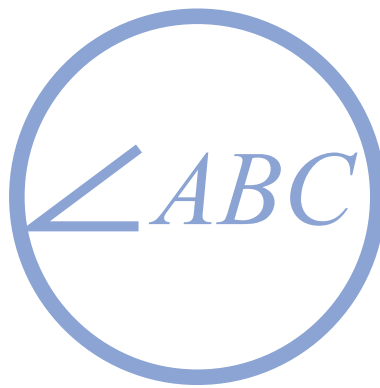
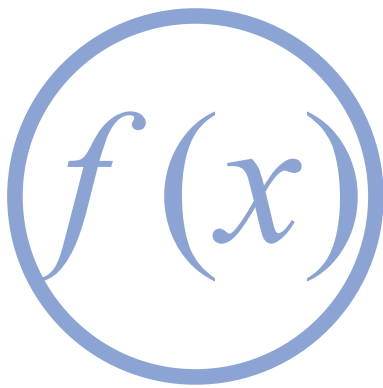


Common Core State Standards

Geometry

Traditional Pathway



Program Overview



This program was developed and reviewed by experienced math educators who have both academic and professional backgrounds in mathematics. This ensures: freedom from mathematical errors, grade level appropriateness, freedom from bias, and freedom from unnecessary language complexity.

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Special thanks to all the math educators who taught with or reviewed an earlier edition of these materials and provided feedback and suggestions. Your input has been invaluable.

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BW Walch

South Portland, ME 04106

bwwalch.com

Printed in the United States of America



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PROGRAM OVERVIEW

Table of Contents for Instructional Units

Unit 1: Congruence, Proof, and Constructions

Topic A: Introducing Transformations

Defining Terms

Transformations As Functions

Applying Lines of Symmetry

Conceptual Activities

Desmos. “Polygraph: Transformations.”

GeoGebra. “Draw (a) line of symmetry.”

Topic B: Defining and Applying Rotations, Reflections, and Translations

Defining Rotations, Reflections, and Translations

Applying Rotations, Reflections, and Translations

Conceptual Activity

GeoGebra. “Reflections, Rotations, Dilations, and Translations.”

Conceptual Task

The Transforming Key, Parts 1 and 2

Topic C: Exploring Congruence

Describing Rigid Motions and Predicting the Effects

Defining Congruence in Terms of Rigid Motions

Conceptual Activity

GeoGebra. “Congruence by Rigid Motions.”

Conceptual Task

Transformation Tests, Parts 1 and 2

Topic D: Congruent Triangles

Triangle Congruency

Explaining ASA, SAS, and SSS

Conceptual Activity

GeoGebra. “Congruence of triangles.”

Conceptual Task

Decoration Dilemma, Parts 1 and 2

Topic E: Proving Theorems About Lines and Angles

Proving the Vertical Angles Theorem

Proving Theorems About Angles in Parallel Lines Cut by a Transversal

Conceptual Activities

Desmos. “Lines, Transversals, and Angles.”

Desmos. “Polygraph: Angle Relationships.”

Desmos. “Polygraph: Figure It Out.”

GeoGebra. “Vertical Angles: Quick Exploration.”

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Standards Correlations

Conceptual Task

Triangulating a Waterspout, Parts 1 and 2

Topic F: Proving Theorems About Triangles

Proving the Interior Angle Sum Theorem
Proving Theorems About Isosceles Triangles
Proving the Midsegment of a Triangle
Proving Centers of Triangles

Conceptual Activity

GeoGebra. “Triangle Angle Theorems.”

Conceptual Task

String Games, Parts 1 and 2

Topic G: Proving Theorems About Parallelograms

Proving Properties of Parallelograms
Proving Properties of Special Quadrilaterals

Conceptual Activity

GeoGebra. “Parallelogram: Theorem 1.”

Topic H: Constructing Lines, Segments, and Angles

Copying Segments and Angles
Bisecting Segments and Angles
Constructing Perpendicular and Parallel Lines

Conceptual Activities

GeoGebra. “Basic Constructions.”

