Mathematics
Geometry: Year at a Glance
2018 - 2019

Q1	Q2	Q3	Q4
Aug. 6 – Oct. 5	Oct. 16 - Dec. 19	Jan. 7 – Mar. 8	Mar. 18 – May 24 TN Ready Testing Apr. 22 – May 3
Tools of Geometry, Reasoning and Proof, Transformations and Congruence, Transformations and Symmetry, Lines and Angles	Triangle Congruence with Applications, Properties of Triangles, Special Segments in Triangles, Properties of Quadrilaterals with Coordinate Proofs	Similarity and Transformations, Using Similar 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.B.7	G.CO.A.1	G.CO.D.12
G.CO.A.2	G.CO.B.8	G. SRT.A.1	G.C.A.2
G.CO.A.3	G.CO.C.10	G. SRT.A.2	G.C.A.3
G.CO.A.4	G.CO.C.11	G. SRT.A.3	G.C.B.4
G.CO.A.5	G.CO.D.12	G. SRT.B.4	G. GPE.A.1
G.CO.B.6	G. SRT.B.4	G. SRT.B.5	G. GPE.B.2
G.CO.B.7	G. SRT.B.5	G. SRT.C.6	G. GPE.B.3
G.CO.C.9	G. GPE.B.2	G. SRT.C.7	G. GPE.B.4

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G.CO.D.12	G. GPE.B.5	G. SRT.C.8	G.MG.A.1
G. GPE.B.2	G.MG.A.1	G. MG.A.2	G. MG.A.2
G. GPE.B.3	G.MG.A.2	G. GMD.A.1	G. GMD.A.1
		G.C.A.1	G. GMD.A.2
		G.C.A.2	

Key:

Major Content	Supporting Content

*** (asterisk) Indicates a standard with differences between the TN State Standards' numbering and/or verbiage and the standards in Eureka**

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**.

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The **Standards for Mathematical Practice** describe varieties of expertise, habits of minds and productive dispositions that mathematics educators at all levels should seek to develop in their students. These practices rest on important National Council of Teachers of Mathematics (NCTM) "processes and proficiencies" with

longstanding importance in mathematics education. Throughout the year, students should continue to develop proficiency with the eight Standards for Mathematical Practice. The following are the eight Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of them.
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.

This curriculum map is designed to help teachers make effective decisions about what mathematical content to teach so that ultimately our students can reach Destination 2025. 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

Structure of the Standards

Structure of the TN State Standards include:

- **Content Standards** - Statements of what a student should know, understand, and be able to do.

- **Clusters** - Groups of related standards. Cluster headings may be considered as the big idea(s) that the group of standards they represent are addressing. They are therefore useful as a quick summary of the progression of ideas that the standards in a domain are covering and can help teachers to determine the focus of the standards they are teaching.

- **Domains** - A large category of mathematics that the clusters and their respective content standards delineate and address. For example, Number and Operations – Fractions is a domain under which there are a number of clusters (the big ideas that will be addressed) along with their respective content standards, which give the specifics of what the student should know, understand, and be able to do when working with fractions.

- **Conceptual Categories** – The content standards, clusters, and domains in the 9th-12th grades are further organized under conceptual categories. These are very broad categories of mathematical thought and lend themselves to the organization of high school course work. For example, Algebra is a conceptual category in the high school standards under which are domains such as Seeing Structure in Expressions, Creating Equations, Arithmetic with Polynomials and Rational Expressions, etc.

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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

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.

Vocabulary and Fluency

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. In order to aid your planning, we have also included a list of fluency activities for each lesson. It is expected that fluency practice will be a part of your daily instruction. (Note: Fluency practice is not intended to be speed drills, but rather an intentional sequence to support student automaticity. Conceptual understanding must underpin the work of fluency.

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.

