EUREKA MATH™

GREAT MINDS

ABOUT *EUREKA MATH*

Created by the nonprofit Great Minds, *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

Eureka Math is the only curriculum found by EdReports.org to align fully with the Common Core State Standards for Mathematics for all grades, Kindergarten through Grade 8. Great Minds offers detailed analyses which 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

As a nonprofit, 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

Mathematics Standards of Learning for Virginia Public Schools Correlation to *Eureka Math*™

GEOMETRY

The majority of the Geometry Mathematics Standards of Learning for Virginia Public Schools are fully covered by the Geometry *Eureka Math* curriculum. The areas where the Geometry Mathematics Standards of Learning for Virginia Public Schools and Geometry *Eureka Math* do not align will require the use of *Eureka Math* content from another grade level or supplemental materials. A detailed analysis of alignment is provided in the table below. With strategic placement of supplemental materials, *Eureka Math* can ensure students are successful in achieving the proficiencies of the Geometry Mathematics Standards of Learning for Virginia Public Schools while still benefiting from the coherence and rigor of *Eureka Math*.

INDICATORS

Green indicates that the Virginia standard is fully addressed in *Eureka Math*.

Yellow indicates that the Virginia standard may not be completely addressed in *Eureka Math*.

Red indicates that the Virginia standard is not addressed in *Eureka Math*.

Blue indicates there is a discrepancy between the grade level at which this standard is addressed in the Virginia standards and in *Eureka Math*.

Mathematical Process Goals	Aligned Components of *Eureka Math*
Mathematical Problem Solving Students will apply mathematical concepts and skills and the relationships among them to solve problem situations of varying complexities. Students also will recognize and create problems from real-world data and situations within and outside mathematics and then apply appropriate strategies to determine acceptable solutions. To accomplish this goal, students will need to develop a repertoire of skills and strategies for solving a variety of problem types. A major goal of the mathematics program is to help students apply mathematics concepts and skills to become mathematical problem solvers.	This process goal is analogous to the CCSSM Standards for Mathematical Practice 1 and 2, which are specifically addressed in the following modules: Geometry M4: Connecting Algebra and Geometry Through Coordinates Geometry M5: Circles With and Without Coordinates
Mathematical Communication Students will communicate thinking and reasoning using the language of mathematics, including specialized vocabulary and symbolic notation, to express mathematical ideas with precision. Representing, discussing, justifying, conjecturing, reading, writing, presenting, and listening to mathematics will help students to clarify their thinking and deepen their understanding of the mathematics being studied. Mathematical communication becomes visible where learning involves participation in mathematical discussions.	This process goal is analogous to the CCSSM Standards for Mathematical Practice 3 and 6, which are specifically addressed in the following modules: Geometry M1: Congruence, Proof, and Constructions Geometry M2: Similarity, Proof, and Trigonometry Geometry M3: Extending to Three Dimensions Geometry M5: Circles With and Without Coordinates

Mathematical Process Goals	Aligned Components of *Eureka Math*
Mathematical Reasoning Students will recognize reasoning and proof as fundamental aspects of mathematics. Students will learn and apply inductive and deductive reasoning skills to make, test, and evaluate mathematical statements and to justify steps in mathematical procedures. Students will use logical reasoning to analyze an argument and to determine whether conclusions are valid. In addition, students will use number sense to apply proportional and spatial reasoning and to reason from a variety of representations.	This process goal is analogous to the CCSSM Standards for Mathematical Practice 2 and 8, which are specifically addressed in the following modules: Geometry M1: Congruence, Proof, and Constructions Geometry M4: Connecting Algebra and Geometry Through Coordinates
Mathematical Connections Students will build upon prior knowledge to relate concepts and procedures from different topics within mathematics and see mathematics as an integrated field of study. Through the practical application of content and process skills, students will make connections among different areas of mathematics and between mathematics and other disciplines, and to real-world contexts. Science and mathematics teachers and curriculum writers are encouraged to develop mathematics and science curricula that support, apply, and reinforce each other.	This process goal is analogous to the CCSSM Standards for Mathematical Practice 4 and 5, which are specifically addressed in the following modules: Geometry M1: Congruence, Proof, and Constructions Geometry M4: Connecting Algebra and Geometry Through Coordinates
Mathematical Representations Students will represent and describe mathematical ideas, generalizations, and relationships using a variety of methods. Students will understand that representations of mathematical ideas are an essential part of learning, doing, and communicating mathematics. Students should make connections among different representations—physical, visual, symbolic, verbal, and contextual—and recognize that representation is both a process and a product.	This process goal is analogous to the CCSSM Standards for Mathematical Practice 4, which is specifically addressed in the following modules: Geometry M1: Congruence, Proof, and Constructions Geometry M4: Connecting Algebra and Geometry Through Coordinates