GeoGebra. “Constructing Parallel and Perpendicular Lines.”

Topic I: Constructing Polygons

Constructing Equilateral Triangles Inscribed in Circles
Constructing Squares Inscribed in Circles
Constructing Regular Hexagons Inscribed in Circles

Conceptual Activities

GeoGebra. “Equilateral Triangle Construction (Dynamic Illustration).”

GeoGebra. “Construct Equilateral Triangle Inscribed in a Circle.”

GeoGebra. “Hexagon-Construction.”

Unit Assessment

Station Activities

Rotations and Reflections
Corresponding Parts, Transformations, and Proof
Rhombi, Squares, Kites, and Trapezoids
Circumcenter, Incenter, Orthocenter, and Centroid
Parallel Lines and Transversals

PROGRAM OVERVIEW

Standards Correlations

Unit 2: Similarity, Proof, and Trigonometry

Topic A: Investigating Properties of Dilations

Investigating Properties of Parallelism and the Center

Investigating Scale Factors

Conceptual Activity

GeoGebra. “Dilation Exploration.”

Topic B: Defining and Applying Similarity

Defining Similarity

Applying Similarity Using the Angle-Angle (AA) Criterion

Conceptual Activity

GeoGebra. “Similar Figures: Dynamic Illustration.”

Conceptual Task

Similarity Investigation, Parts 1 and 2

Topic C: Proving Similarity

Proving Triangle Similarity Using Side-Angle-Side (SAS) and Side-Side-Side (SSS) Similarity

Working with Ratio Segments

Proving the Pythagorean Theorem Using Similarity

Solving Problems Using Similarity and Congruence

Conceptual Activity

GeoGebra. “Prove Similarity Theorems.”

Topic D: Exploring Trigonometric Ratios

Defining Trigonometric Ratios

Exploring Sine and Cosine As Complements

Conceptual Activity

GeoGebra. “Right Triangle Trigonometry: Intro.”

Topic E: Applying Trigonometric Ratios

Calculating Sine, Cosine, and Tangent

Calculating Cosecant, Secant, and Cotangent

Problem Solving with the Pythagorean Theorem and Trigonometry

Conceptual Activity

GeoGebra. “How Fast are You Spinning?”

Conceptual Task

Triangles? Yeah, Right, Parts 1 and 2

PROGRAM OVERVIEW

Standards Correlations

Topic F: Trigonometry of General Angles

Proving the Law of Sines

Proving the Law of Cosines

Applying the Laws of Sines and Cosines

Unit Assessment

Station Activities

Similarity and Scale Factor

Sine, Cosine, and Tangent Ratios, and Angles of Elevation and Depression

The Laws of Sines and Cosines

Unit 3: Extending to Three Dimensions

Topic A: Explaining and Applying Area and Volume Formulas

Circumference and Area of a Circle

Volumes of Cylinders, Pyramids, Cones, and Spheres

Conceptual Activity

GeoGebra. “Circumference = ? (Animation).”

Topic B: Two-Dimensional Cross Sections of Three-Dimensional Objects

Two-Dimensional Cross Sections of Three-Dimensional Objects

Conceptual Activities

GeoGebra. “Sections of Cones.”

GeoGebra. “Sections of Cubes.”

GeoGebra. “Sections of Cylinders.”

GeoGebra. “Sections of Rectangular Pyramids.”

GeoGebra. “Sections of Spheres.”

GeoGebra. “Sections of Triangular Prisms.”

GeoGebra. “Sections of Triangular Pyramids.”

Unit Assessment

Station Activity

Geometric Modeling

PROGRAM OVERVIEW

Standards Correlations

Unit 4: Connecting Algebra and Geometry Through Coordinates

Topic A: Slope and Distance

Using Coordinates to Prove Geometric Theorems with Slope and Distance

Working with Parallel and Perpendicular Lines

Conceptual Activities

GeoGebra. “Writing the Equation of Line from Graph in Slope-Intercept Form.”

