Geometry | Tennessee Academic Standards for Mathematics Correlation to *Eureka Math*®

About *Eureka Math*

Created by Great Minds®, a mission-driven Public Benefit Corporation, *Eureka Math*® helps teachers deliver unparalleled math instruction that provides students with a deep understanding and fluency in math. Crafted by teachers and math scholars, the curriculum carefully sequences the mathematical progressions to maximize coherence from Prekindergarten through Precalculus—a principle tested and proven to be essential in students' mastery of math.

Teachers and students using *Eureka Math* find the trademark "Aha!" moments in *Eureka Math* to be a source of joy and inspiration, lesson after lesson, year after year.

Aligned

Great Minds offers detailed analyses that demonstrate how each grade of *Eureka Math* aligns with specific state standards. Access these free alignment studies at greatminds.org/state-studies.

Data

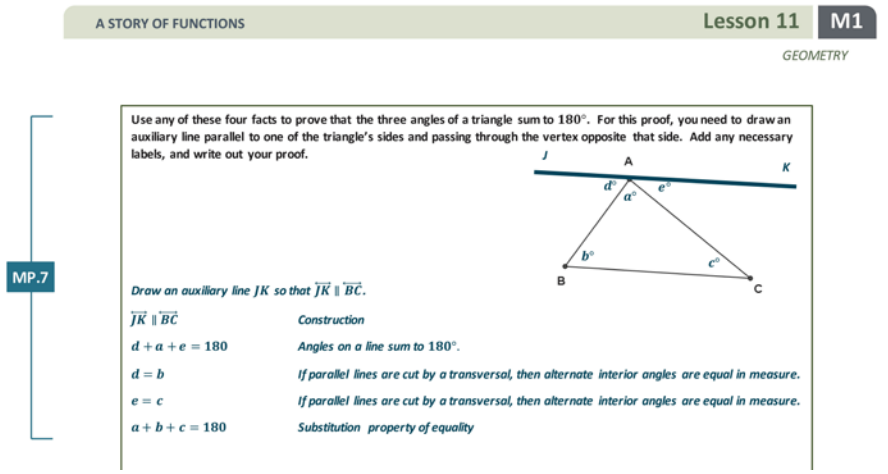
Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

Full Suite of Resources

Great Minds offers the *Eureka Math* curriculum as PDF downloads for free, noncommercial use. Access the free PDFs at greatminds.org/math/curriculum.

The teacher–writers who created the curriculum have also developed essential resources, available only from Great Minds, including the following:

- Printed material in English and Spanish
- Digital resources
- Professional development
- Classroom tools and manipulatives
- Teacher support materials
- Parent resources

Standards for Mathematical Practice	Aligned Components of *Eureka Math*
MP.1 Make sense of problems and persevere in solving them.	Lessons in every module engage students in mathematical practices. These are designated in the Module Overview and labeled in lessons. For example: 
MP.2 Reason abstractly and quantitatively.	
MP.3 Construct viable arguments and critique the reasoning of others.	
MP.4 Model with mathematics.	
MP.5 Use appropriate tools strategically.	
MP.6 Attend to precision.	
MP.7 Look for and make use of structure.	
MP.8 Look for and express regularity in repeated reasoning.	

Quantities

G.N.Q.A Reason quantitatively and use units to solve problems.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.N.Q.A.1 Use units as a way to understand real-world problems.	Algebra I M1 Topic A: Introduction to Functions Studied This Year—Graphing Stories Algebra I M1 Lesson 25: Solving Problems in Two Ways—Rates and Algebra Algebra I M1 Lesson 28: Federal Income Tax
G.N.Q.A.1a Use appropriate quantities in formulas, converting units as necessary.	Algebra I M1 Topic A: Introduction to Functions Studied This Year—Graphing Stories Algebra I M1 Lesson 25: Solving Problems in Two Ways—Rates and Algebra Algebra I M1 Lesson 28: Federal Income Tax
G.N.Q.A.1b Define and justify appropriate quantities within a context for the purpose of modeling.	Algebra I M1 Topic A: Introduction to Functions Studied This Year—Graphing Stories Algebra I M5 Lesson 1: Analyzing a Graph Algebra I M5 Lesson 4: Modeling a Context from a Graph Algebra I M5 Lesson 7: Modeling a Context from Data Algebra I M5 Lesson 8: Modeling a Context from a Verbal Description Algebra I M5 Lesson 9: Modeling a Context from a Verbal Description
G.N.Q.A.1c Choose an appropriate level of accuracy when reporting quantities.	Algebra I M1 Topic A: Introduction to Functions Studied This Year—Graphing Stories Algebra I M5 Lesson 6: Modeling a Context from Data Algebra I M5 Lesson 7: Modeling a Context from Data Algebra I M5 Lesson 9: Modeling a Context from a Verbal Description

