PUBLIC SCHOOLS OF EDISON TOWNSHIP

OFFICE OF CURRICULUM AND INSTRUCTION

Geometry Honors/Accelerated/Academic

Length of Course:	Term
Elective/Required:	Required
Schools:	High School
Eligibility:	Grade 9-12
Credit Value:	5 Credits
Date Approved:	September 23, 2019

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Statement of Purpose

This course of study has been designed for the Geometry course. The curriculum introduces geometric topics, skills, and concepts. The material should be connected to real-world situations as often as possible, as suggested in the curriculum. This course curriculum guide provides a thorough preparation for geometric questions that may be included on the NJSLA Geometry state assessment.

In order to promote the effective implementation of this program, the following suggestions are provided:

1. Formative assessment should be used throughout this course, as with any math course, in order to monitor students' learning and instruction such be adjusted as needed.

2. Instruction should be differentiated in order to accommodate the different ways students learn.

3. Students should be encouraged to maintain an organized and thorough set of notes in a notebook. Teachers should indicate the expected format and content and should explain how notebooks can be effectively utilized.

4. Meaningful and relevant homework assignments should be given to students on a regular basis to encourage the practice of new skills and concepts.

5. Examples of application of mathematics and specifically Algebra in careers and everyday-life situations should be provided as motivation wherever possible.

6. Students should be required to use correct mathematical terminology at all times.

7. The use of technology is encouraged wherever possible in order to foster the impact on students' learning and understanding.

8. Modifications and accommodations should be included where necessary to meet student's

Individual Education Plans (IEP).

Course Objectives

The student will be able to:

❖ Chapter 1

- Develop an awareness of the structure of a mathematical system, connecting definitions, postulates, logical reasoning, and theorems.
- Use construction to explore attributes of geometric figures and to make conjectures about geometric relationships.
- Use one- and two-dimensional coordinate systems to represent points, lines, rays, line segments, and figures.
- Find areas of regular polygons, circles, and composite figures.

❖ Chapter 2

- Use inductive reasoning to formulate a conjecture.
- Use logical reasoning to prove statements are true and find counterexamples to disprove statements that are false.
- Determine the validity of a conditional statement, its converse, inverse, and contrapositive.
- Use deductive reasoning to prove a statement.

❖ Chapter 3

- Make conjectures about lines and determine the validity of the conjectures.
- Make conjectures about angles and determine the validity of the conjectures.
- Use slopes of equations of lines to investigate geometric relationships, including parallel lines and perpendicular lines.
- Use one- and two-dimensional coordinate systems to represent lines.

❖ Chapter 4

- Make conjectures about polygons.
- Use numeric and geometric patterns to make generalizations about geometric properties.
- Use logical reasoning to prove statements are true.

❖ Chapter 5

- Use slope and equations of lines to investigate geometric relationships, including special segments of triangles.
- Recognize and know the historical development of geometric systems and know that mathematics was developed for a variety of purposes.
- Analyze geometric relationships in order to verify conjectures.

❖ Chapter 6

- Use geometric concepts and properties to solve problems in fields such as art and architecture.
- Identify and apply mathematics to everyday experience, to activities in and outside of school, with other disciplines, and with other mathematical topics.
- Communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.

❖ Chapter 7

- Use ratios to solve problems involving similar figures.
- Formulate and test conjectures about the properties and attributes of polygons and their component parts based on explorations and concrete models.

❖ Chapter 8

- Use and extend similarity properties to explore and justify conjectures about geometric figures.
- Derive, extend, and use the Pythagorean Theorem.
- Identify and apply patterns from right triangles to solve meaningful problems, including special right triangles (45°-45°-90° and 30°-60°-90°) and triangles with sides that are Pythagorean triples.
- Develop, apply, and justify triangle similarity relationships, such as trigonometric ratios using a variety of methods.

❖ Chapter 9

- Use congruence transformations to make conjectures and justify the properties of geometric figures.

❖ Chapter 10

- Find areas of sectors and arc lengths of circles using proportional reasoning.
- Use numeric and geometric patterns to make generalizations about geometric properties including properties of angle relationships in circles.

❖ Chapter 11

- Find areas of regular polygons, circles, and composite figures.
- Find areas of sectors and arc lengths of circles using proportional reasoning.

❖ Chapter 12

- Find surface areas and volumes of prisms, pyramids, spheres, cones, cylinders, and composites of these figures.
- Describe the effect on area and volume when one or more dimensions of a figure are changed.

❖ Chapter 13

- Understand sample spaces and design simulations
- Compute probabilities for independent, dependent, mutually exclusive, not mutually exclusive, and conditional events.
- Calculate geometric probabilities.

All objectives will include applications to real-life situations.

For NJSLS visit https://www.nj.gov/education/cccs/2016/math/standards.pdf

INTRODUCTION

The New Jersey Student Learning Standards for Mathematics are intended to provide students with a solid foundation. The Standards for Mathematical Content are a balanced combination of procedure and understanding.

The high school standards are listed in conceptual categories: • Number and Quantity • Algebra • Functions • Modeling • Geometry • Statistics and Probability

Mathematical Practice Standards:
This curriculum guide is standards based which reflects the New Jersey Student Learning Standards for Mathematics, the Mathematical Practices that are expected to be used in teaching mathematics K-12 are as follows and infused throughout the guide:

- Make sense of problems and persevere in solving them.
- Use appropriate tools strategically.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Technology infused within the Curriculum (refer to “Resources: Essential Materials, Supplementary Materials, Links to Best Practices”)
National / International Technology Student Standards
Standard 8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

- Empowered Learner: Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.
- Digital Citizenship: Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.
- Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce
  creative artifacts, and make meaningful learning experiences for themselves and others.

- Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.

Career Ready Practices within the Curriculum (refer to “Activities/Strategies”)
College Ready Practices are practices that have been linked to increase college, career, and life success.

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP11. Use technology to enhance productivity.