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
Reasoning, Lines, and Transformations	**G.1** The student will use deductive reasoning to construct and judge the validity of a logical argument consisting of a set of premises and a conclusion. This will include		
	a. identifying the converse, inverse, and contrapositive of a conditional statement;		Geometry M1 Lesson 11: Unknown Angle Proofs—Proofs of Known Facts Geometry M1 Lesson 18: Looking More Carefully at Parallel Lines Geometry M1 Lesson 21: Correspondence and Transformations Geometry M1 Lesson 28: Properties of Parallelograms Note: Supplemental material may be necessary to completely address this standard.
	b. translating a short verbal argument into symbolic form; and		Geometry M1 Lesson 1: Construct an Equilateral Triangle Geometry M1 Topic C: Transformations/Rigid Motions Geometry M2 Lesson 2: Making Scale Drawings Using the Ratio Method Geometry M2 Lesson 13: Properties of Similarity Transformations Geometry M3 Lesson 2: Properties of Area

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
	c. determining the validity of a logical argument.		Geometry M1: Congruence, Proof, and Constructions
	G.2 The student will use the relationships between angles formed by two lines intersected by a transversal to		
	a. prove two or more lines are parallel; and		Geometry M1 Topic B: Unknown Angles Geometry M1 Lesson 18: Looking More Carefully at Parallel Lines Geometry M1 Topic G: Axiomatic Systems Geometry M2 Topic A: Scale Drawings Geometry M4 Topic A: Rectangular and Triangular Regions Defined by Inequalities Geometry M4 Lesson 8: Parallel and Perpendicular Lines
	b. solve problems, including practical problems, involving angles formed when parallel lines are intersected by a transversal.		Geometry M1 Lesson 18: Looking More Carefully at Parallel Lines Geometry M1 Topic G: Axiomatic Systems Geometry M2 Lesson 19: Families of Parallel Lines and the Circumference of the Earth Geometry M4 Lesson 8: Parallel and Perpendicular Lines Geometry M4 Lesson 14: Motion Along a Line—Search Robots Again

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
	G.3 The student will solve problems involving symmetry and transformation. This will include		
	a. investigating and using formulas for determining distance, midpoint, and slope;		Geometry M2 Lesson 7: How Do Dilations Map Segments? Geometry M2 Lesson 19: Families of Parallel Lines and the Circumference of the Earth Geometry M2 Lesson 29: Applying Tangents Geometry M4: Connecting Algebra and Geometry Through Coordinates
	b. applying slope to verify and determine whether lines are parallel or perpendicular;		Geometry M1 Topic B: Unknown Angles Geometry M1 Lesson 18: Looking More Carefully at Parallel Lines Geometry M2 Topic A: Scale Drawings Geometry M4 Topic A: Rectangular and Triangular Regions Defined by Inequalities Geometry M4 Lesson 8: Parallel and Perpendicular Lines
	c. investigating symmetry and determining whether a figure is symmetric with respect to a line or a point; and		Geometry M2 Topic C: Similarity and Dilations

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
	d. determining whether a figure has been translated, reflected, rotated, or dilated, using coordinate methods.		G8 M2 Topic A: Definitions and Properties of the Basic Rigid Motions Geometry M2 Lesson 5: Scale Factors Geometry M2 Lesson 6: Dilations as Transformations of the Plane Geometry M2 Lesson 7: How Do Dilations Map Segments? Geometry M2 Lesson 13: Properties of Similarity Transformations Geometry M4 Topic C: Perimeters and Areas of Polygonal Regions in the Cartesian Plane
	G.4 The student will construct and justify the constructions of		
	a. a line segment congruent to a given line segment;		Geometry M1 Topic A: Basic Constructions Geometry M1 Lesson 14: Reflections