Congruence

G.CO.A Experiment with transformations in the plane.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.CO.A.1 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, by hand for basic transformations and using technology for more complex cases.	Geometry M1 Lesson 12: Transformations—The Next Level Geometry M1 Lesson 13: Rotations Geometry M1 Lesson 14: Reflections Geometry M1 Lesson 15: Rotations, Reflections, and Symmetry Geometry M1 Lesson 16: Translations Geometry M1 Lesson 18: Looking More Carefully at Parallel Lines Geometry M1 Lesson 19: Construct and Apply a Sequence of Rigid Motions Geometry M1 Lesson 20: Applications of Congruence in Terms of Rigid Motions Geometry M1 Lesson 21: Correspondence and Transformations Geometry M2 Lesson 6: Dilations as Transformations of the Plane
G.CO.A.2 Given a rectangle, parallelogram, trapezoid, or regular polygon, determine the transformations that carry the shape onto itself and describe them in terms of the symmetry of the figure.	Geometry M1 Lesson 15: Rotations, Reflections, and Symmetry Geometry M1 Lesson 21: Correspondence and Transformations
G.CO.A.3 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	Geometry M1 Lesson 12: Transformations—The Next Level Geometry M1 Lesson 13: Rotations Geometry M1 Lesson 14: Reflections Geometry M1 Lesson 16: Translations

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.CO.A.4 Given a geometric figure, draw the image of the figure after a sequence of one or more rigid motions, by hand and using technology. Identify a sequence of rigid motions that will carry a given figure onto another.	Geometry M1 Lesson 13: Rotations Geometry M1 Lesson 14: Reflections Geometry M1 Lesson 16: Translations Geometry M1 Lesson 18: Looking More Carefully at Parallel Lines Geometry M1 Lesson 19: Construct and Apply a Sequence of Rigid Motions Geometry M1 Lesson 20: Applications of Congruence in Terms of Rigid Motions Geometry M1 Lesson 21: Correspondence and Transformations

Congruence

G.CO.B Understand congruence in terms of rigid motions.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.CO.B.5 Given two figures, use the definition of congruence in terms of rigid motions to determine informally if they are congruent.	Geometry M1 Lesson 19: Construct and Apply a Sequence of Rigid Motions Geometry M1 Lesson 20: Applications of Congruence in Terms of Rigid Motions Geometry M1 Lesson 34: Review of the Assumptions
G.CO.B.6 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.	Geometry M1 Lesson 19: Construct and Apply a Sequence of Rigid Motions Geometry M1 Lesson 20: Applications of Congruence in Terms of Rigid Motions Geometry M1 Lesson 21: Correspondence and Transformations Geometry M1 Topic D: Congruence Geometry M1 Lesson 34: Review of the Assumptions

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.CO.B.7 Explain how the criteria for triangle congruence (ASA, SAS, AAS, SSS, and HL) follow from the definition of congruence in terms of rigid motions.	Geometry M1 Lesson 22: Congruence Criteria for Triangles—SAS Geometry M1 Lesson 24: Congruence Criteria for Triangles—ASA and SSS Geometry M1 Lesson 25: Congruence Criteria for Triangles—AAS and HL Geometry M1 Lesson 34: Review of the Assumptions

Congruence

G.CO.C Use geometric theorems to justify relationships.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.CO.C.8 Use definitions and theorems about lines and angles to solve problems and to justify relationships in geometric figures.	Geometry M1 Topic B: Unknown Angles Geometry M1 Lesson 18: Looking More Carefully at Parallel Lines Geometry M1 Lesson 33: Review of the Assumptions
G.CO.C.9 Use definitions and theorems about triangles to solve problems and to justify relationships in geometric figures.	Geometry M1 Lesson 23: Base Angles of Isosceles Triangles Geometry M1 Lesson 29: Special Lines in Triangles Geometry M1 Lesson 30: Special Lines in Triangles Geometry M1 Topic G: Axiomatic Systems
G.CO.C.10 Use definitions and theorems about parallelograms to solve problems and to justify relationships in geometric figures.	Geometry M1 Lesson 28: Properties of Parallelograms Geometry M1 Lesson 34: Review of the Assumptions

Congruence

G.CO.D Perform geometric constructions.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.CO.D.11 Perform formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	Geometry M1 Topic A: Basic Constructions Geometry M1 Lesson 13: Rotations Geometry M1 Lesson 14: Reflections Geometry M1 Lesson 16: Translations Geometry M1 Lesson 17: Characterize Points on a Perpendicular Bisector Geometry M1 Lesson 18: Looking More Carefully at Parallel Lines
G.CO.D.12 Use geometric constructions to solve geometric problems in context, by hand and using technology.	Geometry M1 Lesson 3: Copy and Bisect an Angle Geometry M1 Lesson 4: Construct a Perpendicular Bisector