GeoGebra. “Distance Formula.”

GeoGebra. “Parallel Lines.”

Conceptual Task

The Town Square, Parts 1 and 2

Topic B: Points on Line Segments

Midpoints and Other Points on Line Segments

Topic C: Calculating Perimeter and Area

Calculating Perimeter and Area

Conceptual Activities

GeoGebra. “Triangle Area Warmup.”

GeoGebra. “Perimeter of Triangles on the Coordinate Grid.”

Topic D: Defining Parabolas Geometrically

Deriving the Equation of a Parabola

Conceptual Activities

Desmos. “Polygraph: Parabola-Focus-Directrix.”

GeoGebra. “Conic Sections.”

Unit Assessment

Station Activities

Parallel Lines, Slopes, and Equations

Perpendicular Lines

Coordinate Proof with Quadrilaterals

PROGRAM OVERVIEW

Standards Correlations

Unit 5: Circles With and Without Coordinates

Topic A: Introducing Circles

Similar Circles and Central and Inscribed Angles

Chord Central Angles Conjecture

Properties of Tangents of a Circle

Conceptual Activity

GeoGebra. “Similar Circles?”

Conceptual Task

Moon Horizons, Parts 1 and 2

Topic B: Inscribed Polygons and Circumscribed Triangles

Constructing Inscribed Circles

Constructing Circumscribed Circles

Proving Properties of Inscribed Quadrilaterals

Conceptual Activity

GeoGebra. “Circumcircle: Construction Exercise (VA).”

Conceptual Task

Circle Constructions, Parts 1 and 2

Topic C: Constructing Tangent Lines

Constructing Tangent Lines

Conceptual Activity

“Tangent to Circle: Construction 1.”

Topic D: Finding Arc Lengths and Areas of Sectors

Defining Radians

Deriving the Formula for the Area of a Sector

Conceptual Activities

Desmos. “Sector Area.”

GeoGebra. “Movie: Radians to Revs.”

Conceptual Task

Circle Investigation, Parts 1 and 2

Topic E: The Equation of a Circle

Deriving the Equation of a Circle

Using Coordinates to Prove Geometric Theorems About Circles

Conceptual Activities

Desmos. “Equations of Circles.”

GeoGebra. “Circle Equation: Center NOT (0, 0).”

Topic F: Geometric Modeling with Circles

Modeling with Circles

Conceptual Activity

Desmos. “Circle Patterns.”

PROGRAM OVERVIEW

Standards Correlations

Unit Assessment

Station Activities

Circumference, Angles, Arcs, Chords, and Inscribed Angles
Special Segments, Angle Measurements, and Equations of Circles

Unit 6: Applications of Probability

Topic A: Events

Describing Events
The Addition Rule
Understanding Independent Events

Conceptual Activity

GeoGebra. “Set theory.”

Conceptual Task

Gym Survey Analysis, Parts 1 and 2

Topic B: Conditional Probability

Introducing Conditional Probability
Using Two-Way Frequency Tables
The Multiplication Rule

Conceptual Activities

GeoGebra. “Conditional probability.”
Illustrative Mathematics. “The Titanic 3.”

Conceptual Tasks

Allergies and Probabilities, Parts 1 and 2
Mathematics Assessment Resource Service, University of Nottingham. “Representing Conditional Probabilities 1.”

Topic C: Combinatorics

Combinations and Permutations
Probability with Combinatorics

Conceptual Activity

GeoGebra. “Permutation of different cards (distinguishable objects).”

Topic D: Making Decisions

Making Decisions
Analyzing Decisions

Unit Assessment

Station Activity

Probability

PROGRAM OVERVIEW

Introduction

The *Common Core State Standards Traditional Pathway: Geometry Program* is a complete set of materials developed around the Common Core State Standards, the CCSS curriculum map in Appendix A, and the Geometry course descriptions. The components are designed to support students in meeting and exceeding the standards encompassed by the Geometry course. The program realizes the benefits of exploratory and investigative learning, and employs a variety of instructional models to meet the needs of students across the range of learning styles.