Suggested Timeline (Honors)

UNIT	# of PERIODS	Sections
Unit 0: Chapter 0 – Preparing for Geometry	Optional 7 (MP 1)	
Unit 1: Chapter 1 - Tools of Geometry	12 (MP 1)	1.1-1.4, 1.7
Unit 2: Chapter 2 - Reasoning and Proof	8 (MP 1)	Use supplemental material
Unit 3: Chapter 3 - Parallel and Perpendicular Lines	12 (MP 1)	3.1-3.6
Unit 4: Chapter 4 - Congruent Triangles	15 (end MP 1) Start in MP 1 End in MP 2	4.1, 4.3-4.6,4.8
Unit 5: Chapter 5 - Relationships in Triangles	6 (MP 2)	5.1 (angle bisector theorem, equidistant theorem) 5.2 (median, centroid, altitude, orthocenter) 5.3, 5.5

Unit 6: Chapter 6 - Quadrilaterals	15 (MP 2)	6.1-6.6
Unit 7: Chapter 7 - Proportions and Similarity	14 (end MP 2) Complete in MP 2	7.2-7.6
Unit 8: Chapter 8 - Right Triangles/ Trigonometry	27 (MP 3)	8.1-8.5, 8.7
Unit 10: Chapter 10 - Circles	14 (MP 3)	10.1-10.4, 10.8
Unit 9: Chapter 9 - Transformations and Symmetry	4 (MP 4)	9.1-9.6
Unit 11: Chapter 11 - Area of polygons and circles	18 (MP 4)	11.1-11.5
Unit 12: Chapter 12 – Extending Surface Area/ Volume	12 (MP 4)	12.2-12.6

Note - Teachers will adjust their timing and pacing as they feel necessary to accommodate actual class periods available.

Suggested Timeline (Accelerated)

UNIT	# of PERIODS	Sections
Unit 0: Chapter 0 – Preparing for Geometry	6	
Unit 1: Chapter 1 - Tools of Geometry	11	1.1-1.5
Unit 2: Chapter 2 - Reasoning and Proof	14	2.1,2.3-2.8
Unit 3: Chapter 3 - Parallel and Perpendicular Lines	13 (end MP 1)	3.1-3.5
Unit 4: Chapter 4 - Congruent Triangles	13	4.1 (5.5, 8.2), 4.2-4.6
Unit 6: Chapter 6 - Quadrilaterals	14	1.6, 6.1-6.6
Unit 7: Chapter 7 - Proportions and Similarity	13 (end MP 2)	7.1-7.5, 7.7
Unit 8: Chapter 8 - Right Triangles/Trigonometry	15	8.1-8.5
Unit 10: Chapter 10 - Circles	18	10.1-10.8

Unit 9: Chapter 9 - Transformations and Symmetry	5	9.1-9.4, 9.6
Unit 5: Chapter 5 - Relationships in Triangles	7 (end MP 3)	5.1-5.2
Unit 11: Chapter 11 – Area of Polygons and Circles	7	11.1-11.4
Unit 12: Chapter 12 – Extending Surface Area/ Volume	11	1.7, 12.2-12.6
Unit 13: Chapter 13 – Probability and Measurement	10 (optional; end MP4)	

Note - Teachers will adjust their timing and pacing as they feel necessary to accommodate actual class periods available.

Suggested Timeline (Academic)

UNIT	# of PERIODS	Sections
Unit 0: Chapter 0 – Preparing for Geometry	2	
Unit 1: Chapter 1 - Tools of Geometry	17	1.1,1.2 with 2.7,1.4 with 2.8 ,1.5
Unit 2: Chapter 2 - Reasoning and Proof	8	2.1,2.3, 2.5-2.8
Unit 3: Chapter 3 - Parallel and Perpendicular Lines	14 (end MP 1)	3.1-3.5 (include 1.3)
Unit 4: Chapter 4 - Congruent Triangles	14	4.1 (8.2), 4.2-4.6
Unit 7: Chapter 7 – Proportions and Similarity	10	7.1 – 7.4
Unit 6: Chapter 6 - Quadrilaterals	14 (end MP 2)	6.1 – 6.6
Unit 8: Chapter 8 - Right Triangles/Trigonometry	17	Radicals review, 8.1-8.5
Unit 9: Chapter 9 - Transformations and Symmetry	8	9.1-9.4, 9.6
Unit 10: Chapter 10 - Circles	18 (end MP 3)	10.1-10.8

Unit 5: Chapter 5 - Relationships in Triangles	12	5.1-5.3, 5.5-5.6
Unit 11: Chapter 11 – Area of Polygons and Circles	12	11.1-11.4
Unit 12: Chapter 12 – Extending Surface Area/ Volume	8 (end MP 4)	1.7, 12.2-12.6

Note - Teachers will adjust their timing and pacing as they feel necessary to accommodate actual class periods available.

Unit Title: Chapter 0 Preparing For Geometry

Targeted Standards:
Unit Objectives/Conceptual Understandings: The concepts presented in Chapter 0 are review from previous courses. You may wish to use all or some of the chapter at the beginning of the school year to refresh students' skills. Or you may wish to begin with Chapter 1 and use the Chapter 0 lessons as needed to reinforce prerequisite skills as you progress through the program.
Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/ Interdisciplinary Connections	**Assessment Check Points**
CC.9-12.S.CP.1 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) CC.9-12.A.CED.4* Students extend their work with algebraic properties and solving equations in one variable to solving literal equations for a given variable. CC.9-12.A.REI.3 CC.9-12.A.CED.1* Students have written and solved linear equations in one variable. Now they extend this work to inequalities. The methods for solving inequalities are very similar to the methods for	Unit vocabulary including: a. experiment b. trial c. outcome d. event e. probability f. theoretical probability g. experimental probability h. ordered pair i. *x*-coordinate j. *y*-coordinate k. quadrant l. origin m. system of equations n. substitution o. elimination p. Product Property q. Quotient Property	Convert units of measure within the customary and metric systems. Convert units of measure between the customary and metric systems. Find the probability of simple events. Use the order of operations to evaluate algebraic expressions. Use algebra to solve linear equations. Use algebra to solve linear inequalities. Name and graph points in the coordinate plane.		Use pretest and posttest provided in the text

solving equations; many students strengthen their understanding by studying both. As with equations, students will create and use inequalities to solve problems in contextual situations. CC.9-12.A.CED.2* CC.9-12.A.REI.6 Students have seen that the relationship between two or more variables can be represented as an equation or inequality and as a graph. Understanding equivalent representations and fluently translating between them are important for solving problems. For example, the connection between an equation and its graph is key to understanding how to use a graph to solve a system of equations.		Use graphing, substitution, and elimination to solve systems of linear equations. Evaluate square roots and simplify radical expressions.		
Resources: Essential Materials, Supplementary Materials, Links to Best Practices, Leveled Worksheets, Personal Tutor, Virtual Manipulatives, 5-Minute Checks, Graphing Calculator			**Instructional Adjustments:** Leveled Worksheets, Differentiation Resources, Scaffolding Questions	

Unit Title: Chapter 1 Tools of Geometry

Targeted Standards: G.CO Experiment with transformations in the plane. G.GMD Explain volume formulas and use them to solve problems. G.MG Apply geometric concepts in modeling situations. G.GPE Translate between the geometric description and the equation for a conic section.

