PLANNED INSTRUCTION

A PLANNED COURSE FOR:

Geometry

Curriculum Writing Committee:

Alyssa Nied, Hunter McKean

Grade Level: 9, 10

Date of Board Approval: _____

Course Weighting: Geometry

	Test	Quiz	Graded Assignment	Homework & Participation	Total Points
Marking Period 1	200	90	40	30	360
Marking Period 2	300	90	20	30	440
Marking Period 3	200	110	40	30	380
Marking Period 4	300	100	40	30	470
Total points	1000	390	140	120	1650
Total percentages	61%	24%	8%	7%	100%

Curriculum Map

Overview:
This course follows Algebra 1. It introduces the theorem-proof structure of mathematics. Logical deductive thinking is stressed in the writing of formal proofs and in the solution of geometric problems. Topics include parallel lines, congruent and similar triangles, and the properties of higher polygons. Throughout the course, algebra applications are embedded in geometric problems to reinforce algebra skills.

Goals:

- **Marking Period 1 (45 Days) - Students will be able to…**
  - **Unit 0: Probability - 10 Days**
    - Find probability and simulate quantitative data
    - Compare independent and dependent events
    - Identify the sample space
    - Use Venn diagrams, two-way tables, and tree diagrams for probability
    - Apply rules for mutually exclusive events and conditional probability
  - **Unit 1: Tools of Geometry - 20 Days**
    - Identify and name basic geometry terms and concepts: points, lines, and planes
    - Compare postulates and theorems
    - Apply the midpoint and distance formulas given two coordinate points
    - Understand the concept of congruence (segments and angles)

        - Apply the segment addition postulate to solve problems involving segments, midpoints, and bisectors
        - Apply the angle addition postulate to solve problems involving angles and angle bisectors
        - Measure and classify angles, including special angle pair relationships
        - Solve algebraic applications of angles and segments
    - **Unit 2: Logic - 15 Days**
        - Compare inductive and deductive reasoning
        - Represent logical arguments using Boolean algebra symbols
        - Identify, write, and determine the truth value of compound statements, conditional statements, and related conditional statements
        - Identify logically equivalent statements (conditional, converse, inverse, contrapositive)
        - Apply the Law of Syllogism to draw valid conclusions
        - Construct algebraic and geometric proofs

- **Marking Period 2 (45 Days) - Students will be able to…**
    - **Unit 3: Triangles - 24 Days**
        - Find missing measures of isosceles and equilateral triangles
        - Prove and apply the Exterior Angle Theorem
        - Solve algebraic applications of triangles
        - Identify congruent triangles and write congruency statements
        - Construct proofs involving congruent triangles
    - **Unit 4: Parallel Lines and Transversals - 15 Days**
        - Identify angle pairs formed by transversals
        - Find missing measures of angles formed by parallel lines and transversals
        - Solve algebraic applications of angles formed by parallel lines and transversals
        - Prove lines are parallel
        - Apply theorems involving perpendicular lines
    - **Unit 5: Polygons - 6 Days**
        - Identify and apply properties of polygons
        - Solve algebraic applications of polygons
        - Identify and apply properties of parallelograms

- **Marking Period 3 (45 Days) - Students will be able to…**
    - **Unit 5: Polygons (Continued) - 20 Days**
        - Identify and apply properties of special parallelograms (rectangles, rhombuses, squares)
        - Identify and apply properties of trapezoids and kites
        - Solve algebraic applications of quadrilaterals
        - Construct proofs involving parallelograms
    - **Unit 6: Similar Triangles - 10 Days**
        - Identify special segments within triangles
        - Apply the triangle inequality theorem

        - Identify and find missing measures of similar polygons, focusing on similar triangles
        - Solve algebra applications involving similar triangles
        - Construct proofs involving similar triangles
        - Apply similarity to real-world problems
    - **Unit 7: Right Triangles - 15 Days**
        - Apply the Triangle Inequality Theorem
        - Apply the Pythagorean Theorem to find missing sides of a right triangle
        - Apply the converse of the Pythagorean Theorem to classify triangles
        - Identify and find missing measures of special right triangles

