Geometry Common Core Curriculum

Congruence, Proof, and Constructions

Topic A: Basic Constructions (**G-CO.A.1**, **G-CO.D.12**, **G-CO.D.13**)

 Lessons 1–2: Construct an Equilateral Triangle

 Lesson 3: Copy and Bisect an Angle

 Lesson 4: Construct a Perpendicular Bisector

 Lesson 5: Points of Concurrencies

Topic B: Unknown Angles (**G-CO.C.9**)

 Lesson 6: Solve for Unknown Angles—Angles and Lines at a Point

 Lesson 7: Solve for Unknown Angles—Transversals

 Lesson 8: Solve for Unknown Angles—Angles in a Triangle

 Lesson 9: Unknown Angle Proofs—Writing Proofs

 Lesson 10: Unknown Angle Proofs—Proofs with Constructions

 Lesson 11: Unknown Angle Proofs—Proofs of Known Facts

Topic C: Transformations/Rigid Motions (**G-CO.A.2**, **G-CO.A.3**, **G-CO.A.4**, **G-CO.A.5**, **G-CO.B.6**, **G-CO.B.7**, **G-CO.D.12**)

 Lesson 12: Transformations—The Next Level

 Lesson 13: Rotations

 Lesson 14: Reflections

 Lesson 15: Rotations, Reflections, and Symmetry

 Lesson 16: Translations

 Lesson 17: Characterize Points on a Perpendicular Bisector

 Lesson 18: Looking More Carefully at Parallel Lines

 Lesson 19: Construct and Apply a Sequence of Rigid Motions

 Lesson 20: Applications of Congruence in Terms of Rigid Motions

 Lesson 21: Correspondence and Transformations

Topic D: Congruence (**G-CO.B.7**, **G-CO.B.8**)

 Lesson 22: Congruence Criteria for Triangles—SAS

 Lesson 23: Base Angles of Isosceles Triangles

 Lesson 24: Congruence Criteria for Triangles—ASA and SSS

Lesson 25: Congruence Criteria for Triangles—AAS and HL

 Lessons 26–27: Triangle Congruency Proofs

Topic E: Proving Properties of Geometric Figures (**G-CO.C.9**, **G-CO.C.10**, **G-CO.C.11**)

 Lesson 28: Properties of Parallelograms

 Lessons 29–30: Special Lines in Triangles

Topic F: Advanced Constructions (**G-CO.D.13**)

 Lesson 31: Construct a Square and a Nine-Point Circle

 Lesson 32: Construct a Nine-Point Circle

Topic G: Axiomatic Systems (**G-CO.A.1**, **G-CO.A.2**, **G-CO.A.3**, **G-CO.A.4**, **G-CO.A.5**, **G-CO.B.6**, **G-CO.B.7**, **G-CO.B.8**, **G-CO.C.9**, **G-CO.C.10**, **G-CO.C.11**, **G-CO.C.12**, **G-CO.C.13**)

Similarity, Proof, and Trigonometry

Topic A: Scale Drawings (**G-SRT.A.1**, **G-SRT.B.4, G-MG.A.3**)

 Lesson 1: Scale Drawings

 Lesson 2: Making Scale Drawings Using the Ratio Method

 Lesson 3: Making Scale Drawings Using the Parallel Method

 Lesson 4: Comparing the Ratio Method with the Parallel Method

 Lesson 5: Scale Factors

Topic B: Dilations (**G-SRT.A.1**, **G-SRT.B.4**)

 Lesson 6: Dilations as Transformations of the Plane

 Lesson 7: How Do Dilations Map Segments?

 Lesson 8: How Do Dilations Map Lines, Rays, and Circles?

 Lesson 9:  How Do Dilations Map Angles?

 Lesson 10:  Dividing the King’s Foot into 12 Equal Pieces

 Lesson 11:  Dilations from Different Centers

Topic C: Similarity and Dilations (**G-SRT.A.2**, **G-SRT.A.3**, **G-SRT.B.5**, **G-MG.A.1**)

 Lesson 12: What Are Similarity Transformations, and Why Do We Need Them?

 Lesson 13: Properties of Similarity Transformations

 Lesson 14: Similarity

 Lesson 15: The Angle-Angle (AA) Criterion for Two Triangles to be Similar

 Lesson 16: Between-Figure and Within-Figure Ratios

 Lesson 17: The Side-Angle-Side (SAS) and Side-Side-Side (SSS) Criteria for Two Triangles to be Similar

 Lesson 18: Similarity and the Angle Bisector Theorem

 Lesson 19: Families of Parallel Lines and the Circumference of the Earth

 Topic D: Applying Similarity to Right Triangles (**G-SRT.B.4**)

 Lesson 21: Special Relationships Within Right Triangles—Dividing into Two Similar Sub-Triangles

 Lesson 22: Multiplying and Dividing Expressions with Radicals

 Lesson 23: Adding and Subtracting Expressions with Radicals

 Lesson 24: Prove the Pythagorean Theorem Using Similarity

Topic E: Trigonometry (**G-SRT.C.6**, **G-SRT.C.7**, **G-SRT.C.8**)