This program realizes the benefits of exploratory and investigative learning and employs a variety of instructional models to meet the learning needs of students with a range of abilities.

The *Common Core State Standards Traditional Pathway: Geometry Program* includes components that support problem-based learning, instruct and coach as needed, provide practice, and assess students' skills. Instructional tools and strategies are embedded throughout.

The set of unit materials or digital version of the program includes:

- More than 150 hours of lessons, addressing the six units of CCSS TP: Geometry
- Essential Questions for each instructional topic
- Vocabulary
- Instruction and Guided Practice
- Problem-based Tasks and Coaching questions
- Step-by-step graphing calculator instructions for the TI-Nspire and the TI-83/84
- Station activities to promote collaborative learning and problem-solving skills

Purpose of Materials

The *Common Core State Standards Traditional Pathway: Geometry Program* has been organized to coordinate with the CCSS Traditional Pathway: Geometry content map and specifications from Appendix A of the Common Core State Standards.

Each lesson includes activities that offer opportunities for exploration and investigation. These activities incorporate concept and skill development and guided practice, then move on to the application of new skills and concepts in problem-solving situations. Throughout the lessons and activities, problems are contextualized to enhance rigor and relevance.

PROGRAM OVERVIEW

Introduction to the Program

This program includes all the topics addressed in the CCSS Traditional Pathway: Geometry content map. These include:

- Congruence, Proof, and Constructions
- Similarity, Proof, and Trigonometry
- Extending to Three Dimensions
- Connecting Algebra and Geometry Through Coordinates
- Circles With and Without Coordinates
- Applications of Probability

The eight Mathematical Practices described in the Common Core are infused throughout and are as follows:

- CCSS.MP.1: Make sense of problems and persevere in solving them.
- CCSS.MP.2: Reason abstractly and quantitatively.
- CCSS.MP.3: Construct viable arguments and critique the reasoning of others.
- CCSS.MP.4: Model with mathematics.
- CCSS.MP.5: Use appropriate tools strategically.
- CCSS.MP.6: Attend to precision.
- CCSS.MP.7: Look for and make use of structure.
- CCSS.MP.8: Look for and express regularity in repeated reasoning.

Structure of the Teacher Resource

The *CCSS Traditional Pathway: Geometry Program* is provided as a collection of unit books and an overview book, or in binder format. The materials are completely reproducible. You may also have purchased the *CCSS Traditional Pathway: Geometry Teacher Resource* in digital format. In this case, electronic “bookmarks” allow you to access the sections quickly and easily. The digital format also facilitates printing and copying student pages.

The Program Overview is the first section. Written for you, this section helps you to navigate the materials, offers several graphic organizers and suggested strategies for their use, and shows how the lessons correlate to the Common Core State Standards and the CCSS Traditional Pathway: Geometry content map found in Appendix A of the Common Core State Standards.

The remaining materials focus on content, knowledge, and application of the units in the CCSS Traditional Pathway: Geometry curriculum: Congruence, Proof, and Constructions; Similarity, Proof,

PROGRAM OVERVIEW

Introduction to the Program

and Trigonometry; Extending to Three Dimensions; Connecting Algebra and Geometry Through Coordinates; Circles With and Without Coordinates; and Applications of Probability. The units in the *CCSS Traditional Pathway: Geometry Program* are designed to be flexible so that you can mix and match activities as the needs of your students and your instructional style dictate.

The Station Activities correspond to the content in the units and provide students with the opportunity to apply concepts and skills, while you have a chance to circulate, observe, speak to individuals and small groups, and informally assess and plan.

Each lesson begins with a pre-assessment and ends with a progress assessment. These allow you to assess students' progress as you move from lesson to lesson, enabling you to gauge how well students have understood the material and to differentiate as appropriate.