- **Marking Period 4 (45 Days) - Students will be able to…**
    - **Unit 7: Right Triangles (Continued) - 6 Days**
        - Use trigonometric ratios to find missing measures (sine, cosine, and tangent ratios)
        - Apply trigonometry to real-world problems
    - **Unit 8: Circles - 20 Days**
        - Identify specific terms, special segments, and special angles
        - Center-radius form of a circle
        - Write equations of a circle
        - Apply coordinate geometry with circles, specifically using the distance and midpoint formulas
    - **Unit 9: Area, Surface Area, Volume / Final - 19 Days**
        - Compare the area versus the perimeter of polygons
        - Find area and circumference of circles, including arc length and area of sectors
        - Find the area of regular polygons
        - Find the surface area of solids
        - Find the volume of solids
        - Final Review & Final

Big Ideas:

- Big Idea #1: There are some mathematical relationships that are always true, and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions, solving equations, and inequalities.
- Big Idea #2: Mathematical statements can be justified through deductive and inductive reasoning and proof.
- Big Idea #3: Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools
- Big Idea #4: Euclid's fifth postulate, known as the parallel postulate, is an essential axiom in Euclidean Geometry. Angle measurements are derived from the relationships of parallel and perpendicular lines. The parallel postulate allows these fundamental relationships to hold true.
- Big Idea #5: Patterns exhibit relationships that can be extended, described, and generalized.

- Big Idea #6: Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization.

Textbook and Supplemental Resources:

- **Primary Textbook Name:** Glencoe Geometry
  - **Textbook ISBN:** 978-0-07-903994-1
  - **Textbook Publisher/Year of Publication:** McGraw-Hill Education, 2018

- **Supplemental Resources:**
  - Kuta Software: Geometry
  - Geometer's Sketchpad
  - GeoGebra
  - Desmos
  - IXL

Curriculum Plan

Unit 0: Probability (10 Days)

- **Standards:**
  - CC.2.4.HS.B.4 Recognize and evaluate random processes underlying statistical experiments
  - CC.2.4.HS.B.6 Use the concepts of independence and conditional probability to interpret data
  - CC.2.4.HS.B.7 Apply the rules of probability to compute probabilities of compound events in a uniform probability model

Objectives:

- Recognize that some phenomena are random. Predict the long-run regularity of random phenomena. (DOK - 1, 2)
- Understand that the probability of an event as the proportion of times the event occurs in very many repetitions of a random phenomenon. (DOK - 1)
- Recognize that the short runs of random phenomena do not display the regularity described by probability. Accept that randomness is unpredictable in the short run, and avoid seeking cause and effect explanations for random occurrences. (DOK - 1, 2)
- Design a survey to collect data to calculate probabilities for the students in the class. (DOK - 4)
- Estimate a probability by repeating a simulation many times. (DOK - 2)
- Collect and display the probability of an event by adding the probabilities of the outcomes that make it up. (DOK - 1)
- Use probability rules to find the probabilities of events that are formed from other events, including unions, intersections, complements, and conditional probabilities. (DOK - 1)

- Construct Venn diagrams, two-way tables, and tree diagrams to model chance behavior and draw conclusions from each diagram. (DOK - 2, 3)
- Compute probabilities using information provided from Venn diagrams, two-way tables, and tree diagrams. (DOK - 2)

Core Activities and Corresponding Instructional Methods:

- Opening day activity for the class to get to know each other: Compete in a rock, paper, scissors, tournament.
    - The following day, the teacher will introduce and define probability using the rock, paper, scissors as an example of a random experiment. Students will find the sample space of a game of rock paper scissors and the probability of winning, losing, and tying in a game of rock paper scissors.
- Perform various simulations with cards, dice, and coins to experience probability as long-term relative frequency.
- Complete a short survey answering questions about themselves. Class will discuss the difference in responses of the survey and classify them as quantitative and categorical variables. Data from the survey will be used to construct two-way tables and venn diagrams. Students will interpret and calculate probabilities from the data.
- Analyze two-way tables and venn diagrams created by collecting data to predict the chance of a randomly selected person being in that category.
- Use SAT problems found from College Board practice tests to answer higher-level questions regarding probability and statistics.
- Complete warm-ups involving Algebra Keystone review problems and SAT problems to reinforce key Algebra 1 topics, including simplifying radicals, equations of a line, systems of equations, and factoring.