 Lesson 25: Incredibly Useful Ratios

 Lesson 26: The Definition of Sine, Cosine, and Tangent

 Lesson 27: Sine and Cosine of Complementary Angles and Special Angles

 Lesson 28: Solving Problems Using Sine and Cosine

 Lesson 29: Applying Tangents

 Lesson 30: Trigonometry and the Pythagorean Theorem

 Lesson 31: Using Trigonometry to Determine Area

 Lesson 32: Using Trigonometry to Find Side Lengths of an Acute Triangle

 Lesson 33: Applying the Laws of Sines and Cosines

 Lesson 34: Unknown Angles

Extending to Three Dimensions

Topic A: Area (**G-GMD.A.1**)

 Lesson 1: What Is Area?

 Lesson 2: Properties of Area

 Lesson 3: The Scaling Principle for Area

 Lesson 4: Proving the Area of a Disk

Topic B: Volume (**G-GMD.A.1**, **G-GMD.A.3**, **G-GMD.B.4**, **G-MG.A.1**, **G-MG.A.2**, **G-MG.A.3**)

 Lesson 5: Three-Dimensional Space

 Lesson 6: General Prisms and Cylinders and Their Cross-Sections

 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

 Lesson 11: The Volume Formula of a Pyramid and Cone

 Lesson 12: The Volume Formula of a Sphere

 Lesson 13: How Do 3D Printers Work?

Connecting Algebra and Geometry Through Coordinates

Topic A: Rectangular and Triangular Regions Defined by Inequalities (**G-GPE.B.7**)

 Lesson 1: Searching a Region in the Plane

 Lesson 2: Finding Systems of Inequalities That Describe Triangular and Rectangular Regions

 Lesson 3: Lines That Pass Through Regions

 Lesson 4: Designing a Search Robot to Find a Beacon

Topic B: Perpendicular and Parallel Lines in the Cartesian Plane (**G-GPE.B.4**, **G-GPE.B.5**)

 Lesson 5: Criterion for Perpendicularity

 Lesson 6: Segments That Meet at Right Angles

 Lesson 7: Equations for Lines Using Normal Segments

 Lesson 8: Parallel and Perpendicular Lines

Topic C:Perimeters and Areas of Polygonal Regions in the Cartesian Plane (**G-GPE.B.7**)

 Lesson 9: Perimeter and Area of Triangles in the Cartesian Plane

 Lesson 10: Perimeter and Area of Polygonal Regions in the Cartesian Plane

 Lesson 11: Perimeters and Areas of Polygonal Regions Defined by Systems of Inequalities

Topic D: Partitioning and Extending Segments and Parameterization of Lines (**G-GPE.B.4**, **G-GPE.B.6**)

 Lesson 12: Dividing Segments Proportionately

 Lesson 13: Analytic Proofs of Theorems Previously Proved by Synthetic Means

 Lesson 14: Motion Along a Line—Search Robots Again (Optional)

 Lesson 15: The Distance from a Point to a Line

Circles With and Without Coordinates

Topic A: Central and Inscribed Angles (**G-C.A.2**, **G-C.A.3**)

 Lesson 1: Thales’ Theorem

 Lesson 2: Circles, Chords, Diameters, and Their Relationships

 Lesson 3: Rectangles Inscribed in Circles

 Lesson 4: Experiments with Inscribed Angles

 Lesson 5: Inscribed Angle Theorem and Its Applications

 Lesson 6: Unknown Angle Problems with Inscribed Angles in Circles

Topic B: Arcs and Sectors (**G-C.A.1**, **G-C.A.2**, **G-C.B.5**)

 Lesson 7: The Angle Measure of an Arc

 Lesson 8: Arcs and Chords

 Lesson 9: Arc Length and Areas of Sectors

 Lesson 10: Unknown Length and Area Problems

Topic C: Secants and Tangents (**G-C.A.2**, **G-C.A.3**)

 Lesson 11: Properties of Tangents

 Lesson 12: Tangent Segments

 Lesson 13: The Inscribed Angle Alternate—A Tangent Angle

 Lesson 14: Secant Lines; Secant Lines That Meet Inside a Circle

 Lesson 15: Secant Angle Theorem, Exterior Case

 Lesson 16: Similar Triangles in Circle-Secant (or Circle-Secant-Tangent) Diagrams

Topic D: Equations for Circles and Their Tangents (**G-GPE.A.1**, **G-GPE.B.4**)

 Lesson 17: Writing the Equation for a Circle

 Lesson 18: Recognizing Equations of Circles

 Lesson 19: Equations for Tangent Lines to Circles

Topic E: Cyclic Quadrilaterals and Ptolemy’s Theorem (**G-C.A.3**)

 Lesson 20: Cyclic Quadrilaterals

 Lesson 21: Ptolemy’s Theorem