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Topics Addressed in Quarter

- **Properties of Angles and Segments in Circles**
- **Arc Length, Sector Area, and Equations of Circles**
- **Use Coordinates to Prove Simple Geometric Theorems Algebraically**
- **Volume of Solids**
- **Visualizing Solids**
- **Trigonometry with All Triangles**

Overview

During the fourth quarter students continue their study of circles. They explore and apply the properties of angles and segments in circles including the intersection of two secants, two tangents, two chords or a secant and a tangent. Then they find and apply arc length and area of sectors and write equations of circles and graph them in the coordinate plane. Students use coordinates to prove simple geometric theorems algebraically and then students explain volume formulas and use them to solve problems in prisms, pyramids, cylinders, cones and spheres. Students learn how to construct regular hexagons, squares, and triangles in circles. At this point, students have covered most of the content & standards needed prior to the TNReady End of Course Exam. Since there are 3 to 4 weeks of class after the EOC exam, students will examine some additional content/standards. Students will then spend some time reviewing and extending their understanding of surface area of solids. The year will conclude by studying law of sines and cosines to find missing sides in any triangle, not just right triangles.

Year at a Glance Document

Content Standard	Type of Rigor	Foundational Standards
G-GPE.B.4	Conceptual Understanding	A-REI.B.4
G-MG.A.1	Conceptual Understanding & Application	8.G.A.1, 2,3, 4,5
G-MG.A.3	Application	8.G.A.5; 8.G.B.7
G-CO.D.12	Procedural skill & fluency, Conceptual Understanding & Application	8.G.A. 2,3, 4,5
G-CO.D.13	Procedural skill & fluency, Conceptual Understanding & Application	8.G.A.2,3, 4,5

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TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
Properties of Angles and Segments in Circles **(Allow approximately 2.5 weeks for instruction, review, and assessment)**			
Domain: Circles (G.C) **Cluster**: Understand and apply theorems about circles ❖ **G-C.A.2** Identify and describe relationships among inscribed angles, radii, and chords.	**Essential Question(s)** When lines intersect a circle, or within a circle, how do you find the measures of resulting angles, arcs, and segments? **Objective(s):** • Identify and describe relationships involving inscribed angles. • Prove properties of angles for a quadrilateral inscribed in a circle.	***Textbook Lesson*** Lesson 10.4 Inscribed Angles pp.709-716 ***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 Math: Opposite angles in a cyclic quadrilateral	**Vocabulary** Inscribed angle, intercepted arc **Writing in Math/Discussion** p.715 #50 Compare and contrast inscribed angles and central angles of a circle. If they intercept the same arc, how are they related?
Domain: Circles (G.C) **Cluster**: Understand and apply theorems about circles ➢ **G-C.A.2** Identify and describe relationships among inscribed angles, radii, and chords. ➢ **G-C.A.3** Construct the incenter and circumcenter of a triangle and use their properties to solve problems in context. **Domain**: Congruence (G.CO)	**Essential Question(s)** How can the properties of circles, polygons, lines and angles be useful when solving geometric problems? **Objective(s):** Students will • Identify and describe relationships among tangents and radii; • Identify and describe relationships among circumscribed angles and central angles; • Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	***Textbook Lessons*** Lesson 10.5 Tangents pp.718-725 Extend Lesson 10-5 Geometry Lab: Inscribed and Circumscribed Circles, p. 726 ***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 5, Topic C,	**Vocabulary** Tangent, point of tangency, common tangent **Writing in Math/Discussion** How many tangents can be drawn from a poir outside a circle, from a point on a circle, and from a point inside a circle? Explain your reasoning.