Assessments:

- **Diagnostic:**
    - ~~Glencoe Geometry Support File Chapter 1, 2, and 12~~
    - ~~Teacher prepared pre-test/diagnostic test~~
    - Teacher observations and questioning techniques
    - Keystone Benchmark Assessment

- **Formative:**
    - Teacher observations, questions, discussions
    - Teacher assigned homework
    - Teacher prepared assessments (quizzes and graded assignments)
    - Warm-ups

- **Summative:**
    - Unit 0: Probability Common Assessment

- **Correctives:**
    - Provide guided practice with teacher feedback
    - Conduct small-group reteaching opportunities

    - Extra practice in the Math Lab
    - IXL Practice Skills & Videos

- **Extensions:**
    - Complete probability simulations, including "The Office Secret Santa", landing on orange in Monopoly, a family of 3 children all being boys, and being dealt a royal flush in poker
    - Create a short survey of 10 questions that they want to know about their classmates
        - Note: Have a list of possible questions, but allow students to create their own. Oversee the survey so that the students are asking for quantitative and categorical variables.
    - Create a human box-and-whisker plot by having the students line up from shortest to tallest. Talk through the procedures for finding the median and the quartiles. Add a teacher and remove random students from the data set to discuss differences in the median and quartiles
    - Create and describe histograms from a large set of data (Presidents' age at Inauguration)
    - Analyze graphs that have been found in the news media that are incorrect and comment on the bias and ways the graphs were made misleading

Unit 1: Tools of Geometry (20 Days)

- **Standards:**
  - CC.2.3.HS.A.2 Apply rigid transformations to determine and explain congruence
  - CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures
  - CC.2.3.HS.A.11 Apply coordinate geometry to prove simple geometric theorems algebraically
  - CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context

Objectives:

- Students will be able to name and sketch geometric figures as well as name, measure, and classify angles. (DOK - 1, 2)
- Students will be able to use the distance and midpoint formulas to identify congruent segments and find lengths of segments in the coordinate plane. (DOK - 1, 2)
- Students will be able to apply the segment addition postulate to find missing lengths in a segment. (DOK - 2)
- Students will be able to apply the angle addition postulate to find missing angle measures. (DOK - 2)
- Students will be able to use special angle relationships (vertical angles, linear pairs, complementary angles, supplementary angles) to determine angle measures. (DOK - 1).
- Students will be able to apply properties of special pairs of angles. (DOK - 4)
- Students will be able to identify and solve problems involving angle and segment bisectors. (DOK - 1, 2)
- Students will be able to use angle postulates to identify congruent angles and find measures of angles. (DOK- 1, 2)
- Students will be able to use postulates involving points, lines, and planes. (DOK - 3)
- Students will be able to solve algebraic applications involving segments and angles. (DOK - 2)

Core Activities and Corresponding Instructional Methods:

- Use Geometer's Sketchpad or Geogebra to identify properties of points, lines, and planes.
- Derive the distance formula from the Pythagorean Theorem.
- Use Geometer's Sketchpad or Geogebra to show the idea of betweenness of points or the segment addition postulate. That only when A, B, and C are collinear does AB + BC = AC.
- Measure angles using a protractor to reinforce the concept that an angle is the measure of a rotation between two rays.
- Use Geometer's Sketchpad or Geogebra to discover theorems on terms such as complementary, supplementary, vertical angles, and linear pairs.
- Analyze and solve various diagrams involving lines and angles.
- Complete algebra applications involving segments and angles.
- Complete SAT Problems involving lines and angles from College Board practice tests.

- Complete warm-ups involving Algebra Keystone review problems and SAT problems to reinforce key algebra 1 topics, including simplifying radicals, equations of a line, systems of equations, and factoring.