Glossary

The Glossary contains vocabulary terms and formulas from throughout the program, organized alphabetically. Each listing provides the term and the definition in both English and Spanish.

PROGRAM OVERVIEW

Unit Structure

All of the instructional units have common features. Each unit begins with a list of all the standards addressed in the topics and a list of one or more conceptual activities. Each unit also begins with a pre-assessment. Each topic begins with an overview of the standards addressed in the topic; Essential Questions; vocabulary (titled “Words to Know”); and a list of recommended websites to be used as additional resources.

Each lesson begins with a list of identified prerequisite skills that students need to have mastered in order to be successful with the new material in the upcoming lesson. This is followed by an introduction, key concepts, common errors/misconceptions, scaffolded practice problems, guided practice examples, a problem-based task with coaching questions and sample responses, a closure activity, and practice. Each topic ends with a progress assessment to evaluate students’ learning.

All of the components are described below and on the following pages for your reference.

Pre-Assessment

This can be used to gauge students’ prior knowledge and to inform instructional planning.

Common Core State Standards for the Topic

All standards that are addressed in the entire topic are listed.

Essential Questions

These are intended to guide students’ thinking as they proceed through the topic. By the end of each topic, students should be able to respond to the questions.

Words to Know

Vocabulary terms and formulas are provided as background information for instruction or to review key concepts that are addressed in the topic.

Recommended Resources

This is a list of websites that can be used as additional resources. Some websites are games; others provide additional examples and/or explanations. (*Note:* Links will be monitored and repaired or replaced as necessary.) Each Recommended Resource is also accessible through Walch’s cloud-based Curriculum Engine Learning Object Repository as a separate learning object that can be assigned to students.

PROGRAM OVERVIEW

Unit Structure

Conceptual Activities

Conceptual understanding serves as the foundation on which to build deeper understanding of mathematics. In an effort to build conceptual understanding of mathematical ideas and to provide more than procedural fluency and application, links to interactive open education and Desmos resources are included. (*Note:* These website links will be monitored and repaired or replaced as necessary.) These and many other open educational resources (OERs) are also accessible through the Learning Object Repository as separate objects that can be assigned to students.

Warm-Up

Each warm-up takes approximately 5 minutes and addresses either prerequisite and critical-thinking skills or previously taught math concepts.

Common Core State Standards for the Lesson

When topics are broken down into lessons, the specific standard or standards that are addressed are presented at the beginning of the instructional portion of the lesson.

Warm-Up Debrief

Each debrief provides the answers to the warm-up questions, and offers suggestions for situations in which students might have difficulties. A section titled Connection to the Lesson is also included in the debrief to help answer students' questions about the relevance of the particular warm-up activity to the upcoming instruction. Warm-Ups with debriefs are also provided in PowerPoint presentations.

Identified Prerequisite Skills

This list cites the skills necessary to be successful with the new material.

Introduction

This brief paragraph gives a description of the concepts about to be presented and often contains some Words to Know.

Key Concepts

Provided in bulleted form, this instruction highlights the important ideas and/or processes for meeting the standard.

Graphing Calculator Directions

Step-by-step instructions for using a TI-Nspire and a TI-83/84 are provided whenever graphing calculators are referenced.

PROGRAM OVERVIEW

Unit Structure

Common Errors/Misconceptions

This is a list of the common errors students make when applying Key Concepts. This list suggests what to watch for when students arrive at an incorrect answer or are struggling with solving the problems.

Scaffolded Practice (Printable Practice)

This set of 10 printable practice problems provides introductory level skill practice for the lesson. This practice set can be used during instruction time.

Guided Practice

This section provides step-by-step examples of applying the Key Concepts. The three to five examples are intended to aid during initial instruction, but are also for individuals needing additional instruction and/or for use during review and test preparation.