Unit Objectives/Conceptual Understandings: Students will be able to: Develop an awareness of the structure of a mathematical system, connecting definitions, postulates, logical reasoning and theorems. Use construction to explore attributes of geometric figures to make conjectures about geometric relationships. Use one and two dimensional coordinate systems to represent points, lines, rays, line segments, and figures. Find areas of regular polygons, circles, and composite figures.

Essential Questions: Why do we measure?

Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/ Interdisciplinary Connections	**Assessment Check Points**
G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. G.CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). G.MG.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	Unit vocabulary including: a. collinear b. coplanar c. congruent d. midpoint e. segment bisector f. angle g. vertex h. angle bisector i. perpendicular j. polygon k. perimeter l. volume Identify and model points, lines, and planes. Identify intersecting lines and planes. Measure segments. Calculate with measures. Find the distance between two points. Find the midpoint of a segment.	Identify and model points, lines, and planes. Identify intersecting lines and planes. Measure segments. Calculate with measures. Find the distance between two points. Find the midpoint of a segment. Measure and classify angles. Identify and use congruent angles and the bisector of an angle.	• Challenge students to develop three-dimensional models to demonstrate difficult geometric concepts related to points, lines, and planes. Some examples include: • Develop a model to show that three points can be noncollinear. • Develop a demonstration to show that three points are coplanar, but four points can be noncoplanar. • Develop a three-dimensional model of lines that are not parallel and do not intersect. Have students sketch three different segments that each have (0, 0) as a midpoint. Write	Use formative assessments suggested in the textbook. Use Guided Practice, Check Your Understanding, HOT problems, and Spiral Reviews as needed. Use Ticket Out the Door Section 1.2 and 1.6. Use Mid-Chapter Quiz Lesson 1.1-1.4 p 45. Use Self-Check Quizzes as needed.

G.GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula. G.GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. Visualize relationships between two-dimensional and three-dimensional objects.	Measure and classify angles. Identify and use congruent angles and the bisector of an angle. Identify and use special pairs of angles. Identify perpendicular lines. Identify and name polygons. Find perimeter or circumference and area of two-dimensional figures. Identify and name three-dimensional figures. Find surface area and volume.	Identify and use special pairs of angles. Identify perpendicular lines. Identify and name polygons. Find perimeter, circumference, and area of two-dimensional figures. Identify and name three-dimensional figures. Find surface area and volume.	the coordinates of the endpoints of each segment. What do you notice about the coordinates? Have students list each angle relationship presented in the Key Concept boxes of this lesson on pages 46–49. Then, have students write one or two sentences to describe each relationship and provide an example. When discussing surface area, provide students with the opportunity to make nets, cut them out, and then put them together to make a solid. This should help them better understand surface area.	
Resources: Leveled Worksheets, Personal Tutor, Virtual Manipulatives, 5-Minute Checks found on connect.ED.mcgraw-hill.com Geometer's Sketchpad Graphing Calculator Teaching Geometry with Manipulatives			**Instructional Adjustments:** Use Leveled Worksheets. Use Lesson Resources to provide differentiation. Use scaffolding questions provided at the start of each lesson. Use error analysis and Watch Out tips suggested in the textbook. Use Tip for New Teachers suggested in the textbook.	

Unit Title: Chapter 2 Reasoning and Proof

Targeted Standards: G.CO Prove geometric theorems. G.MG Apply geometric concepts in modeling situations.
Unit Objectives/Conceptual Understandings: Students will be able to: Use inductive reasoning to formulate a conjecture. Use logical reasoning to prove statements are true and find counterexamples to disprove statements that are false. Determine the validity of a conditional statement, its converse, inverse, and contrapositive. Use deductive reasoning to prove a statement.
Essential Questions: Why is it important to be able to think logically?
Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/ Interdisciplinary Connections	**Assessment Check Points**
G.CO.9 Prove theorems about lines and angles. G.CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). G.MG.3 Apply geometric methods to solve problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	Unit vocabulary including: a. inductive reasoning b. conjecture c. counterexample d. negation e. if-then statement f. hypothesis g. conclusion h. converse i. inverse j. postulate k. proof l. theorem Use logic to find counterexamples and use inductive reasoning to formulate a conjecture. Develop an awareness of the structure of a mathematical system, connecting definitions, postulates, and logical reasoning. Use logical reasoning to prove statements are true. Analyze statements in if-then form. Write the converse, inverse,	Make conjectures based on inductive reasoning. Find counterexamples. Determine truth values of negations, conjunctions, and disjunctions and represent them using Venn diagrams. Analyze statements in if-then form. Write converses, inverses, and contrapositives. Use the Law of Detachment. Use the Law of Syllogism. Identify and use basic postulates about points, lines, and planes.	Organize students into small groups. Each student should come up with at least two statements that are not always true and the other students in the group should find the counterexamples. • If students have difficulty understanding the truth value of conditional statements, then have students determine what type of conditional statements are never true. Have them analyze truth tables for conditional statements and find concrete examples where the hypothesis is always true and the	Use formative assessments suggested in the textbook. Use Guided Practice, Check Your Understanding, HOT problems, and Spiral Reviews as needed. Use Ticket Out the Door Section 2.1 and 2.8. Use Mid-Chapter Quiz Lesson 2.1-2.5 p 135. Use Self-Check Quizzes as needed.

	and contrapositive of if-then statements. Learn to use the Law of Detachment and the Law of Syllogism. Use deductive reasoning to prove a statement. Construct and justify statements about geometric figures, using basic postulates and paragraph proofs. Use algebra to write two-column proofs and use the properties of equality to write geometric proofs. Write proofs involving segment addition and segment congruence. Write proofs involving supplementary and complementary angles. Write proofs involving congruent and right angles. Use deductive reasoning to prove a statement.	Write paragraph proofs. Use algebra to write two-column proofs. Use properties of equality to write geometric proofs. Write proofs involving segment addition. Write proofs involving congruence. Write proofs involving supplementary and complementary angles. Write proofs involving congruent and right angles.	conclusion is always false. Provide students with algebraic and geometric proofs that are missing the justifications for each step. At least one proof should contain errors. Have students fill in the justifications and explain the errors.	
Resources: Leveled Worksheets, Personal Tutor, Virtual Manipulatives, 5-Minute Checks found on connect.ED.mcgraw-hill.com Geometer's Sketchpad Graphing Calculator Teaching Geometry with Manipulatives			**Instructional Adjustments:** Use Leveled Worksheets. Use Lesson Resources to provide differentiation. Use scaffolding questions provided at the start of each lesson. Use error analysis and Watch Out tips suggested in the textbook. Use Tip for New Teachers suggested in the textbook.	