Assessments:

- **Diagnostic:**
  - ~~Glencoe Geometry Support File Chapter 2 and 4~~
  - ~~Teacher prepared pre-test/diagnostic test~~
  - Teacher questioning and observation

- **Formative:**
  - Teacher observations, questions, discussions
  - Teacher assigned homework
  - Teacher prepared assessments (quizzes and graded assignments)
  - Warm-ups

- **Summative:**
  - Unit 1: Tools of Geometry Common Assessment

- **Correctives:**
  - Provide guided practice with teacher feedback
  - Conduct small-group reteaching opportunities
  - Extra practice in the Math Lab
  - IXL Practice Skills & Videos
  - Kuta Software Worksheets

- **Extensions:**
  - Challenging Geometry Problems
  - Explore how earlier civilizations used geometry

Unit 2: Logic (15 Days)

- **Standards:**
  - CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures
  - CC.2.3.HS.A.6 Verify and apply theorems involving similarity as they relate to plane figures
  - CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable
  - CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method

Objectives:

- Students will be able to use inductive reasoning to discern and describe patterns. (DOK - 3)
- Students will be able to rewrite statements as conditional statements as well as transform statements to the converse, inverse, and contrapositive, recognizing which statements are logically equivalent. (DOK - 1)
- Students will be able to identify the truth value of and write biconditional statements. (DOK - 2)
- Students will be able to use deductive reasoning to construct a logical argument, including algebraic properties when appropriate. (DOK - 3)
- Students will be able to construct algebraic proofs. (DOK - 3)
- Students will be able to write elementary proofs of geometric theorems by stating the given, using postulates, properties, or other theorems to arrive at the desired conclusion. (DOK - 4)

Core Activities and Corresponding Instructional Methods:

- Introduce counterexamples and inductive vs. deductive reasoning using non-math related examples.
- Create and modify definitions using biconditional statements. Define terms such as obtuse angles, acute angles, linear pairs, and squares.
- Introduced to syllogisms using the DirectTV commercial.
- Construct algebraic proofs using properties of equality.
- Investigate "What do we know? How do we know it?" problems to identify conclusions from knowing the given information.
- Connect the idea of a conditional statement to proof writing, where the hypothesis is the given and the conclusion is the prove statement. Students will diagram various proof setups.
- Complete warm-ups on Algebra Keystone review problems and SAT problems to reinforce key algebra 1 topics, including equations of a line, systems of equations, and factoring.

Assessments:

- **Diagnostic:**
  - ~~Glencoe Geometry Support File Chapter 2 and 4~~

- ~~Teacher prepared pre-test/diagnostic test~~
- Teacher questioning and observation

- **Formative:**
  - Teacher observations, questions, discussions
  - Teacher assigned homework
  - Teacher prepared assessments (quizzes and graded assignments)
  - Warm-ups

- **Summative:**
  - Unit 2: Logic Common Assessment

- **Correctives:**
  - Provide guided practice with teacher feedback
  - Conduct small-group reteaching opportunities
  - Extra practice in the Math Lab
  - IXL Practice Skills & Videos

- **Extensions:**
  - Complete logic problems and puzzles
  - Construct two-column proofs involving angles and line segments
  - Challenging Geometry Problems

Unit 3: Congruent Triangles

- **Standards:**
  - CC.2.3.HS.A.1 Use geometric figures and their properties to represent transformations in the plane
  - CC.2.3.HS.A.2 Apply rigid transformations to determine and explain congruence
  - CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures
  - CC.2.3.HS.A.4 Apply the concept of congruence to create geometric constructions
  - CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects
  - CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable

Objectives:

- Students will be able to classify triangles and find measures of their angles. (DOK- 2)
- Students will be able to apply the Exterior Angle Theorem to find missing angle measures (DOK- 1)
- Students will be able to prove and use theorems involving isosceles and equilateral triangles. (DOK- 4)
- Students will be able to identify congruent figures, accurately stating the congruence relationship. (DOK- 3)
- Students will be able to apply theorems and use triangle congruence to write and solve algebraic equations. (DOK - 2)
- Students will be able to use sides and angles to prove triangles congruent. (DOK- 4)
- Students will be able to use congruent triangles to prove corresponding parts congruent. (DOK- 4)