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TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
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.).	• Construct the inscribed and circumscribed circles of a triangle Construct a tangent line from a point.	Lesson 11: Properties of Tangents (If book is not available, use link below or visit https://greatminds.org to access materials.) engage^{ny} Geometry Module 5, Topic C, Lesson 11: Properties of Tangents **Task(s)** Tangent Lines and the Radius of a Circle Task GSE Analytic Geometry Unit 3: Circles and Volume (select from the tasks)	
Domain: Circles (G.C) **Cluster**: Understand and apply theorems about circles ➢ **G-C.A.2** Identify and describe relationships among inscribed angles, radii, and chords.	**Essential Question(s)** • How can the properties of circles, polygons, lines and angles be useful when solving geometric problems? **Objective(s):** Students will • Find measures of angles formed by lines intersecting on or inside a circle and describe the relationships; • Find measures of angles formed by lines intersecting outside the circle and describe the relationships.	***Textbook Lesson*** Lesson 10-6 Secants, Tangents, and Angle Measures, pp. 727-735 ***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 5, Topic C Lesson 16: Similar Triangles in Circle-Secant (or Circle-Secant-Tangent) Diagrams **Task(s)** Chords, Secants, and Tangents Tasks, pp. 56	**Vocabulary** Secant **Ticket Out the Door** Select examples and ask students to name the segments in the figure as they leave.

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
		& 69 GSE Analytic Geometry Unit 3: Circles and Volume (select from the tasks)	
Domain: Circles (G.C) **Cluster**: Understand and apply theorems about circles ➢ **G-C.A.2** Identify and describe relationships among inscribed angles, radii, and chords.	**Essential Question(s)** How can the properties of circles, polygons, lines and angles be useful when solving geometric problems? **Objective(s):** Students will • Find measures of segments that intersect in the interior of a circle and describe the relationships; • Find measures of segments that intersect in the exterior of a circle and describe the relationships.	***Textbook Lesson*** Lesson 10-7 Special Segments in Circles, pp. 736-742	**Vocabulary** Chord segment, secant, external secant segment, tangent segment **Writing in Math/Discussion** Describe the relationship among segments in a circle when two secants intersect inside a circle. Ask students to describe how the lesson on secants, tangents, and angles (10-6) helped them better understand the lesson on special segments in a circle.
Arc Length, Sector Area, and Equations of Circles **Use coordinates to prove simple geometric theorems algebraically** **(Allow approximately 1 week for instruction, review, and assessment)**			
Domain: Expressing Geometric Properties with Equations (G.GPE) **Cluster:** Translate between the geometric description and the equation for a conic section ➢ **G-GPE.A.1** Know and write the equation of a circle of given center and radius using the Pythagorean	**Essential Question(s)** How can the properties of circles, polygons, lines and angles be useful when solving geometric problems? **Objective(s):** Students will	***Textbook Lesson*** Lesson 10-8 – Equations of Circles and Graphing Technology Lab 10.8 (using TI-Nspire), pp.743 - 749 ***Optional: Use the following resources to ensure that the intended outcome and level***	**Vocabulary** Compound locus **Writing in Math/Discussion** Describe how the equation for a circle change if the circle is translated *a* units to the right an *b* units down.

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TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
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**: Circles (G.C) **Cluster**: Find arc lengths and areas of sectors of circles **G.C.B.4** Know the formula and find the area of a sector of a circle in a real-world context.	• Derive the equation of a circle given the center and the radius. • Complete the square to find the center and radius of a circle by an equation.	***of rigor of the standards are met.*** **HS Flip Book with examples of each Standard** (Designed as a resource tool to assist teachers in deepening their understanding of what each standard means in terms of what students must know and be able to do. It outlines only a *sample* of instructional strategies and examples. Links to conceptual categories and specific standards in the document can be accessed from page 5 *Mathematics Standards for High School*.) **Task(s)** Equations of Circles Lesson GSE Analytic Geometry Unit 3: Circles and Volume (select from the tasks)	
Domain: Expressing Geometric Properties with Equations (G.GPE) **Cluster:** Translate between the geometric description and the equation for a conic section ➢ **G-GPE.A.1** Know and write the equation of a circle of given center and radius using the Pythagorean Theorem. **Domain**: Expressing Geometric Properties with Equations (G.GPE) **Cluster:** Use coordinates to prove simple	**Essential Question(s)** How can the properties of circles, polygons, lines and angles be useful when solving geometric problems? **Objective(s):** Students will • Derive a formula for the area of a sector of a circle; • Find the area of circles and sectors of circles.	***Textbook Lesson*** Lesson 11-3 – Areas of Circles, pp.782 – 788 ***Eureka Math*** Eureka Math Geometry Module 3, Topic A, Lesson 4: Proving the Area of A Disk ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.***	**Vocabulary** Sector of a circle, segment of a circle **Writing in Math/Discussion** If the radius of a circle doubles, will the measure of a sector of that circle double? Wil double if the arc measure of that sector doubles?