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
	b. the perpendicular bisector of a line segment;		Geometry M1 Lesson 4: Construct a Perpendicular Bisector Geometry M1 Lesson 5: Points of Concurrencies Geometry M1 Lesson 14: Reflections Geometry M1 Lesson 17: Characterize Points on a Perpendicular Bisector Geometry M1 Lesson 31: Construct a Square and a Nine-Point Circle Geometry M2 Lesson 10: Dividing the King's Foot into 12 Equal Pieces
	c. a perpendicular to a given line from a point not on the line;		Geometry M1 Lesson 4: Construct a Perpendicular Bisector Geometry M1 Lesson 14: Reflections Geometry M4 Lesson 5: Criterion for Perpendicularity
	d. a perpendicular to a given line at a given point on the line;		Geometry M1 Lesson 4: Construct a Perpendicular Bisector Geometry M1 Lesson 14: Reflections Geometry M4 Lesson 5: Criterion for Perpendicularity
	e. the bisector of a given angle;		Geometry M1 Lesson 3: Copy and Bisect an Angle Geometry M1 Lesson 5: Points of Concurrencies

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
	f. an angle congruent to a given angle;		Geometry M1 Lesson 3: Copy and Bisect an Angle Geometry M1 Lesson 14: Reflections
	g. a line parallel to a given line through a point not on the line; and		Geometry M1 Lesson 4: Construct a Perpendicular Bisector Geometry M1 Lesson 14: Reflections Geometry M1 Lesson 18: Looking More Carefully at Parallel Lines Geometry M1 Lesson 29: Special Lines in Triangles
	h. an equilateral triangle, a square, and a regular hexagon inscribed in a circle.		Geometry M1 Topic A: Basic Constructions

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
Triangles	**G.5** The student, given information concerning the lengths of sides and/or measures of angles in triangles, will solve problems, including practical problems. This will include		
	a. ordering the sides by length, given angle measures;		Geometry M1 Lesson 8: Solve for Unknown Angles—Angles in a Triangle Geometry M1 Lesson 29: Special Lines in Triangles Geometry M1 Topic G: Axiomatic Systems Geometry M2 Lesson 1: Scale Drawings Geometry M2 Topic C: Similarity and Dilations Geometry M2 Lesson 25: Incredibly Useful Ratios 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

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
	b. ordering the angles by degree measure, given side lengths;		Geometry M1 Lesson 8: Solve for Unknown Angles—Angles in a Triangle Geometry M1 Lesson 29: Special Lines in Triangles Geometry M1 Topic G: Axiomatic Systems Geometry M2 Lesson 1: Scale Drawings Geometry M2 Topic C: Similarity and Dilations Geometry M2 Lesson 25: Incredibly Useful Ratios 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
	c. determining whether a triangle exists; and		G8 M7 Lesson 17: Distance on the Coordinate Plane Geometry M1 Lesson 29: Special Lines in Triangles Geometry M1 Topic G: Axiomatic Systems

Domain	Mathematical Content Standards	Aligned Components of *Eureka Math*
	d. determining the range in which the length of the third side must lie.	G8 M3 Lesson 14: The Converse of the Pythagorean Theorem G8 M7 Lesson 17: Distance on the Coordinate Plane Geometry M1 Lesson 29: Special Lines in Triangles Geometry M1 Topic G: Axiomatic Systems Geometry M2 Lesson 1: Scale Drawings 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
	G.6 The student, given information in the form of a figure or statement, will prove two triangles are congruent.	Geometry M4: Connecting Algebra and Geometry Through Coordinates
	G.7 The student, given information in the form of a figure or statement, will prove two triangles are similar.	Geometry M2 Lesson 4: Comparing the Ratio Method with the Parallel Method Geometry M2 Topic C: Similarity and Dilations Geometry M2 Topic D: Applying Similarity to Right Triangles Geometry M5 Lesson 16: Similar Triangles in Circle-Secant (or Circle-Secant-Tangent) Diagrams