Core Activities and Corresponding Instructional Methods:

- Prove that the sum of the interior angles in a triangle are 180 degrees by having the students "rip" the angles of a triangle and making the angles adjacent.
- Discover the exterior angles theorem by finding the missing interior and exterior angles of a triangle using linear pairs. Students will then construct a two-column proof of the Exterior Angle Theorem.
- Solve algebra applications with triangle properties, including ratio, systems, and linear equations.
- Practice SAT problems involving triangles found in the College Board practice tests.
- Use GeoGebra to investigate which combination of sides and angles can be used to prove triangles are congruent.
- Demonstrate that HL only works for right triangles via Geometer's Sketchpad activities or GeoGebra.
- Complete warm-ups on Algebra Keystone review problems and SAT problems to reinforce key algebra 1 topics, including equations of a line, systems of equations, and factoring.

Assessments:

- **Diagnostic:**
  - ~~Glencoe Geometry Support File Chapter 2 and 4~~
  - ~~Teacher prepared pre-test/diagnostic test~~
  - Teacher questioning and observation

- **Formative:**
  - Teacher observations, questions, discussions
  - Teacher assigned homework
  - Teacher prepared assessments (quizzes and graded assignments)
  - Warm-ups

- **Summative:**
  - Unit 3: Congruent Triangles Common Assessment

- **Correctives:**
  - Provide guided practice with teacher feedback
  - Conduct small-group reteaching opportunities
  - Extra practice in the Math Lab
  - IXL Practice Skills & Videos
  - Kuta Software Worksheets

- **Extensions:**
  - Complete additional challenging proofs.
  - Challenging Geometry Problems

Unit 4: Parallel Lines

- **Standards:**
  - CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures
  - CC.2.3.HS.A.11 Apply coordinate geometry to prove simple geometric theorems algebraically
  - CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships
  - CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable

Objectives:

- Students will be able to identify angle pairs formed by two lines cut by a transversal. (DOK - 1)
- Students will be able to use angles formed by parallel lines and transversals to find missing angle measures. (DOK - 2)
- Students will be able to use angle relationships to write and solve algebraic equations. (DOK - 2)
- Students will be able to use angle relationships to prove that lines are parallel. (DOK - 4)
- Students will be able to apply theorems involving perpendicular lines. (DOK - 2)

Core Activities and Corresponding Instructional Methods:

- Use GeoGebra to show students that angle pairs only have a numeric relationship if the lines cut by the transversal are parallel.
- Prove how angle relationships involving alternate interior, alternate exterior, same side interior, and same side exterior angles imply parallel.
- Solve algebra applications with parallel and perpendicular lines, including ratios, systems of equations, and linear equations.
- SAT problems with parallel and perpendicular lines from College Board practice exams.
- Complete warm-ups on Algebra Keystone review problems and SAT problems to reinforce key algebra 1 topics, including equations of a parallel and perpendicular lines.

Assessments:

- **Diagnostic:**
  - ~~Glencoe Geometry Support File Chapter 2 and 4~~
  - ~~Teacher prepared pre-test/diagnostic test~~
  - Teacher questioning and observation
  - Keystone Benchmark Assessment

- **Formative:**
  - Teacher observations, questions, discussions
  - Teacher assigned homework
  - Teacher prepared assessments (quizzes and graded assignments)
  - warm-ups

- **Summative:**
  - Unit 4: Parallel Lines Common Assessment

- **Correctives:**
  - Provide guided practice with teacher feedback
  - Conduct small-group reteaching opportunities
  - Extra practice in the Math Lab
  - IXL Practice Skills & Videos
  - Kuta Software Worksheets

- **Extensions:**
  - Complete challenging proofs involving parallel and perpendicular lines
  - Parallel Lines City Map Puzzle
  - Challenging Geometry Problems

Unit 5: Polygons & Quadrilaterals (26 Days)

- **Standards:**
    - CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures
    - CC.2.3.HS.A.11 Apply coordinate geometry to prove simple geometric theorems algebraically
    - CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects
    - CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable

