary*** Line of reflection ***Writing in Math*** Describe how to reflect a coordinate figure not on a plane across a line. ***TNReady Practice Problems:*** Example Questions: 1, 2, 3, 4a
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	***Essential Question(s)*** How can you represent a transformation in the coordinate plane? ***Objective(s):*** • Students will construct the translation definition by connecting any point on the pre-image to its corresponding point on the translated image, and connecting a second point on the pre-image to its corresponding point on the translated image, and describe how the two	***Textbook Lesson*** Lesson 9-2 –Translations, pp. 624 – 631 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** ***Eureka Math*** Eureka Math Geometry Module 1, Topic C, Lesson 16 – Translations ***Task(s)*** Select appropriate tasks from GSE Analytic	***Vocabulary*** Translation vector ***Writing in Math*** Compare and contrast a translation and a reflection. Describe what a vector is and how it is used to define a translation. Describe any similarities between the meaning of *translation* as it us used in geometry and the word's meaning when used to describe the

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
stretch). ➢ **G.CO.A.4** Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. ➢ **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	segments are equal in length, point in the same direction, and are parallel. ***Type(s) of Rigor:*** G.CO.A.2 - Conceptual Understanding G.CO.A.4 - Conceptual Understanding G.CO.B.7 – Conceptual Understanding	Geometry Unit 1: Similarity, Congruence and Proofs Illustrative Mathematics Identifying Translations Task ***Instructional Videos (eMATHinstruction)*** Unit 2 –Lesson 5 - Translations	process of converting words from one language to another. ***TNReady Practice Problems:*** Example Questions: 4b, 5, 11, 30, 49
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). ➢ **G.CO.A.4** Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. ➢ **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	***Essential Question(s)*** How can you represent a transformation in the coordinate plane? ***Objective(s):*** • Students will construct rotation definition by connecting the center of rotation to any point on the pre-image and to its corresponding point on the rotated image, and describe the measure of the angle formed and the equal measures of the segments that formed the angles part of the definition. ***Type(s) of Rigor:*** G.CO.A.2 - Conceptual Understanding G.CO.A.4 - Conceptual Understanding • G.CO.B.7 – Conceptual Understanding	***Textbook Lessons*** Lesson 9-3 – Rotations, pp. 632 – 638 Lesson 9-3 Explore – Geometry Lab: Rotations p. 631 ***Eureka Math*** Eureka Math Geometry Module 1, Topic C, Lesson 13 – Rotations ***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 Congruence in Terms of Rigid Motion Task 2: Twisting Triangles *(Use patty paper to differentiate for struggling learners.)* Select appropriate tasks from GSE Analytic Geometry Unit 1: Similarity, Congruence and Proofs Illustrative Mathematics Defining Rotations Task Illustrative Mathematics Identifying Rotations	***Vocabulary*** Center of rotation, angle of rotation ***Writing in Math*** Use a graphic organizer to keep track of the types of transformations and their properties in a sequence of transformations. ***TNReady Practice Problems:*** Example Questions: 4b, 6, 7, 8, 9, 10