Unit Title: Chapter 3 Parallel and Perpendicular Lines

Targeted Standards: G.CO Experiment with transformations in the plane. G.MG Apply geometric concepts in modeling situations. G.GPE Translate between the geometric description and the equation for a conic section.

Unit Objectives/Conceptual Understandings: Students will be able to: Make conjectures about lines and determine the validity of the conjectures. Use construction to explore attributes of geometric figures to make conjectures about geometric relationships. Make conjectures about angles and determine the validity of the conjectures. Find areas of regular polygons, circles, and composite figures. Use slopes of equations of lines to investigate geometric relationships, including parallel lines and perpendicular lines. Use one- and two-dimensional coordinate systems to represent lines.

Essential Questions: Why do we have undefined terms such as *point* and *line*? How can we use undefined terms?

Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/ Interdisciplinary Connections	**Assessment Check Points**
G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. G.CO.9 Prove theorems about lines and angles. G.CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). G.MG.3 Apply geometric methods to solve problems (e.g., designing an object or structure to satisfy physical	Unit vocabulary including: ● a. parallel lines b. skew lines c. parallel planes d. transversal e. interior angles f. exterior angles g. corresponding angle h. slope i. rate of change j. slope-intercept form k. point-slope form l. equidistant ● Identify relationships between two lines or two planes. Name angle pairs formed by parallel lines and transversals. Use theorems to determine the relationships between specific pairs of angles. Use	Identify the relationship between two lines or two planes. Name angle pairs formed by parallel lines and transversals. Identify the relationships between two lines or planes. Name angle pairs formed by parallel lines and transversals. Use properties of parallel lines to determine congruent angles. Graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and *y*-intercept. Recognize the angle relationships that occur when parallel lines are cut by a transversal.	Use masking tape to mark two parallel lines and a transversal on the floor. Have pairs of students stand in angles that are congruent or supplementary, and have them explain whether their angles are alternate interior, alternate exterior, corresponding, or consecutive interior angles. Have students graph $y = x^2$ on a coordinate plane. They can use a graphing calculator to generate the graph. Explain that a tangent line intersects the graph in one place. Have them predict where the tangent line of their function will be located. Have them sketch the line and predict the slope of the line. Explain to students that they will learn more about tangent lines to functions as they begin their study of calculus.	Use formative assessments suggested in the textbook. Use Guided Practice, Check Your Understanding, HOT problems, and Spiral Reviews as needed. Use Ticket Out the Door Section 3.1 and 3.5. Use Mid-Chapter Quiz Lesson 3.1-3.3 p 197. Use Self-Check Quizzes as needed.

constraints or minimize cost; working with typographic grid systems based on ratios). G.GPE.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	algebra to find angle measurements. Find slopes of lines. Use slope to identify parallel and perpendicular lines. Write an equation of a line given information about the graph. Solve problems by writing equations. Recognize the angle relationships that occur when parallel lines are cut by a transversal. Use angle relationships to prove that lines are parallel. Find the distance between a point and a line. Find the distance between two parallel lines.	Use angle relationships to prove that lines are parallel. Use angle relationships to prove that two lines are parallel.	Instruct students to draw two lines cut by a transversal with given specific angle measure criteria. The students may work together in small groups of 3 or 4 to discuss whether the lines must be parallel. Facilitate the discussions so that students discern that more angle measures can be found with certainty when the lines are parallel than when the lines are not parallel.	
Resources: Leveled Worksheets, Personal Tutor, Virtual Manipulatives, 5-Minute Checks found on connect.ED.mcgraw-hill.com Geometer's Sketchpad Graphing Calculator Teaching Geometry with Manipulatives			**Instructional Adjustments:** Use Leveled Worksheets. Use Lesson Resources to provide differentiation. Use scaffolding questions provided at the start of each lesson. Use error analysis and Watch Out tips suggested in the textbook. Use Tip for New Teachers suggested in the textbook.	

Unit Title: Chapter 4 Congruent Triangles

Targeted Standards: G.CO Experiment with transformations in the plane. **G.SRT** Understand similarity in terms of similarity transformations **G.GPE** Translate between the geometric description and the equation for a conic section.
Unit Objectives/Conceptual Understandings: Make conjectures about polygons. Use numeric and geometric patterns to make generalizations about geometric properties. Use logical reasoning to prove statements are true.
Essential Questions: How can you compare two objects? How can you tell if two objects are congruent? How can you tell if two triangles are congruent?
Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/ Interdisciplinary Connections	**Assessment Check Points**
G.CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. G.CO.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	Unit vocabulary including: a. equiangular triangle b. equilateral triangle c. isosceles triangle d. scalene triangle e. auxiliary line f. congruent g. congruent polygons h. corresponding parts i. included angle j. included side k. base angle l. transformation m. preimage n. image o. reflection p. translation q. rotation	Identify and classify triangles by angle measures and side measures. Apply the Triangle Angle-Sum Theorem and the Exterior Angle Theorem. Name and use corresponding parts of congruent triangles. Prove triangles congruent using the definition of congruence. Use the SSS and SAS Postulates to test for triangle congruence. Use the ASA and AAS Postulates to test for triangle congruence.	**Interpersonal** Students work in groups of 2 or 3 to explore the triangle classifications. Ask students to explore and discuss questions such as these: Can you draw an equiangular triangle with a 90° angle? Can you draw a right triangle that has an obtuse angle? Facilitate the discussions so that students discover which triangle classifications are mutually exclusive and which are not **Multiple Representations** In Exercise 45, students investigate the sum of the measures of the exterior angles of a triangle using geometric sketches, a table, a verbal description, and a paragraph proof. **Extension** Have students draw ΔABC with vertices $A(-8, 8)$, $B(-2, 5)$, and $C(-8, 2)$. Next, have students draw ΔPTS with vertices $P(8, 8)$, $T(2, 5)$, and $S(8, 2)$. Ask students how they can	Suggested quiz after section 4.4 Exit tickets provided in text Teacher-generated exit tickets Suggested quiz after section 4.6 Teacher-generated formative/summative assessment