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TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
geometric theorems algebraically **G-GPE.B.2** Use coordinates to prove simple geometric theorems algebraically. **Domain**: Circles (G.C) **Cluster**: Find arc lengths and areas of sectors of circles ➢ **G.C.B.4** Know the formula and find the area of a sector of a circle in a real-world context.		**Task(s)** Arc Length and Area of Sector Tasks, p. 82 & p.91 GSE Analytic Geometry Unit 3: Circles and Volume (select from the tasks) **ACT Practice** (sample problems to prepare for the ACT) Glencoe, pp.774-775	**Ticket Out the Door** Have students describe how to find the area c circle, given its circumference.
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 ■ **G-GPE.B.4** Find the point on a directed line segment between two given points that partitions the segment in a given ratio	**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.	***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.* Dividing Line Segments Expressing Geometric Properties with Equations HSG-GPE.B.6	
Visualizing Solids and Volume of Solids **(Allow approximately 2.5 weeks for instruction, review, and assessment)**			

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TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
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)** In what ways, can geometric figures be used to understand real-world problems? **Objective(s):** Students will • Investigate cross sections of three-dimensional figures.	***Textbook Lesson*** Lesson 12-1 – Representations of Three-Dimensional Figures, Lesson pp. 823-828 ***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 3, Topic B Lesson 7: General Pyramids and Cones and Their Cross-Sections **HS Flip Book with examples of each Standard** (Designed as a resource tool to assist teachers in deepening their understanding of what each standard means in terms of what students must know and be able to do. It outlines only a *sample* of instructional strategies and examples. Links to conceptual categories and specific standards in the document can be accessed from page 5 *Mathematics Standards for High School*.) **Task(s)** Volumes of Cylinders, Cones, Pyramids, and Spheres Videos Volumes of Cylinders, Cones, Pyramids, and Spheres Task, p.98 Unit on Area, Perimeter, and Volume with	**Vocabulary** Isometric view, cross section **Writing in Math/Discussion** When an object on a video game is viewed from only one side, what are some ways that the object can be made to appear three-dimensional?

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
		multiple tasks • Boxing Basketballs p.5 • Great Pyramid p.21 • Walter and Juanita's Water Troughs p.25 • Greenhouse p.31	
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)** • In what ways, can geometric figures be used to understand real-world problems? • How do surface volume and area compare to each other? **Objective(s):** Students will • Find the lateral area and surface area of prisms to solve problems. • Find the lateral area and surface area of cylinders to solve problems.	***Textbook Lesson*** Lesson 12-2 – Surface Area of Prisms and Cylinders, pp.830-837 ***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)** Cereal Box Project (Surface Area & Volume) Tasks	**Vocabulary** Lateral face, lateral edge, base edge, altitude height, lateral area, axis, composite solid **Writing in Math/Discussion** Compare and contrast finding the surface are of a prism and finding the surface area of a cylinder.
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)** • In what ways, can geometric figures be used to understand real-world problems? • How do surface volume and area compare to each other? **Objective(s):** Students will • Find the lateral area and surface area of	***Textbook Lesson*** Lesson 12-3 – Surface Area of Pyramids and Cones, pp.838-846	**Vocabulary** Regular pyramid, slant height, right cone, oblique cone **Writing in Math/Discussion** p. 845, #41 Describe how to find the surface area of a regular polygonal pyramid with an *n* gon base, height *h* units and an apothem of *a* units.