Enhanced Instructional PowerPoint (Presentation)

Each lesson includes an instructional PowerPoint presentation with the following components: Warm-Up, Key Concepts, and Guided Practice. Selected Guided Practice examples include GeoGebra applets. These instructional PowerPoints are downloadable and editable.

Problem-Based Task

This activity can serve as the centerpiece of a problem-based lesson, or it can be used to walk students through the application of the standard, prior to traditional instruction or at the end of instruction. The task makes use of critical-thinking skills.

Optional Problem-Based Task Coaching Questions with Sample Responses

These questions scaffold the task and guide students to solving the problem(s) presented in the task. They should be used at the discretion of the teacher for students requiring additional support. The Coaching Questions are followed by answers and suggested appropriate responses to the coaching questions. In some cases answers may vary, but a sample answer is given for each question.

Recommended Closure Activity

Students are given the opportunity to synthesize and reflect on the lesson through a journal entry or discussion of one or more of the Essential Questions.

PROGRAM OVERVIEW

Unit Structure

Problem-Based Task Implementation Guide

This instructional overview, found with selected Problem-Based Tasks in each unit, highlights connections between the task and the lesson's key concepts and Mathematical Practices. The Implementation Guide also offers suggestions for facilitating and monitoring, and provides alternative solutions.

Printable Practice (Sets A and B) and Interactive Practice (Set A)

Each lesson includes two sets of practice problems to support students' achievement of the learning objectives. They can be used in any combination of teacher-led instruction, cooperative learning, or independent application of knowledge. Each Practice A is also available as an interactive Learnosity activity with Technology-Enhanced Items.

Progress Assessment

Each lesson ends with 10 multiple-choice questions, as well as one extended-response question that incorporates critical thinking and writing components. This can be used to document the extent to which students grasp the concepts and skills addressed during instruction.

Unit Assessment

Each unit ends with 12 multiple-choice questions and three extended-response questions that incorporate critical thinking and writing components. This can be used to document the extent to which students grasped the concepts and skills of each unit.

Answer Key

Answers for all of the Warm-Ups and practice problems are provided at the end of each unit.

Station Activities

Most units include a collection of station-based activities to provide students with opportunities to practice, reinforce, and apply mathematical skills and concepts. The debriefing discussions after each set of activities provide an important opportunity to help students reflect on their experiences and synthesize their thinking.

Conceptual Tasks

These engaging tasks provide opportunities for students to deepen their understanding and develop their conceptual knowledge of math concepts. These tasks provide multiple entry points and are accessible for ALL learners.

PROGRAM OVERVIEW

Standards Correlations

Each lesson in the *CCSS Geometry* program was written specifically to address the Common Core State Standards. Each lesson lists the standards covered in all the lessons, and each lesson lists the standards addressed in that particular section. In this section, you'll find a comprehensive list mapping the lessons to the CCSS.

Guide to Common Core State Standards Annotation

As you use this program, you will come across a symbol included with the Common Core standards for some of the lessons and activities. The description of the star symbol is found below, taken verbatim from the Common Core State Standards Initiative website, at www.corestandards.org.

Symbol: ★

Denotes: Modeling Standards

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. Specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

From <http://www.walch.com/CCSS/00006>

Symbol: (+)

Denotes: College and Career Readiness Standards

Advanced mathematics standards that are required in higher-level courses such as advanced statistics may also be included in lower-level courses. These additional standards are denoted by (+). According to the Common Core State Standards Initiative, “the evidence concerning college and career readiness shows clearly that the knowledge, skills, and practices important for readiness include a great deal of mathematics prior to the boundary defined by (+) symbols in these standards. Indeed, some of the highest priority content for college and career readiness comes from Grades 6–8.”

From <http://www.walch.com/CCSS/00004>

Connections to Future Courses

This section provides a map between topics introduced in each unit of this course and subsequent courses where each topic is revisited and built upon.