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
		Task ***Instructional Videos (eMATHinstruction)*** Unit 2 – Lesson 2 – Rotations	
Domain: Congruence (G.CO) **Cluster**: Experiment with transformations in the plane ➢ **G.CO.A.5** Given a geometric figure and a rigid motion, draw the image of the figure in multiple ways, including technology. Specify a sequence of rigid motions that will carry a given figure onto another. ➢ **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.	***Essential Question(s)*** How can you represent a transformation in the coordinate plane**?** ***Objective(s):*** • Students will draw a specific transformation given a geometric figure and a rotation. • Students will predict and verify the sequence of transformations (a composition) that will map a figure onto another. ***Type(s) of Rigor:*** G.CO.A.5 - Procedural Fluency, Conceptual Understanding G.CO.B.7 – Conceptual Understanding	***Textbook Lesson*** Lesson 9-4 – Compositions of Transformations, pp. 641 – 649 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** Lesson 9.4 Explore – Geometry Software Lab: Compositions of Transformations, p. 640 Eureka Math Geometry Module 1, Topic C, Lesson 13 – Rotations	***Vocabulary*** Composition of transformations, glide reflection ***Writing in Math*** Explain how the Latin word for *rigid* helps to understand *nonrigid transformation*. Compare and contrast the methods learned for combining rigid transformations and nonrigid transformations in the coordinate plane. ***TNReady Pratice Problems:*** Example Questions: 12, 13, 14, 15
Domain: Congruence (G.CO) **Cluster**: Experiment with transformations in the plane ➢ **G.CO.A.3** Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	***Essential Question(s)*** How can you identify the type of symmetry that a figure has? ***Objective(s):*** • Students will identify line and rotational symmetries in two-dimensional figures. ***Type(s) of Rigor:*** G.CO.A.3 - Conceptual Understanding	***Textbook Lesson*** Lesson 9-5 – Symmetry, pp. 653 - 659 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** ***Eureka Math*** Eureka Math Geometry Module 1, Topic C, Lesson 15 – Rotations, Reflections, and Symmetry ***Instructional Videos (eMATHinstruction)*** Unit 2 – Lesson 9 – Symmetries of a Figure	***Vocabulary*** Symmetry, line symmetry, line of symmetry, rotational symmetry, center of symmetry, order of symmetry, magnitude of symmetry, plane symmetry, axis symmetry ***Writing in Math*** Connect the idea of a *reflection* to a figure with *line symmetry*. ***TNReady Practice Problems:*** Example Questions: 16, 17, 18, 19, 48

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
Domain: Congruence (G.CO) **Cluster**: Understand congruence in terms of rigid motion ■ **G.CO.B.6** Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to determine informally if they are congruent.	**Essential Question(s)** How do you define congruence in terms of rigid motion? **Objective(s):** • Students will predict the composition of transformations that will map a figure onto a congruent figure. • Students will determine if two figures are congruent by determining if rigid motions will turn one figure into the other.	**Additional Lesson(s)** Extra lesson – Congruence Transformation **Rigid Motions and Congruence Activity** (just the activity page) ***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 Congruence in Terms of Rigid Motion Task 4 -Looks Can Be Deceiving **Instructional Videos (via eMATHinstruction)** **Unit 2 – Transformations, Rigid Motion, and Congruence**	**Writing in Math** Define congruent. Relate the word to the terms *equal* and *equivalent*. **Example Question** 1, 7, 20
Domain: Congruence (G.CO) **Cluster**: Understand congruence in terms of rigid motion ■ **G.CO.B.6** Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to determine informally if they are congruent.	***Essential Question(s)*** How do you define congruence in terms of rigid motion? ***Objective(s):*** • Students will predict the composition of transformations that will map a figure onto a congruent figure. • Students will determine if two figures are congruent by determining if rigid motions will turn one figure into the other. ***Type(s) of Rigor:*** • G.CO.B.6 - Procedural Fluency, Conceptual Understanding	**Additional Lesson(s)** Extra lesson – Congruence Transformation Rigid Motions and Congruence Activity (just the activity page) ***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 Congruence in Terms of Rigid Motion Task 4 -Looks Can Be Deceiving ***Instructional Videos (eMATHinstruction)*** Unit 2 – Lesson 6 – Congruence and Rigid Motions Unit 2 – Lesson 7 – Basic Rigid Motion Proofs	***Writing in Math*** Define congruent. Relate the word to the terms *equal* and *equivalent*. ***TNReady Practice Problems:*** Example Questions: 1, 7, 20