G.CO.7 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. G.CO.10 Prove theorems about triangles. G.CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). G.SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. G.GPE.4 Use coordinates to prove simple geometric theorems algebraically.	Triangle Angle Sum Theorem Properties of Triangle Congruence Triangle Congruence Postulates: SSS, SAS, ASA, AAS, HL Isosceles Triangle Theorem Coordinate Proof	Use properties of isosceles and equilateral triangles. Identify reflections, translations, and rotations. Verify congruence after a congruence transformation. Position and label triangles for use in coordinate proofs. Write coordinate proofs.	verify that the corresponding sides of the triangles are congruent. Further, facilitate discussion about whether the corresponding angles of Δ*ABC* and Δ*PTS* are congruent. Students can use the distance formula to prove that corresponding sides are congruent. Further discussion about the angles may include suggestions that the triangles are exactly the same because one is a reflection of the other, or that the equal side lengths require equal angles. **Extension** Rotations, reflections, and translations are used to create many works of art. Have students explore using these transformations to create patterns. Students should begin with a single figure in the coordinate plane and use various transformations to turn their figure into an artful pattern. Students should record each pattern used so that the design can be repeated.	
Resources: Essential Materials, Supplementary Materials, Links to Best Practices, Leveled Worksheets, Personal Tutor, Virtual Manipulatives, 5-Minute Checks, Graphing Calculator			**Instructional Adjustments:** Leveled Worksheets, Differentiation Resources, Scaffolding Questions, Use “Watch Out” questions provided in the text	

Unit Title: Chapter 5 Relationships in Triangles

Targeted Standards: G.CO – Prove theorems about triangles and apply geometric methods to solve problems
Unit Objectives/Conceptual Understandings: Students will be able to identify and use perpendicular bisectors, angle bisectors, medians and altitudes in triangles, and recognize and apply properties of inequalities to angles and sides of triangles.
Essential Questions: What information do we get from knowing that a segment is a median, altitude or angle bisector of a triangle? What inequalities apply to the relationships between angles and sides in triangles?
Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives	**Instructional Actions**

Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/Interdisciplinary Connections	**Assessment Check Points**
G.CO.10 Prove theorems about triangles G.MG.3 Apply geometric methods to solve problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios)	Unit vocabulary including: a. perpendicular bisector b. point of concurrency c. circumcenter d. incenter e. median f. centroid g. altitude h. orthocenter Exterior Angle Inequality Angle-Side Inequalities The Triangle Inequality Hinge Theorem	Construct viable arguments Use perpendicular bisectors in triangles Use angle bisectors in triangles Use medians in triangles Use altitudes in triangles Write indirect proofs Use The Triangle Inequality to identify possible triangles Use the Hinge Theorem to make comparisons in two triangles	Use Real-World Example 2 on Pg 326 to connect the Circumcenter Theorem to real-life problems Use Interior Design Example on Pg 347 to connect Angle-Side Relationships to the real world Use the Cabri Jr. application on a TI-83/84 Plus graphing calculator to discover properties of triangles as outlined on Pg 363	Suggest quizzes after Sec 5.2 and 5.5 Use Exit Ticket included in Sec 5.2 Selected exercises can be used as Formative Assessments as suggested in the textbook

Resources: Leveled Worksheets, Personal Tutor, Virtual Manipulatives, 5-Minute Checks Use graphing calculator Teaching Geometry with Manipulatives	**Instructional Adjustments:** Use Leveled Worksheets Use Lesson Resources to provide differentiation Use scaffolding questions provided at the start of each lesson

Unit Title: Chapter 6 Quadrilaterals

Targeted Standards: G.CO and G.MG – Prove theorems about parallelograms, apply geometric methods to solve problems, use coordinates to prove geometric theorems
Unit Objectives/Conceptual Understandings: Students will recognize properties of quadrilaterals that determine the most descriptive quadrilateral and apply properties of polygons to solve problems
Essential Questions: What properties determine a parallelogram and/or special parallelograms?
Unit Assessment: Teacher-generated assessments will be used

	Core Content Objectives	**Instructional Actions**

Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/Interdisciplinary Connections	**Assessment Check Points**
G.MG.1 – Use geometric shapes, their measures and their properties to describe objects G.CO.11 – Prove theorems about parallelograms G.GPE.4 – Use coordinates to prove simple geometric theorems algebraically G.MG.3 – Apply geometric methods to solve problems	Unit Vocabulary including: a. diagonal b. parallelogram c. rectangle d. rhombus e. square f. trapezoid g. bases h. legs of a trapezoid i. base angles j. isosceles trapezoid k. midsegment of a trapezoid l. kite Properties of: a. parallelogram b. rectangle c. rhombus d. square	Verify that a quadrilateral is a parallelogram Prove that a set of points forms a parallelogram in the coordinate plane Determine whether a parallelogram or a quadrilateral is a rectangle, square or rhombus Apply properties of kites and trapezoids	Consider using the Graphing Technology Lab on Pg 412 Assign the “Modeling” problem (#32) on Pg 427	Consider giving quizzes after Section 6.1, 6.3 and 6.6 Selected exercises can be used as Formative Assessments as suggested in the textbook

	e. trapezoid f. isosceles trapezoid g. kite How to find the sum of the measures of the interior and exterior angles of a polygon			

Resources: Leveled Worksheets, Virtual Manipulatives, Animations, Personal Tutor Graphing calculators Teaching Geometry with Manipulatives	**Instructional Adjustments:** Use Leveled Worksheets Use Lesson Resources to provide differentiation Use scaffolding questions provided at the start of each lesson

Unit Title: Chapter 7 Proportions and Similarity

Targeted Standards: G.SRT – Understand similarity, define trigonometric ratios, and apply trigonometry in problem solving.
Unit Objectives/Conceptual Understandings: Students will be able to identify similar triangles.
Essential Questions: How do we prove that triangles are similar? How can we use proportional relationships in similar triangles to find missing dimensions?
Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives	**Instructional Actions**