Similarity, Right Triangles, and Trigonometry

G.SRT.A Understand similarity in terms of similarity transformations.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.SRT.A.1 Use properties of dilations given by a center and a scale factor to solve problems and to justify relationships in geometric figures.	Geometry M2 Lesson 1: Scale Drawings Geometry M2 Lesson 2: Making Scale Drawings Using the Ratio Method Geometry M2 Lesson 3: Making Scale Drawings Using the Parallel Method Geometry M2 Lesson 5: Scale Factors Geometry M2 Topic B: Dilations

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.SRT.A.2 Define similarity in terms of transformations. Use transformations to determine whether two figures are similar.	Geometry M2 Lesson 12: What Are Similarity Transformations, and Why Do We Need Them? Geometry M2 Lesson 13: Properties of Similarity Transformations Geometry M2 Lesson 14: Similarity

Similarity, Right Triangles, and Trigonometry

G.SRT.B Use similarity to solve problems and justify relationships.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.SRT.B.3 Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures.	Geometry M2 Lesson 16: Between-Figure and Within-Figure Ratios Geometry M2 Lesson 17: The Side-Angle-Side (SAS) and Side-Side-Side (SSS) Criteria for Two Triangles to Be Similar Geometry M2 Lesson 18: Similarity and the Angle Bisector Theorem Geometry M2 Topic D: Applying Similarity to Right Triangles

Similarity, Right Triangles, and Trigonometry

G.SRT.C Define trigonometric ratios and solve problems involving triangles.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.SRT.C.4 Use side ratios in right triangles to define trigonometric ratios.	*This standard is fully addressed by the lessons aligned to its subsections.*

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.SRT.C.4a 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.	Geometry M2 Lesson 25: Incredibly Useful Ratios Geometry M2 Lesson 26: The Definition of Sine, Cosine, and Tangent Geometry M2 Lesson 29: Applying Tangents
G.SRT.C.4b Explain and use the relationship between the sine and cosine of complementary angles.	Geometry M2 Lesson 27: Sine and Cosine of Complementary Angles and Special Angles Geometry M2 Lesson 28: Solving Problems Using Sine and Cosine
G.SRT.C.5 Solve triangles.	*This standard is addressed by the lessons aligned to its subsections.*
G.SRT.C.5a Know and use the Pythagorean Theorem and trigonometric ratios (sine, cosine, tangent, and their inverses) to solve right triangles in a real-world context.	Geometry M2 Lesson 27: Sine and Cosine of Complementary Angles and Special Angles Geometry M2 Lesson 28: Solving Problems Using Sine and Cosine Geometry M2 Lesson 29: Applying Tangents Geometry M2 Lesson 30: Trigonometry and the Pythagorean Theorem Geometry M2 Lesson 31: Using Trigonometry to Determine Area Geometry M2 Lesson 32: Using Trigonometry to Find Side Lengths of an Acute Triangle Geometry M2 Lesson 33: Applying the Laws of Sines and Cosines Geometry M2 Lesson 34: Unknown Angles

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.SRT.C.5b Know and use relationships within special right triangles to solve problems in a real-world context.	Geometry M2 Lesson 24: Prove the Pythagorean Theorem Using Similarity *Supplemental material is necessary to address problems in a real-world context.*
G.SRT.C.5c Use the Law of Sines and Law of Cosines to solve non-right triangles in a real-world context.	Geometry M2 Lesson 33: Applying the Laws of Sines and Cosines

Circles

G.C.A Find areas of sectors of circles.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.C.A.1 Use proportional relationships between the area of a circle and the area of a sector within the circle to solve problems in a real-world context.	Geometry M5 Lesson 9: Arc Length and Areas of Sectors Geometry M5 Lesson 10: Unknown Length and Area Problems

Expressing Geometric Properties with Equations

G.GPE.A Use coordinates to solve problems and justify simple geometric theorems algebraically.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.GPE.A.1 Use coordinates to justify geometric relationships algebraically and to solve problems.	Geometry M4 Lesson 1: Searching a Region in the Plane Geometry M4 Lesson 2: Finding Systems of Inequalities That Describe Triangular and Rectangular Regions Geometry M4 Lesson 3: Lines That Pass Through Regions Geometry M4 Topic C: Perimeters and Areas of Polygonal Regions in the Cartesian Plane
G.GPE.A.2 Use the slope criteria for parallel and perpendicular lines to solve problems and to justify relationships in geometric figures.	Geometry M4 Lesson 4: Designing a Search Robot to Find a Beacon Geometry M4 Topic B: Perpendicular and Parallel Lines in the Cartesian Plane Geometry M5 Lesson 19: Equations for Tangent Lines to Circles
G.GPE.A.3 Understand the relationship between the Pythagorean Theorem and the distance formula and use an efficient method to solve problems on the coordinate plane.	G8 M2 Lesson 16: Applications of the Pythagorean Theorem G8 M7 Lesson 17: Distance on the Coordinate Plane G8 M7 Lesson 18: Applications of the Pythagorean Theorem