Objectives:

- Students will be able to calculate interior and exterior angle measures in polygons, including angles in regular polygons. (DOK - 1)
- Students will be able to identify, prove, and then apply properties of parallelograms to determine angle and side measures. (DOK - 1)
- Students will be able to use properties to identify special parallelograms. (DOK - 2)
- Students will be able to identify, prove, and then apply properties of rhombi, rectangles, and squares. (DOK - 4)
- Students will be able to identify and apply properties of trapezoids and kites. (DOK - 4)
- Students will be able to identify special quadrilaterals, given specific properties. (DOK - 2)
- Students will be able to solve algebraic applications of polygons. (DOK - 2)

Core Activities and Corresponding Instructional Methods:

- Discover the formulas for polygons (number of diagonals, interior, and exterior angles) through examples and deductive reasoning.
- Complete problem-solving activities with polygons that challenge students to apply the formulas to solve.
- Discover the relationships of quadrilaterals via Geometer's Sketchpad or GeoGebra.
- Construct the quadrilateral flow chart so students can better understand the relationship between the special types of quadrilaterals.
- ~~Students will work in teams to prove the relationships they discovered about quadrilaterals and present them to the class.~~
- Complete SAT problems with quadrilaterals from College Board practice exams.
- Solve algebra applications with quadrilaterals, including ratio, systems of equations, and factoring.
- Complete SAT problems involving area from College Board practice exams.
- Complete warm-ups on Algebra Keystone review problems and SAT problems to reinforce key algebra 1 topics, including equations of a line, systems of equations, and factoring.

Assessments:

- **Diagnostic:**

- ~~Glencoe Geometry Support File Chapter 5, 6, 7, and 8~~
- ~~Teacher prepared pre-test/diagnostic test~~
- Teacher questioning and observation
- Keystone Benchmark Assessment

- **Formative:**
  - Teacher observations, questions, discussions
  - Teacher assigned homework
  - Teacher prepared assessments (quizzes and graded assignments)
  - Warm-ups

- **Summative:**
  - Unit 5: Polygons & Quadrilaterals Common Assessment

- **Correctives:**
  - Provide guided practice with teacher feedback
  - Conduct small-group reteaching opportunities
  - Extra practice in the Math Lab
  - IXL Practice Skills & Videos

- **Extensions:**
  - Work in teams to prove the relationships they discovered about quadrilaterals and present them to the class
  - Challenging Geometry Problems

Unit 6: Similar Triangles (10 Days)

- **Standards:**
  - CC.2.3.HS.A.1 Use geometric figures and their properties to represent transformations in the plane
  - CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures
  - CC.2.3.HS.A.6 Verify and apply theorems involving similarity as they relate to plane figures
  - CC.2.3.HS.A.11 Apply coordinate geometry to prove simple geometric theorems algebraically
  - CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects
  - CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable

Objectives:

- Students will be able to identify similar polygons. (DOK - 3)
- Students will be able to prove that triangles are similar. (DOK - 3)
- Students will be able to solve algebra applications of similar figures. (DOK - 2)
- Students will be able to use proportions to solve geometry problems (applications of similarity). (DOK - 3)

Core Activities and Corresponding Instructional Methods:

- Review ratios and solving proportions.
- Solve algebra applications with similarity.
- Apply similarity to real-world applications. This includes problems involving shadows, reflections, and enlargements.
- Discover methods to prove polygons similar via Geometer's Sketchpad or Geogebra.
- Examine applications with Angle-Angle similarity to use with similar triangles.
- Complete SAT problems with similarity from College Board practice exams.
- Complete warm-ups on Algebra Keystone review problems and SAT problems to reinforce key algebra 1 topics, including equations of a line, systems of equations, and factoring.