Cumulative Progress Indicators	**Concepts** What the student will know.	**Skills** What the student will be able to do.	**Activities/Strategies** Technology Implementation/Interdisciplinary Connections	**Assessment Check Points**
G.MG.3 – Apply geometric methods to solve problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost, working with typographic grid systems based on ratios) G.SRT.2 – Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar, explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. G.SRT.4 – Prove theorems about triangles	Unit vocabulary including: a. ratio b. proportion c. cross products d. similar polygons e. similar ratio f. scale factor g. midsegment of a triangle h. fractal i. iteration j. self-similar k. dilation l. similarity transformation m. scale factor of a dilation n. scale model o. scale drawing p. scale	Prove that triangles are similar Use proportional relationships of corresponding segments of similar triangles to solve problems Use scale factors to solve problems.	Consider doing the Graphing Technology Lab which relates the Fibonacci Sequence and Ratios (Pg 468) The Geometry Lab on Pg 488 uses similar triangles to prove the slope criteria for perpendicular and parallel lines The Geometry Lab on Pg 509 – 510 investigates iteration and fractals	Quizzes are suggested after Section 7.2, 7.4 and 7.6 Selected exercises can be used as Formative Assessments as suggested in the textbook

G.SRT.5 – Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	How to identify similar triangles How to identify similarity transformations			

Resources: Leveled Worksheets, Virtual Manipulatives, Animations, Personal Tutor Graphing calculators to be used with the Lab on Pg 468 Teaching Geometry with Manipulatives	**Instructional Adjustments:** Use Leveled Worksheets Use Lesson Resources to provide differentiation Use scaffolding questions provided at the start of each lesson

Unit Title: Chapter 8 Right Triangles and Trigonometry

Targeted Standards: G.SRT – Solve problems involving right triangles and apply trigonometry to right triangles
Unit Objectives/Conceptual Understandings: Students will be able to solve problems involving right triangles, using Pythagorean Theorem, special right triangles, and trigonometric ratios
Essential Questions: How do we use the Pythagorean Theorem and trigonometric ratios to solve problems
Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What the student will know.	**Skills** What the student will be able to do.	**Activities/Strategies** Technology Implementation/Interdisciplinary Connections	**Assessment Check Points**
G.SRT.4 – Prove theorems about triangles G.SRT.5 – Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures G.SRT.6 – Understand that by similarity, the side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. G.SRT.7 – Explain and use the relationship between the sine and cosine of complementary angles.	Unit vocabulary including: a. Geometric mean b. Pythagorean triple c. Trigonometry d. Trigonometric ratio e. Sine f. Cosine g. Tangent h. Inverse sine i. Inverse cosine j. Inverse tangent k. Cosecant l. Secant m. Cotangent n. Angle of elevation o. Angle of depression p. Law of Sines q. Law of Cosines r. Vector s. Magnitude t. Direction u. Standard position v. Component form	Find the geometric mean between two numbers Solve problems involving relationships between parts of a right triangle and the altitude to the hypotenuse Solve problems using the Pythagorean Theorem and its Converse Use properties of 45-45-90 and 30-60-90 triangles to solve problems Find trigonometric ratios using right triangles	Use the Cabri Jr. application on a graphing calculator to explore trigonometry, the study of the patterns in right triangles Make real life connections by solving problems involving playground (Pg 554 - #44), sports (Pg 573 - #11), roller coasters (Pg 574 - #35), and angles of elevation and depression	Quizzes are provided in Sections 8-2, 8-4, 8-6, and 8-7. Selected exercises can be used as Formative Assessments as suggested in the textbook Use the Exit Ticket suggested in Lesson 8-5 on Pg 587

G.SRT.8 – Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems G.SRT.9 – Derive the formula A = $\frac{1}{2}$ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side. G.SRT.10 – Prove the Laws of Sines and Cosines G.MG.3 – Apply geometric methods to solve problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost, working with typographic grid systems based on ratios). G.GPE.6 - Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	w. Resultant The Pythagorean Theorem and its Converse Common Pythagorean triples The side relationships of 45-45-90 and 30-60-90 triangles	Use trigonometric ratios to find angle measures in right triangles Solve problems involving angles of elevation and depression Use the Law of Sines and the Law of Cosines Perform vector operations		

Resources: Leveled Worksheets, Virtual Manipulatives, Animations, Personal Tutor Graphing calculators to be used with the Lab on Pg 567 Teaching Geometry with Manipulatives	**Instructional Adjustments:** Use Leveled Worksheets Use Lesson Resources to provide differentiation Use scaffolding questions provided at the start of each lesson

Unit Title: Chapter 9 Transformations and Symmetry

Targeted Standards: G.CO Experiment with transformations in the plane. Understand congruence in terms of rigid motions. Prove geometric theorems. G.MD Explain volume formulas and use them to solve problems. G.SRT Understand similarity in terms of similarity transformations.
Unit Objectives/Conceptual Understandings: Students will be able to: Use congruence transformations to make conjectures and justify properties of geometric figures.
Essential Questions: Where can transformations be found? Why is symmetry desirable?
Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/ Interdisciplinary Connections	**Assessment Check Points**
G.CO.2 Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch). G.CO.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. G.CO.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. G.CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	Unit vocabulary including: a. line of reflection b. center of rotation c. angle of rotation d. composition of transformations e. symmetry f. line symmetry g. line of symmetry Draw a reflection in a line of reflection and in the coordinate plane. Draw translations in a plane and in a coordinate plane. Draw reflections in a line and in a coordinate plane. Draw translations in a plane and in the coordinate plane. Verify reflections and translations as	Draw reflections. Draw reflections in the coordinate plane. Draw translations. Draw translations in the coordinate plane. Draw rotations. Draw rotations in the coordinate plane. Explore the effects of performing multiple transformations on a figure. Identify line and rotational symmetries in two-dimensional figures. Identify plane and axis symmetries in three-dimensional figures.	Create three or four large coordinate grids using poster board. Provide several laminated shapes, such as rectangles, hexagons, pentagons, and trapezoids. Students can practice physically translating shapes on the grids. Students can use examples of translations in the lesson or create their own. There are many examples of objects in nature that have symmetry. Have students draw or gather examples of objects in nature for each of the types of symmetry discussed in this lesson. Ask students to list the steps in constructing a dilation. Students should include examples that	Use formative assessments suggested in the textbook. Use Guided Practice, Check Your Understanding, HOT problems, and Spiral Reviews as needed. Use Ticket Out the Door Section 9.1 and 9.6. Use Mid-Chapter Quiz Lesson 9.1-9.3 p 649.