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	pyramids to solve problems. • Find the lateral area and surface area of cones to solve problems.		
Domain: Geometric Measurement and Dimension (G.GMD) **Cluster:** Explain volume formulas and use them to solve problems ➢ **G-GMD.A.1** Give an informal argument for the formulas for the circumference of a circle and the volume and surface area of a cylinder, cone, prism, and pyramid. ➢ **G-GMD.A.2** Know and use volume and surface area formulas for cylinders, cones, prisms, pyramids, and spheres to solve problems.★★	**Essential Question(s)** • In what ways do we use cones, cylinders, spheres, right rectangular prisms, triangular prisms in real-life? • How do I find the surface area and volume of a three dimensional figure? **Objective(s):** Students will • Find volumes of prisms and cylinders in the context of the real world.	***Textbook Lesson*** Lesson 12.4 pp. 847-854 ***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 3, Topic B Lesson 5: Three-Dimensional Space Lesson 6: General Prisms and Cylinders and Their Cross-Sections **Task(s)** How much money is that? (prism) Centerpiece (cylinder)	**Writing in Math/Discussion** Write a helpful response to the following questions posted on an Internet garden forum *"I am new to gardening. The nursery will deli a truckload of soil, which they say is 4 yards. know that a yard is 3 feet, but what is a yard soil? How do I know what to order?"*
Domain: Geometric Measurement and Dimension (G.GMD) **Cluster:** Explain volume formulas and use them to solve problems ➢ **G-GMD.A.1** Give an informal argument for the formulas for the circumference of a circle and the volume and surface area of a cylinder, cone, prism, and pyramid.	**Essential Question(s)** • In what ways do we use cones, cylinders, spheres, right rectangular prisms, triangular prisms in real-life? • How do I find the surface area and volume of a three dimensional figure?	***Textbook Lesson*** Lesson 12.5 pp. 857-863 ***Optional: Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.***	**Writing in Math/Discussion** Compare and contrast finding volumes of pyramids and cones with finding volumes of prisms and cylinders.

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TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
➢ **G-GMD.A.2** Know and use volume and surface area formulas for cylinders, cones, prisms, pyramids, and spheres to solve problems.★★	**Objective(s):** Students will • Understand the precise language that describes the properties of volume. • Find volumes of pyramids and cones in the context of the real world.	**Eureka Math** Eureka Math Geometry, Module 3, Topic B Lesson 7: General Pyramids and Cones and Their Cross-Sections Lesson 8: Definition and Properties of Volume Lesson 9: Scaling Principle for Volumes Lesson 10: The Volume of Prisms and Cylinders and Cavalieri's Principle **Task(s)** Doctors Appointment (cone) Great Egyptian Pyramids (pyramid)	
Domain: Modeling with Geometry (G.MG) **Cluster**: Apply geometric concepts in modeling situations ■ **G-MG.A.2** Apply geometric methods to solve realworld problems.★★	**Essential Question(s)** • In what ways, can geometric figures be used to understand real-world problems? • How do surface volume and area compare to each other? **Objective(s):** Students will • Find the surface area of a sphere to solve problems	***Textbook Lesson*** Lesson 12-6 – Surface Areas of Spheres, pp.864-871 ***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**	**Vocabulary** Great circle, pole, hemisphere **Writing in Math/Discussion** Describe the difference between the surface area of a sphere and the volume of a sphere.

RESOURCE TOOLBOX		
Textbook Resources	**Standards**	**Videos**
ConnectED Site - Textbook and Resources	Common Core Standards - Mathematics	Math TV Videos

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Glencoe Video Lessons Hotmath - solutions to odd problems 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	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 Chicago Public Schools Framework and Tasks **Tennessee Academic Standards for Mathematics** **Tennessee Assessment LiveBinder**	The Teaching Channel Khan Academy Videos (Geometry) **NWEA MAP Resources:**https://teach.mapnwea.org/assist/help_map/ApplicationHelp.htm#UsingTestResults/MAPReportsFinder.htm - Sign in and Click the Learning Continuum Tab – this resources will help as you plan for intervention, and differentiating small group instruction on the skill you are currently teaching. (Four Ways to Impac Teaching with the Learning Continuum) https://support.nwea.org/khanrit - These Khan Academy lessons are aligned to RIT scores.