Geometric Measurement and Dimension

G.GMD.A Explain volume and surface area formulas and use them to solve problems.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.GMD.A.1 Understand and explain the formulas for the volume and surface area of a cylinder, cone, prism, and pyramid.	G7 M6 Lesson 23: Surface Area G7 M6 Lesson 24: Surface Area Geometry M3 Lesson 8: Definition and Properties of Volume Geometry M3 Lesson 10: The Volume of Prisms and Cylinders and Cavalieri's Principle Geometry M3 Lesson 11: The Volume Formula of a Pyramid and Cone Geometry M3 Lesson 12: The Volume Formula of a Sphere *Supplemental material is necessary to address surface area of cones and cylinders.*
G.GMD.A.2 Use volume and surface area formulas for cylinders, cones, prisms, pyramids, and spheres to solve problems in a real-world context.	Geometry M3 Lesson 8: Definition and Properties of Volume Geometry M3 Lesson 9: Scaling Principle for Volumes Geometry M3 Lesson 11: The Volume Formula of a Pyramid and Cone Geometry M3 Lesson 12: The Volume Formula of a Sphere Geometry M3 Lesson 13: How Do 3D Printers Work? *Supplemental material is necessary to address using surface area formulas to solve problems.*

Modeling with Geometry

G.MG.A Apply geometric concepts in modeling situations.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.MG.A.1 Use geometric shapes, their measures, and their properties to model objects found in a real-world context for the purpose of approximating solutions to problems.	Geometry M2 Lesson 19: Families of Parallel Lines and the Circumference of the Earth Geometry M2 Lesson 20: How Far Away Is the Moon? Geometry M3 Lesson 5: Three-Dimensional Space Geometry M3 Lesson 6: General Prisms and Cylinders and Their Cross-Sections Geometry M3 Lesson 11: The Volume Formula of a Pyramid and Cone Geometry M3 Lesson 12: The Volume Formula of a Sphere

Conditional Probability and the Rules of Probability

G.S.CP.A Understand independence and conditional probability and use them to create visual representations of data.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.S.CP.A.1 Use set notation to represent contextual situations.	*Supplemental material is necessary to address this standard.*
G.S.CP.A.1a Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or”, “and”, “not”).	Algebra II M4 Lesson 1: Chance Experiments, Sample Spaces, and Events Algebra II M4 Lesson 3: Calculating Conditional Probabilities and Evaluating Independence Using Two-Way Tables Algebra II M4 Lesson 4: Calculating Conditional Probabilities and Evaluating Independence Using Two-Way Tables Algebra II M4 Lesson 5: Events and Venn Diagrams Algebra II M4 Lesson 6: Probability Rules Algebra II M4 Lesson 7: Probability Rules

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.S.CP.A.1b Flexibly move between visual models (Venn diagrams, frequency tables, etc.) and set notation.	Algebra II M4 Lesson 5: Events and Venn Diagrams *Supplemental material is necessary to address set notation.*

Conditional Probability and the Rules of Probability

G.S.CP.B Use the rules of probability to compute probabilities of compound events in a uniform probability model.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.S.CP.B.2 Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A and interpret the answer in terms of the given context.	Algebra II M4 Lesson 3: Calculating Conditional Probabilities and Evaluating Independence Using Two-Way Tables Algebra II M4 Lesson 4: Calculating Conditional Probabilities and Evaluating Independence Using Two-Way Tables
G.S.CP.B.3 Understand and apply the Addition Rule.	*This standard is fully addressed by the lesson aligned to its subsections.*
G.S.CP.B.3a Explain the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ in terms of visual models (Venn diagrams, frequency tables, etc.).	Algebra II M4 Lesson 7: Probability Rules
G.S.CP.B.3b Apply the Addition Rule to solve problems and interpret the answer in terms of the given context.	Algebra II M4 Lesson 7: Probability Rules

Conditional Probability and the Rules of Probability

G.S.CP.C Apply geometric concepts to situations involving probability.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
G.S.CP.C.4 Calculate probabilities using geometric figures.	*Supplemental material is necessary to address this standard.*