G.CO.8 Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. G.CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). G.MD.4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. G.SRT.1 Verify experimentally the properties of dilations given by a center and a scale factor.	congruence transformations. Draw reflections and rotations of figures. Draw dilations.	Draw dilations in the coordinate plane.	illustrate the steps and list the properties of a dilation.	Use Self-Check Quizzes as needed.
Resources: Leveled Worksheets, Personal Tutor, Virtual Manipulatives, 5-Minute Checks found on connect.ED.mcgraw-hill.com Geometer's Sketchpad Graphing Calculator Teaching Geometry with Manipulatives			**Instructional Adjustments:** Use Leveled Worksheets. Use Lesson Resources to provide differentiation. Use scaffolding questions provided at the start of each lesson. Use error analysis and Watch Out tips suggested in the textbook. Use Tip for New Teachers suggested in the textbook.	

Unit Title: Chapter 10 Circles

Targeted Standards: G.CO Experiment with transformations in the plane. **G.C** Understand and apply theorems about circles. **G.MG** Apply geometric concepts in modeling situations. **G.GPE** Translate between the geometric description and the equation for a conic section.
Unit Objectives/Conceptual Understandings: Find areas of sectors and arc lengths of circles using proportional reasoning. Use numeric and geometric patterns to make generalizations about geometric properties including properties of angle relationships in circles.
Essential Questions: How can circles be used?
Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/ Interdisciplinary Connections	**Assessment Check Points**
G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. G.CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). G.CO.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	Unit vocabulary including: a. circle b. center c. radius d. chord e. diameter f. circumference g. pi (π) h. inscribed i. circumscribed j. central angle k. arc l. tangent m. secant n. chord segment Radius-chord relationships Arc-chord-central angle relationships Inscribed Angle Theorem	Identify and use parts of circles. Solve problems involving the circumference of a circle. Identify and measure central angles, arcs, and semicircles. Find arc length. Recognize and use relationships between arcs and chords. Recognize and use relationships between arcs, chords, and diameters. Find measures of inscribed angles. Find measures of angles of inscribed polygons. Use properties of tangents. Solve problems involving circumscribed polygons.	**Visual/Spatial Learners** Instruct students to use a piece of string to estimate the circumference of discs or cylinders. Then have students measure the diameter of the object. Review the formulas for finding circumference by using the diameter and the radius. Have students find the circumference mathematically, using the diameter and then the radius. Have students compare their calculations with the estimate they found by using the string. **Verbal/Linguistic Learners** Have students construct a circle with two congruent chords and the perpendicular bisectors. Then have them write a proof supporting the congruency of their construction.	Suggested quiz after section 10.2 Suggested quiz after section 10.4 Suggested quiz after section 10.6 Suggested quiz after section 10.8 Exit tickets provided in text Teacher-generated exit tickets Teacher-generated formative/summative assessment

G.C.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. G.C.2 Derive the equation of a parabola given a focus and directrix. G.C.3 Use coordinates to prove simple geometric theorems algebraically. G.C.4 Use coordinates to prove simple geometric theorems algebraically. G.C.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point). G.MG.3 Apply geometric methods to solve problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with	Tangent-radius relationships Theorems about angles formed by secants, tangents, and chords Equation of a circle in standard form	Find measures of angles formed by lines intersecting on or inside a circle. Find measures of angles formed by lines intersecting outside a circle. Find measures of segments that intersect in the interior of a circle. Find measures of segments that intersect in the exterior of a circle. Write the equation of a circle. Graph a circle on the coordinate plane.	**Extension** Have students describe the difference between a central angle and an inscribed angle, and how their measures are related if they intercept the same arc. **Extension** Have each student find another real-life example of segments of circles in construction, nature, and so on. Instruct students to write a brief explanation of the example they found, construct a sketch of the example, insert accurate measurements if possible, and then write an equation on the information.	

typographic grid systems based on ratios). G.GPE.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. G.GPE.2 Derive the equation of a parabola given a focus and directrix. G.GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio. .				
Resources: Essential Materials, Supplementary Materials, Links to Best Practices, Leveled Worksheets, Personal Tutor, Virtual Manipulatives, 5-Minute Checks, Graphing Calculator			**Instructional Adjustments:** Leveled Worksheets, Differentiation Resources, Scaffolding Questions, Use “Watch Out” questions provided in the text	

Unit Title: Chapter 11 Areas of Polygons and Circles

Targeted Standards: G.GPE Translate between the geometric description and the equation for a conic section. G.C Understand and apply theorems about circles. G.GMD Explain volume formulas and use them to solve problems. G.MG Apply geometric concepts in modeling situations.

Unit Objectives/Conceptual Understandings: Students will be able to: Find areas of regular polygons, circles, and composite figures. Find areas of sectors and arc lengths of circles using proportional reasoning.

Essential Questions: How can decomposing and recomposing shapes help us build our understanding of mathematics?

Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/ Interdisciplinary Connections	**Assessment Check Points**
G.GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio. G.MG.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder). G.MG.2 Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). G.MG.3 Apply geometric methods to solve problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic	Unit vocabulary including: a. base of a parallelogram b. height of a parallelogram c. base of a triangle d. height of a triangle e. height of a trapezoid f. sector of a circle g. center of a regular polygon h. radius of a regular polygon i. apothem j. central angle of a regular polygon Find the area of rectangles and squares.Find perimeters and areas of parallelograms. Find the areas of triangles. Find the circumference of a circle. Find areas of circles and sectors.	Find the perimeter and area of parallelograms and triangles. Find the areas of trapezoids, rhombi, and kites. Find the areas of circles and sectors of circles. Find areas of regular polygons and composite figures. Find areas of similar figures by using scale factors. Find scale factors or missing measures given the areas of similar figures.	Have students cut out two parallelograms of different sizes. First, have students cut a right triangle from the end of one of the parallelograms and rearrange the pieces to form a rectangle. Then, ask students to find the area of the rectangle. Next, have students cut the second parallelogram in half diagonally and determine the area of the resulting triangles. Draw on students' prior knowledge by having them create a blueprint of their kitchen including the bases of all structures. Ask students to include a scale. Use these drawings to have students estimate the number of tiles that would be needed to cover the floor. Varying the size of the tile is an easy way to differentiate this task for different ability	Use formative assessments suggested in the textbook. Use Guided Practice, Check Your Understanding, HOT problems, and Spiral Reviews as needed. Use Ticket Out the Door Section 11.2 and 11.3. Use Mid-Chapter Quiz Lesson 11.1-11.3 p 805. Use Self-Check Quizzes as needed.

grid systems based on ratios). G.C.5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector. G.GMD.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.	Find areas of regular polygons. Find areas of composite figures. Use scale factors and proportions to solve problems involving the perimeters of similar figures.		levels. This task enables students to view area as something that is not always neat and formulaic. Have students discuss how the area of a sector relates to the area of the entire circle. Have them write how the equation for a sector logically represents a portion of the circle.	
Resources: Leveled Worksheets, Personal Tutor, Virtual Manipulatives, 5-Minute Checks found on connect.ED.mcgraw-hill.com Geometer's Sketchpad Graphing Calculator Teaching Geometry with Manipulatives			**Instructional Adjustments:** Use Leveled Worksheets. Use Lesson Resources to provide differentiation. Use scaffolding questions provided at the start of each lesson. Use error analysis and Watch Out tips suggested in the textbook. Use Tip for New Teachers suggested in the textbook.	