PROGRAM OVERVIEW

Standards Correlations

Topic	Lesson number	Title	Standard(s)
Unit 1: Congruence, Proof, and Constructions			
Topic A	Introducing Transformations		
	1.1	Defining Terms	G.CO.A.1
	1.2	Transformations As Functions	G.CO.A.2
	1.3	Applying Lines of Symmetry	G.CO.A.3
Topic B	Rotations, Reflections, and Translations		
	1.4	Defining Rotations, Reflections, and Translations	G.CO.A.4
	1.5	Applying Rotations, Reflections, and Translations	G.CO.A.5
Topic C	Exploring Congruence		
	1.6	Describing Rigid Motions and Predicting the Effects	G.CO.B.6
	1.7	Defining Congruence in Terms of Rigid Motions	G.CO.B.6
Topic D	Congruent Triangles		
	1.8	Triangle Congruency	G.CO.B.7
	1.9	Explaining ASA, SAS, SSS, AAS, and HL	G.CO.B.8
Topic E	Proving Theorems About Lines and Angles		
	1.10	Proving the Vertical Angles Theorem	G.CO.C.9
	1.11	Proving Theorems About Angles in Parallel Lines Cut by a Transversal	G.CO.C.9
Topic F	Proving Theorems About Triangles		
	1.12	Proving the Interior Angle Sum Theorem	G.CO.C.10
	1.13	Proving Theorems About Isosceles Triangles	G.CO.C.10
	1.14	Proving the Midsegment of a Triangle	G.CO.C.10
	1.15	Proving Centers of Triangles	G.CO.C.10
Topic G	Proving Theorems About Parallelograms		
	1.16	Proving Properties of Parallelograms	G.CO.C.11
	1.17	Proving Properties of Special Quadrilaterals	G.CO.C.11
Topic H	Constructing Lines, Segments, and Angles		
	1.18	Copying Segments and Angles	G.CO.D.12
	1.19	Bisecting Segments and Angles	G.CO.D.12
	1.20	Constructing Perpendicular and Parallel Lines	G.CO.D.12

PROGRAM OVERVIEW

Standards Correlations

Topic	Lesson number	Title	Standard(s)
Topic I	Constructing Polygons		
	1.21	Constructing Equilateral Triangles Inscribed in Circles	G.CO.D.13
	1.22	Constructing Squares Inscribed in Circles	G.CO.D.13
	1.23	Constructing Regular Hexagons Inscribed in Circles	G.CO.D.13
Unit 2: Similarity, Proof, and Trigonometry			
Topic A	Investigating Properties of Dilations		
	2.1	Investigating Properties of Parallelism and the Center	G.SRT.A.1a
	2.2	Investigating Scale Factors	G.SRT.A.1b
Topic B	Defining and Applying Similarity		
	2.3	Defining Similarity	G.SRT.A.2
	2.4	Applying Similarity Using the Angle-Angle (AA) Criterion	G.SRT.A.3
Topic C	Proving Similarity		
	2.5	Proving Triangle Similarity Using Side-Angle-Side (SAS) and Side-Side-Side (SSS) Similarity	G.SRT.B.4
	2.6	Working with Ratio Segments	G.SRT.B.4
	2.7	Proving the Pythagorean Theorem Using Similarity	G.SRT.B.4
	2.8	Solving Problems Using Similarity and Congruence	G.SRT.B.5
Topic D	Exploring Trigonometric Ratios		
	2.9	Defining Trigonometric Ratios	G.SRT.C.6
	2.10	Exploring Sine and Cosine As Complements	G.SRT.C.7
Topic E	Applying Trigonometric Ratios		
	2.11	Calculating Sine, Cosine, and Tangent	G.SRT.C.8★
	2.12	Calculating Cosecant, Secant, and Cotangent	G.SRT.C.8★
	2.13	Problem Solving with the Pythagorean Theorem and Trigonometry	G.SRT.C.8★
Topic F	Trigonometry of General Angles		
	2.14	Proving the Law of Sines	G.SRT.D.9 (+) G.SRT.D.10 (+)
	2.15	Proving the Law of Cosines	G.SRT.D.10 (+)
	2.16	Applying the Laws of Sines and Cosines	G.SRT.D.11 (+)
Topic G	Trigonometric Modeling		
	2.17	Density	G.MG.A.2★
	2.18	Design	G.MG.A.3★