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
		Unit 2 – Lesson 8 – Congruence Reasoning with Triangles	
Domain: Similarity, Right Triangles and Trigonometry (G.SRT) **Cluster:** Understand similarity in terms of similarity transformations. ■ **G. SRT.A.1** Verify informally the properties of dilations given by a center and a scale factor. **Domain**: Similarity, Right Triangles and Trigonometry (G.SRT) **Cluster**: Understand similarity in terms of similarity transformations ■ **G. SRT.A.2** Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. **Domain**: Similarity, Right Triangles and Trigonometry (G.SRT) **Cluster**: Define trigonometric ratios and solve problems involving right triangles **G.SRT.C.6** Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	***Essential Question(s)*** How do you show two triangles are similar? ***Objective(s):*** • Determine whether an image is an enlargement or reduction. • Construct dilations. • Construct dilations in the coordinate plane. • Verify similarity transformations. ***Type(s) of Rigor:*** G.SRT.A.1 - Conceptual Understanding G.SRT.A.2 - Conceptual Understanding G.SRT.C.6 – Conceptual Understanding	***Textbook Lesson*** Lesson 9-6 – Dilations, pp. 660 - 667 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** ***Eureka Math*** Eureka Math Geometry Module 2, Topic B Lesson 6 – Dilations as Transformations of the Plane Eureka Math Geometry Module 2, Topic B, Lesson 7 – How do Dilations Map Segments? Eureka Math Geometry Module 2, Topic C, Lesson 12 – Similarity Transformations ***Instructional Videos (eMATHinstruction)*** Unit 7 - Lesson 1 – Dilations Unit 7 – Lesson 2 – Dilations in the Coordinate Plane Unit 7 – Lesson 3 – Dilations and Angles	***Vocabulary*** dilation, similarity transformation, center of dilation, scale factor of a dilation, enlargement, reduction ***Activity with Discussion*** Explain how you can use scale factor to determine whether a transformation is an enlargement, a reduction, or a congruence transformation. ***TNReady Practice Problems:*** Example Questions: 21, 22, 23, 24, 25, 26, 27, 28, 31, 32, 33

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
Similarity and Transformations and Using Similar Triangles **(Allow approximately 3 weeks for instruction, review, and assessment)**			
Domain: Modeling with Geometry (G.MG) **Cluster**: Apply geometric concept in modeling situations ■ **G.MG.A.2** Apply geometric methods to solve real world problems.★	***Essential Question(s)*** What is the difference between a ratio and a proportion? What operations are used to solve a proportion? ***Objective(s):*** • Write ratios • Write and solve proportions ***Type(s) of Rigor:*** • G.MG.A.2 – Application	***Textbook Lesson (optional)*** ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** Lesson 7-1 Ratios and Proportions pp. 457 - 464	***Vocabulary*** Ratio, extended ratios, proportion, extremes, means, cross products ***Activity with Discussion*** Research and Report- The Fibonacci Sequence and the Golden Ratio - what are they, why are they important, and how are they related.
Domain: Similarity, Right Triangles and Trigonometry (G.SRT) **Cluster**: Understand similarity in terms of similarity transformations ■ **G. SRT.A.2** Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	***Essential Question(s)*** How do you use proportions to find side lengths in similar polygons? How do you identify corresponding parts of similar triangles? ***Objective(s):*** • Use proportions to Identify similar polygons • Solve problems using the properties of similar polygons ***Type(s) of Rigor:*** • G.SRT.A.2 - Conceptual Understanding	***Textbook Lesson*** Lesson 7-2 Similar Polygons pp.465-473 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** HS Flip Book with examples of each Standard ***Task(s)*** Illustrative Mathematics: Similar Quadrilaterals Illustrative Mathematics: Similar Triangles ***Instructional Videos (eMATHinstruction)*** Unit 7 – Lesson 4 - Similarity	***Vocabulary*** Similar polygons, similarity ratio, scale factor ***Activity with Discussion*** p. 472 #54 Draw two regular pentagons that are different sizes. Are the pentagon's similar? Will any two regular polygons with the same number of sides be similar? Explain ***Writing in Math/Discussion*** p. 472 #55 Compare and contrast congruent, similar, and equal figures. ***TNReady Practice Problems:*** Example Questions: 34, 35
Domain: Similarity, Right Triangles and Trigonometry (G.SRT) **Cluster**: Prove theorems involving similarity ■ **G. SRT.B.4** Prove theorems about triangles.	**Essential Question(s)** How do you use proportions to find side lengths in similar polygons? How do you show two triangles are similar?	***Textbook Lesson*** Lesson 7-3 Similar Triangles pp. 474-483 ***Optional: Use the following resources to ensure that the intended outcome and level***	**Writing in Math/Discussion** Contrast and compare the triangle congruence theorems with the triangle similarity theorems. **Example Question**