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
	G.8 The student will solve problems, including practical problems, involving right triangles. This will include applying		
	a. the Pythagorean Theorem and its converse;		G8 M2 Topic D: The Pythagorean Theorem G8 M7 Lesson 18: Applications of the Pythagorean Theorem
	b. properties of special right triangles; and		Geometry M2 Topic D: Applying Similarity to Right Triangles Geometry M2 Lesson 21: Special Relationships Within Right Triangles—Dividing into Two Similar Sub-Triangles
	c. trigonometric ratios.		Geometry M2 Topic E: Trigonometry
Polygons and Circles	**G.9** The student will verify and use properties of quadrilaterals to solve problems, including practical problems.		Geometry M1 Lesson 28: Properties of Parallelograms Geometry M1 Topic G: Axiomatic Systems
	G.10 The student will solve problems, including practical problems, involving angles of convex polygons. This will include determining the		
	a. sum of the interior and/or exterior angles;		G8 M2 Lesson 13: Angle Sum of a Triangle G8 M2 Lesson 14: More on the Angles of a Triangle

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
	b. measure of an interior and/or exterior angle; and		G8 M2 Lesson 13: Angle Sum of a Triangle G8 M2 Lesson 14: More on the Angles of a Triangle
	c. number of sides of a regular polygon.		G8 M2 Lesson 13: Angle Sum of a Triangle G8 M2 Lesson 14: More on the Angles of a Triangle
	G.11 The student will solve problems, including practical problems, by applying properties of circles. This will include determining		
	a. angle measures formed by intersecting chords, secants, and/or tangents;		Geometry M5 Topic A: Central and Inscribed Angles Geometry M5 Topic C: Secants and Tangents
	b. lengths of segments formed by intersecting chords, secants, and/or tangents;		Geometry M5 Topic A: Central and Inscribed Angles Geometry M5 Topic C: Secants and Tangents
	c. arc length; and		Geometry M5 Topic B: Arcs and Sectors
	d. area of a sector.		Geometry M5 Topic B: Arcs and Sectors
	G.12 The student will solve problems involving equations of circles.		Geometry M5 Topic D: Equations for Circles and Their Tangents
Three-Dimensional Figures	**G.13** The student will use surface area and volume of three-dimensional objects to solve practical problems.		Geometry M3: Extending to Three Dimensions

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
	G.14 The student will apply the concepts of similarity to two- or three-dimensional geometric figures. This will include		
	a. comparing ratios between lengths, perimeters, areas, and volumes of similar figures;		Geometry M2 Lesson 2: Making Scale Drawings Using the Ratio Method Geometry M2 Lesson 4: Comparing the Ratio Method with the Parallel Method 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 M3: Extending to Three Dimensions Geometry M4 Lesson 3: Lines That Pass Through Regions Geometry M4 Lesson 9: Perimeter and Area of Triangles in the Cartesian Plane Geometry M5 Lesson 8: Arcs and Chords

Domain	Mathematical Content Standards		Aligned Components of *Eureka Math*
	b. determining how changes in one or more dimensions of a figure affect area and/or volume of the figure;		Geometry M2 Lesson 20: How Far Away Is the Moon? Geometry M2 Lesson 31: Using Trigonometry to Determine Area Geometry M3: Extending to Three Dimensions Geometry M5 Lesson 7: The Angle Measure of an Arc
	c. determining how changes in area and/or volume of a figure affect one or more dimensions of the figure; and		Geometry M2 Lesson 20: How Far Away Is the Moon? Geometry M2 Lesson 31: Using Trigonometry to Determine Area Geometry M3: Extending to Three Dimensions Geometry M5 Lesson 7: The Angle Measure of an Arc
	d. solving problems, including practical problems, about similar geometric figures.		Geometry M2 Topic C: Similarity and Dilations Geometry M3 Lesson 3: The Scaling Principle for Area