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Standards Correlations

Topic	Lesson number	Title	Standard(s)
Unit 3: Extending to Three Dimensions			
Topic A	Explaining and Applying Area and Volume Formulas		
	3.1	Circumference and Area of a Circle	G.GMD.A.1
	3.2	Volumes of Cylinders, Pyramids, Cones, and Spheres	G.GMD.A.1 G.GMD.A.3★
Topic B	Two-Dimensional Cross Sections of Three-Dimensional Objects		
	3.3	Two-Dimensional Cross Sections of Three-Dimensional Objects	G.GMD.B.4 G.MG.A.1★
Unit 4: Connecting Algebra and Geometry Through Coordinates			
Topic A	Slope and Distance		
	4.1	Using Coordinates to Prove Geometric Theorems with Slope and Distance	G.GPE.B.4 G.GPE.B.5
	4.2	Working with Parallel and Perpendicular Lines	G.GPE.B.5
Topic B	Points on Line Segments		
	4.3	Midpoints and Other Points on Line Segments	G.GPE.B.6
Topic C	Calculating Perimeter and Area		
	4.4	Calculating Perimeter and Area	G.GPE.B.7★
Topic D	Defining Parabolas Geometrically		
	4.5	Deriving the Equation of a Parabola	G.GPE.A.2
	4.6	Using Coordinates to Prove Geometric Theorems About Parabolas	G.GPE.B.4
Unit 5: Circles With and Without Coordinates			
Topic A	Introducing Circles		
	5.1	Similar Circles and Central and Inscribed Angles	G.C.A.1 G.C.A.2
	5.2	Chord Central Angles Conjecture	G.C.A.2
	5.3	Properties of Tangents of a Circle	G.C.A.2
Topic B	Inscribed Polygons and Circumscribed Triangles		
	5.4	Constructing Inscribed Circles	G.C.A.3
	5.5	Constructing Circumscribed Circles	G.C.A.3
	5.6	Proving Properties of Inscribed Quadrilaterals	G.C.A.3
Topic C	Constructing Tangent Lines		
	5.7	Constructing Tangent Lines	G.C.A.4 (+)

PROGRAM OVERVIEW

Standards Correlations

Topic	Lesson number	Title	Standard(s)
Topic D	Finding Arc Lengths and Areas of Sectors		
	5.8	Defining Radians	G.C.B.5
	5.9	Deriving the Formula for the Area of a Sector	G.C.B.5
Topic E	The Equation of a Circle		
	5.10	Deriving the Equation of a Circle	G.GPE.A.1
	5.11	Using Coordinates to Prove Geometric Theorems About Circles	G.GPE.B.4
Topic F	Geometric Modeling with Circles		
	5.12	Modeling with Circles	G.MG.A.1
Unit 6: Applications of Probability			
Topic A	Events		
	6.1	Describing Events	S.CP.A.1★
	6.2	The Addition Rule	S.CP.C.7★
	6.3	Understanding Independent Events	S.CP.A.2★
Topic B	Conditional Probability		
	6.4	Introducing Conditional Probability	S.CP.A.3★ S.CP.B.5★ S.CP.B.6★
	6.5	Using Two-Way Frequency Tables	S.CP.A.4★ S.CP.B.5★ S.CP.B.6★
	6.6	The Multiplication Rule	S.CP.C.8★ (+)
	Combinatorics		
Topic C	6.7	Combinations and Permutations	S.CP.C.9★ (+)
	6.8	Probability with Combinatorics	S.CP.C.9★ (+)
Topic D	Making and Analyzing Decisions		
	6.9	Making Decisions	S.MD.B.6★ (+)
	6.10	Analyzing Decisions	S.MD.B.7★ (+)