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
■ **G. SRT.B.5** Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures. **Domain**: Similarity, Right Triangles and Trigonometry (G.SRT) **Cluster:** Understand similarity in terms of similarity transformations. ■ **G. SRT.A.3** Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	**Objective(s):** • Identify and prove similar triangles using the AA Similarity Postulate and the SSS and SAS similarity Theorems • Use similar triangles to solve problems	***of rigor of the standards are met.*** **Eureka Math** Eureka Math Geometry Module 2, Topic C, Lesson 14 – Similarity Eureka Math Geometry Module 2, Topic C, Lesson 15 – AA Similarity Eureka Math Geometry Module 2, Topic C, Lesson 16 – Between-Figure and Within-Figure Ratios Eureka Math Geometry Module 2, Topic C, Lesson 17 – SSS & SAS Similarity **Other Resources** HS Flip Book with examples of each Standard **Instructional Videos (via eMATHinstruction)** Unit 2 – Dilations and Similarity	36, 37, 38, 39
Domain: Similarity, Right Triangles, and Trigonometry (G.SRT) **Cluster**: Prove theorems involving similarity ■ **G. SRT.B.4** Prove theorems about similar triangles. **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)*** How are the segments that join the midpoints of a triangle's sides related to the triangle's sides? How do you use proportions to find side lengths in similar polygons? ***Objective(s):*** • Students will use proportional parts within triangles. • Students will use proportional parts with parallel lines. • Students will prove the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length.	***Use the textbook resources to address procedural fluency.*** Lesson 7-4 Parallel Lines and Proportional pp. 484-493 ***Use the following Lesson(s) to introduce concepts/build conceptual understanding.*** ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** ***Task(s)*** TN Geometry Task: Midpoint Madness *See Mathematics, Instructional Resources, Geometry* TN Task Arc: How Should We Divide This *See*	***Vocabulary*** mid-segment of a triangle ***Activity with Discussion*** Use multiple representations to explore angle bisectors and proportions. See p. 492, #47 ***TNReady Practice Problems:*** Example Questions: 40, 41, 42, 43, 44

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
	• Use proportional parts within triangles • Use proportional parts with parallel lines ***Type(s) of Rigor:*** G.SRT.B.4 - Procedural Fluency & Conceptual Understanding G.SRT.B.5 – Procedural Fluency, Conceptual Understanding & Application	*Mathematics, Instructional Resources, Geometry, Task Arc: Investigating Coordinate Geometry* *See Mathematics, Instructional Resources, Geometry, Task Arc: Investigating Coordinate Geometry* Partitioning However You Want to Slice It Comparing Shapes ***Eureka Math*** Eureka Math: Geometry Module 1, Topic E, Lesson 29 – Special Lines in Triangles: Mid-segments Eureka Math Geometry Module 2, Topic B, Lesson 10 – Dividing a Line Segment into Equal Parts Eureka Math Geometry Module 2, Topic C, Lesson 19 – Families of Parallel Lines and the Circumference of the Earth ***Instructional Videos (eMATHinstruction)*** Unit 7 – Lesson 8 – The Side Splitter Theorem	
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. **Domain**: Expressing Geometric Properties with Equations (G.GPE) **Cluster:** Use coordinates to prove simple geometric theorems algebraically	***Essential Question(s)*** How is coordinate algebra used when writing geometric proofs? ***Objective(s):*** • Students will find midpoints of segments and points that divide segments into 3, 4, or more proportional, equal parts. ***Type(s) of Rigor:*** G.GPE.B.2 - Procedural Fluency & Conceptual Understanding	***Eureka Math*** Eureka Math Geometry, Module 4, Topic D, Lesson 12: Dividing Segments Proportionately ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** ***Task(s)*** Scaling a Triangle in the Coordinate Plane *Use the interactive resources to address procedural skill and fluency.*	***TNReady Practice Problems:*** Example Questions: 45, 46