Unit Title: Chapter 12 Extending Surface Area and Volume

Targeted Standards: G.MG Apply geometric concepts in modeling situations. **G.GMD** Explain volume formulas and use them to solve problems.
Unit Objectives/Conceptual Understandings: Find surface areas and volumes of prisms, pyramids, spheres, cones, cylinders, and composites of these figures. Describe the effect on area and volume when one or more dimensions of a figure are changed.
Essential Questions: How are two-dimensional and three-dimensional figures related?
Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What students will know.	**Skills** What students will be able to do.	**Activities/Strategies** Technology Implementation/ Interdisciplinary Connections	**Assessment Check Points**
G.MG.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder). G.MG.3 Apply geometric methods to solve problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). G.GMD.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.	Unit vocabulary including: a. right solid b. oblique solid c. isometric view d. cross section e. lateral face f. lateral edge g. altitude h. lateral area i. axis j. regular pyramid k. slant height l. right cone m. oblique cone n. great circle o. Euclidean geometry p. spherical geometry q. similar solids r. congruent solids Application of volume formulas	Draw isometric views and investigate cross sections of three-dimensional figures. Find surface areas and volumes of prisms, pyramids, spheres, cones, cylinders. Find the lateral areas and surface areas of prisms. Find the lateral and surface areas of cylinders. Find lateral areas and surface areas of pyramids. Find lateral areas and surface areas of cones. Find the volumes of prisms and cylinders. Find the volumes of pyramids and cones.	**Extension** Ask students to develop a demonstration that shows how two different-shaped cylinders can have the same volume. **Visual/Spatial Learners** When you discuss cones and pyramids, show students that 3 cones fit into a cylinder with the same corresponding base and height by filling a cone with water, rice, or beans and pouring it into the corresponding cylinder or pyramid. This same relationship is true for three pyramids fitting in a prism with a corresponding base and height. **Naturalist Learners** One way to compare moons is by their approximate diameters. Ask students to describe how to	Suggested quiz after section 12.2 Suggested quiz after section 12.4 Suggested quiz after section 12.6 Suggested quiz after section 12.8 Exit tickets provided in text Teacher-generated exit tickets Teacher-generated formative/summative assessment

G.GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. Visualize relationships between two-dimensional and three-dimensional objects. G.GMD.4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	Application of surface area formulas Theorems about similar solids Theorems about congruent solids	Find the surface areas and volumes of spheres. Describe sets of points on a sphere. Compare and contrast Euclidean and spherical geometries. Identify congruent and similar solids, and use properties of similar solids.	find the surface area of a moon. **Visual/Spatial Learners** Have students create a map on a sheet of paper with lines indicating the shortest distance between two points. Wrap the map around a ball or globe, and use a piece of string to compare the original lines with the arcs connecting the points. **Extension** Using a graphing program with three-dimensional capabilities, have students investigate similar triangles drawn on a sphere. Is it possible for two spherical triangles to be similar without being congruent?	
Resources: Essential Materials, Supplementary Materials, Links to Best Practices, Leveled Worksheets, Personal Tutor, Virtual Manipulatives, 5-Minute Checks, Graphing Calculator			**Instructional Adjustments:** Leveled Worksheets, Differentiation Resources, Scaffolding Questions, Use “Watch Out” questions provided in the text	

Unit Title: Chapter 13 Probability and Measurement

Targeted Standards: S.CP – Find probabilities and use probabilities to make fair decisions
Unit Objectives/Conceptual Understandings: Students will use permutations and combinations to find probabilities, understand independent/dependent events and conditional probability, apply the Addition Rule and use probabilities to make fair decisions.
Essential Questions: How do we find the sample space and use it to calculate probability?
Unit Assessment: Teacher-generated assessments will be used.

	Core Content Objectives		**Instructional Actions**	
Cumulative Progress Indicators	**Concepts** What the student will know.	**Skills** What the student will be able to do.	**Activities/Strategies** Implementation/Interdisciplinary Connections	**Assessment Check Points**
S.CP.1 – 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”). S.CP.2 – Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. S.CP.3 – Understand the conditional probability of A given B as $\frac{P(A \text{ and } B)}{P(B)}$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.	Unit vocabulary including: a. Sample space b. Tree diagram c. Two-stage experiment d. Multi-stage experiment e. Fundamental Counting Principle f. Permutation g. Factorial h. Circular permutation i. Combination j. Geometric probability k. Probability model l. Simulation m. Random variable n. Expected value o. Law of Large Numbers p. Compound event q. Independent events	Use tree diagrams, Fundamental Counting Principle, permutations and combinations to find sample spaces and/or the number of possible outcomes Find probabilities by using length Find probabilities by using area Design simulations to estimate probabilities Summarize data from simulations Find probabilities of independent and dependent events	Lesson 13-3 relates probability to geometry and has several real-world applications	Selected exercises can be used as Formative Assessments as suggested in the textbook Suggest quizzes after Lesson 13-2, 13-4 and 13-6

S.CP.7 – Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model. S.CP.9 – Use permutations and combinations to compute probabilities of compound events and solve problems. S.MD.6 – Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator). S.MD.7 – Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game). S.MG.3 – Apply geometric methods to solve problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	r. Dependent events s. Conditional probability t. Probability tree u. Mutually exclusive events v. Complement	Find probabilities of events given the occurrence of other events Find probabilities of events that are mutually exclusive Find probabilities of events that are not mutually exclusive Find probabilities of complements		

Resources: Leveled Worksheets, Virtual Manipulatives, Animations, Personal Tutor Teaching Geometry with Manipulatives	**Instructional Adjustments:** Use Leveled Worksheets Use Lesson Resources to provide differentiation Use scaffolding questions provided at the start of each lesson