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
■ **G. GPE.B.4** Find the point on a directed line segment between two given points that partitions the segment in a given ratio	• G.GPE.B.4 – Procedural Fluency	Dividing Line Segments Expressing Geometric Properties with Equations HSG-GPE.B.6 ***Instructional Videos (eMATHinstruction)*** Unit 7 – Lesson 9 – Partitioning a Line Segment	
Properties of Quadrilaterals and Coordinate Proof **(Allow approximately 3 weeks for instruction, review, and assessment)**			
Domain: Modeling with Geometry (G.MG) **Cluster**: Apply geometric concepts in modeling situations ■ **G. MG.A.1** Use geometric shapes, their measures, and their properties to describe objects .★	***Essential Question(s)*** Is there a limit to the sum of the interior/exterior angles of a polygon why or why not? ***Objective(s):*** • Students will find and use the sum of the measures of the interior angles of a polygon • Find and use the sum of the measures of the exterior angles of a polygon ***Type(s) of Rigor:*** • G.MG.A.1 - Procedural Fluency, Conceptual Understanding & Application	***Textbook Lesson*** Lesson 6-1 Angles of Polygons pp. 389-398 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** ***Task(s)*** Angle Sums Spreadsheet Lab p. 398 Illustrative Mathematics Illustrative Mathematics: Sum of Angles in a Polygon	***Vocabulary*** diagonal ***Writing in Math*** p. 396 #52 Open ended - Sketch a polygon and find the sum of its interior angles. How many sides does a polygon with twice this interior angles sum have? Justify your answer ***TNReady Practice Problems:*** Example Questions: 18, 19, 48
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems ■ **G. CO.C.11** Prove theorems about parallelograms. **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)*** What can you conclude about the sides, angles, and diagonals of a parallelogram? ***Objective(s):*** • Students will recognize and apply properties of the sides and angles of parallelograms • Students will recognize and apply properties of parallelograms ***Type(s) of Rigor:***	***Textbook Lesson*** Lesson 6-2 Parallelograms, pp. 399-408 ***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	***Vocabulary*** parallelogram ***Writing in Math*** p. 406 # 43 Open ended - Provide a counterexample to show that parallelograms are not always congruent if their corresponding sides are congruent. (H.O.T. Problem) ***TNReady Practice Problems:*** Example Question: 9

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
	G.CO.C.11 - Conceptual Understanding G.GPE.B.2 – Procedural Fluency & Conceptual Understanding	TN Task: Expanding Triangles *See Mathematics, Instructional Resources, Geometry* **Istructional Videos (eMATHinstruction)** Unit 6 – Lesson 1 – Trapezoids and Parallelograms Unit 6 - Lesson 2 – Properties of Parallelograms	
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems ■ **G. CO.C.11** Prove theorems about parallelograms. **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)*** What criteria can you use to prove that a quadrilateral is a parallelogram? ***Objective(s):*** • Students will recognize the conditions that ensure a quadrilateral is a parallelogram. • Students will prove that a set of points forms a parallelogram in the coordinate plane. ***Type(s) of Rigor:*** G.CO.C.11 - Conceptual Understanding G.GPE.B.2 – Procedural Fluency & Conceptual Understanding	***Textbook Lesson*** Lesson 6-3 Tests for Parallelograms pp.409-417 ***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 Graphing Technology Lab - Parallelograms p. 408 Whitebeard's Treasure Task Whitebeard's Treasure Task Similarity, Congruence & Proofs TN Task: Park City **Istructional Videos (eMATHinstruction)** Unit 6 – Lesson 3 – What Makes a Parallelogram	***Writing in Math*** Journal Question: Are two parallelograms congruent if they both have four congruent angles? Justify your answer
Domain: Congruence (G.CO) **Cluster**: Prove geometric theorems ■ **G. CO.C.11** Prove theorems about parallelograms.	***Essential Question(s)*** How are the properties of rectangles, rhombi, and squares used to classify quadrilaterals? How can you use given conditions to prove that a quadrilateral is a rectangle, rhombus or	***Textbook Lessons*** Lesson 6-4 Rectangles, pp 419 - 425 Lesson 6-5 Rhombi and Squares, pp 426 - 434 ***Eureka Math***	***Vocabulary*** rectangle, rhombi, and square. ***TNReady Practice Problems:*** Example Question:16

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.2** Use coordinates to prove simple geometric theorems algebraically.	square? ***Objective(s):*** • Students will recognize and use the properties of rectangles • Students will determine whether parallelograms are rectangles • Students will recognize and apply the properties of rhombi and squares. • Students will determine whether quadrilaterals are rectangles, rhombi, or squares. ***Type(s) of Rigor:*** G.CO.C.11 - Conceptual Understanding • G.GPE.B.2 – Procedural Fluency & Conceptual Understanding	Eureka Math: Geometry Module 1, Topic E, Lesson 28 – Properties of Parallelograms ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** ***Task(s)*** TN Task: Getting in Shape TN Task: Lucio's Ride ***Instructional Videos (eMATHinstruction)*** Unit 6 – Lesson 5 - Rectangles Unit 6 – Lesson 6 – The Rhombus Unit 6 – Lesson 7 - Squares	
Domain: Modeling with Geometry (G.MG) **Cluster**: Apply geometric concepts in modeling situations ■ **G. MG.A.2** Apply geometric methods to solve real-world problems ★.	***Essential Question(s)*** What are the properties of kites and trapezoids? ***Objective(s):*** • Students will apply properties of trapezoids • Students will apply properties of kites ***Type(s) of Rigor:*** • G.MG.A.2 – Application	***Textbook Lesson*** Lesson 6-6 Trapezoids and Kites, pp.435-446 ***Eureka Math*** Eureka Math: Geometry Module 1, Topic D, Lesson 33 – Review of the Assumptions 1 Eureka Math: Geometry Module 1, Topic D, Lesson 34– Review of the Assumptions 2 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** ***Task(s)*** Properties of Different Quadrilaterals ***Instructional Videos (eMATHinstruction)*** Unit 6 – Lesson 1 – Trapezoids and Parallelograms	***Vocabulary*** trapezoid, bases, legs of a trapezoid, base angles, isosceles trapezoid, midsegment of a trapezoid ***Graphic Organizer*** Use a Venn Diagram to show the relationship of the quadrilaterals you studied in Chapter 6 ***TNReady Practice Problems:*** Example Questions: 2, 17

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)

October 2019						
Suggested Lessons for the Week	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Notes:**
	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.***
	7	**8**	**9**	10	11 ***½ day students*** ***End of 1st Quarter***	
	14	**15**	**16**	**17**	**18**	
9.1-Reflections 9.2-Translations	21 *2nd Quarter Begins*	**22**	**23**	**24**	**25**	
9.3-Rotations 9.4-Compositions of Transformations	**28**	**29**	**30**	31 *Halloween*	1	

Fall Break

November 2019						
Suggested Lessons for the Week	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Notes:**
9.5-Symmetry					**1**	***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.***
Additional Lesson: Congruence Transformations 9.6-Dialations	**4**	**5**	**6**	**7**	**8** ***1/2 day students***	
7.1-Ratios and Proportions 7.2- Similar Polygons	**11** ***Veteran's Day (Out)***	**12**	**13**	**14**	**15**	
7.3-Similar Triangles 7.4-Parallel Lines &Proportional Parts Eureka M4:L12	**18**	**29**	**20**	**21**	**22**	
	25 PD FLEX DAYS	**26**	**27** Thanksgiving Break	**28**	**29**	

December 2019						
Suggested Lessons for the Week	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Notes:**
6.1-Angles and Polygons 6.2-Parallelograms 6.3-Tests for Parallelograms	**2**	**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.***
6.4-Rectangles 6.5-Rombi & Squares 6.6-Trapezoids & Kites	**9**	**10**	**11**	**12**	**13**	
Assessment, Remediation, and/or Further Application	**16**	**17**	**18**	**19**	**20** ***½ day students*** ***End of 2nd Quarter***	
Winter Break	**23**	**24**	**25**	**26**	**27**	
Winter Break	**30**	**31**	1	2	3	