Assessments:

- **Diagnostic:**
  - ~~Glencoe Geometry Support File Chapter 5, 6, 7, and 8~~
  - ~~Teacher prepared pre-test/diagnostic test~~
  - Teacher questioning and observation
  - Keystone Benchmark Assessment

- **Formative:**
  - Teacher observations, questions, discussions
  - Teacher assigned homework

    - Teacher prepared assessments (quizzes and graded assignments)
    - Warm-ups

- **Summative:**
    - Unit 6: Similar Triangles Common Assessment

- **Correctives:**
    - Provide guided practice with teacher feedback
    - Conduct small-group reteaching opportunities
    - Extra practice in the Math Lab
    - IXL Practice Skills & Videos
    - Kuta Software Worksheets

- **Extensions:**
    - Construct two-column proofs involving similar triangles
    - Challenging Geometry Problems

Unit 7: Right Triangles (21 Days)

- **Standards:**
  - CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures
  - CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles
  - CC.2.3.HS.A.11 Apply coordinate geometry to prove simple geometric theorems algebraically
  - CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects
  - CC.2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios
  - CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable

Objectives:

- ~~Students will be able to find and compare slopes of lines as well as write equations of a line. (DOK – Level Three)~~
- ~~Students will be able to find the distance between a point and a line. (DOK – Level One)~~
- ~~Students will be able to use properties of midsegments and write coordinate geometry proofs. (DOK – Level Four)~~
- Students will be able to use perpendicular bisectors, angle bisectors, medians, and altitudes to solve problems. (DOK – 3)
- Students will be able to find possible side lengths of a triangle (Triangle Inequality Theorem). (DOK - 3)
- Students will be able to apply the Pythagorean Theorem to find side lengths in right triangles. (DOK - 2)
- Students will be able to apply the Pythagorean Theorem to real-world applications to find missing measures. (DOK - 2)
- Students will be able to classify a triangle by applying the converse of the Pythagorean Theorem. (DOK - 4)
- Students will be able to use the relationships between the sides of special right triangles. (DOK - 2)
- Students will be able to apply the sine, cosine, and tangent ratios to find the side lengths in right triangles. (DOK - 4)
- Students will be able to apply the inverse sine, cosine, and tangent ratios to find angle measures. (DOK - 4)

Core Activities and Corresponding Instructional Methods:

- Discover the Triangle Inequality Theorem by investigating if different side lengths can form a triangle. Use the straw activity or the GeoGebra activity to investigate.
- Discover the converse of the Pythagorean Theorem inequalities by observing different types of triangles and the relationship when substituting the sides into the Pythagorean Theorem.

- Investigate the rules for special right triangles. Use the Pythagorean theorem to show that for similar triangles, the relationship between angles and sides is always the same.
- Tell the story of Soh-Cah-Toa to build the trigonometric ratios in right triangles. Build off previous knowledge of special right triangles.
- Apply trigonometric functions to real-world scenarios that require the calculation of a specific distance or angle measure.
- Complete SAT right triangle problems from College Board practice exams.
- Complete warm-ups on Algebra Keystone review problems and SAT problems to reinforce key algebra 1 topics, including equations of a line, systems of equations, and factoring.

Assessments:

- **Diagnostic:**
  - ~~Glencoe Geometry Support File Chapter 5, 6, 7, and 8~~
  - ~~Teacher prepared pre-test/diagnostic test~~
  - Teacher questioning and observation
  - Keystone Benchmark Assessment

- **Formative:**
  - Teacher observations, questions, discussions
  - Teacher assigned homework
  - Teacher prepared assessments (quizzes and graded assignments)
  - Warm-ups

- **Summative:**
  - Unit 7: Right Triangles Common Assessment

- **Correctives:**
  - Provide guided practice with teacher feedback
  - Conduct small-group reteaching opportunities
  - Extra practice in the Math Lab
  - IXL Practice Skills & Videos
  - Kuta Software Worksheets

- **Extensions:**
  - Find the heights of objects outside using an inclinometer and right triangle trigonometry
  - Challenging Geometry Problems

Unit 8: Circles (20 Days)

- **Standards:**
  - CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures
  - CC.2.3.HS.A.8 Apply geometric theorems to verify properties of circles
  - CC.2.3.HS.A.9 Extend the concept of similarity to determine arc lengths and areas of sectors of circles
  - CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects
  - CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable

Objectives:

- Students will be able to apply the properties of a tangent within a circle. (DOK - 4)
- Students will be able to use the measures of central angles to calculate arc measures. (DOK - 1)
- Students will be able to apply the relationships between arcs and chords in a circle. (DOK - 4)
- Students will be able to calculate the measure of an arc or an angle using inscribed angles of a circle. (DOK - 1)
- Students will be able to calculate segment length in circles. (DOK - 1)

Core Activities and Corresponding Instructional Methods:

- Use Geometer's Sketchpad or GeoGebra to discover relationships between angles and segments in circles.
- Use the Desmos calculator to introduce the relationship between the graph of a circle and its equation.
- Complete algebraic applications with circles, including writing the equation of a circle.
- Complete SAT problems with circles from College Board practice exams.
- Complete warm-ups on Algebra Keystone review problems and SAT problems to reinforce key algebra 1 topics, including equations of a line, systems of equations, and factoring.

Assessments:

- **Diagnostic:**
  - ~~Glencoe Geometry Support File Chapter 1, 9, 10, and 11~~
  - ~~Teacher prepared pre-test/diagnostic test~~
  - Teacher questioning and observation
  - Keystone Benchmark Assessment

- **Formative:**
  - Teacher observations, questions, discussions
  - Teacher assigned homework
  - Teacher prepared assessments (quizzes and graded assignments)

    - Warm-ups

- **Summative:**
    - Unit 8: Circles Common Assessment

- **Correctives:**
    - Provide guided practice with teacher feedback
    - Conduct small-group reteaching opportunities
    - Extra practice in the Math Lab
    - IXL Practice Skills & Videos
    - Kuta Software Worksheets

- **Extensions:**
    - Challenging Geometry Problems

Unit 9: Area, Surface Area, & Volume of Solids / Final (19 Days)

- **Standards:**
  - CC.2.3.HS.A.12 Explain volume formulas and use them to solve problems
  - CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects
  - CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems
  - CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable

Objectives:

- Students will be able to calculate the area of triangles and parallelograms. (DOK - 1)
- Students will be able to calculate the areas of other types of quadrilaterals. (DOK - 2)
- Students will be able to calculate the arc lengths and circumference of a circle. (DOK - 2)
- Students will be able to calculate the area of circles and sectors. (DOK - 2)
- Students will be able to calculate the area of regular polygons inscribed in circles.
- (DOK - 4)
- Students will be able to identify solids. (DOK - 2)
- Students will be able to calculate the surface areas of prisms, cylinders, pyramids, cones, and spheres. (DOK - 1)
- Students will be able to calculate the volume of prisms, cylinders, pyramids, cones, and spheres. (DOK - 1)

Core Activities and Corresponding Instructional Methods:

- Use Geometer's Sketchpad or GeoGebra to show how regular polygons get closer to a circle as the number of sides increases. Make the connection to limits for the future.
- Discover formulas for arc length, area of a sector, and segment of a circle.
- Discover the formulas for the area and perimeter of regular polygons.
- Discover formulas for arc length, area of a sector, and segment of a circle.
- Discover formulas for volume and surface area of solids.
- Solve real-world applications with solids.
- Complete SAT problems with solids from College Board practice exams.
- Complete warm-ups on Algebra Keystone review problems and SAT problems to reinforce key algebra 1 topics, including equations of a line, systems of equations, and factoring.
- Complete Final Review activities.
- IXL Practice Skill & Topics for the Final Review.
- List of additional topics to discuss if time permits:
  - Review algebra skills necessary for success in Algebra 2 & Trigonometry.
  - Use indirect measurement to find the heights of objects outside.

Assessments:

- **Diagnostic:**
  - ~~Glencoe Geometry Support File Chapter 1, 9, 10, and 11~~

- ~~Teacher prepared pre-test/diagnostic test~~
- Teacher questioning and observation
- Keystone Benchmark Assessment

- **Formative:**
  - Teacher observations, questions, discussions
  - Teacher assigned homework
  - Teacher prepared assessments (quizzes and graded assignments)
  - Warm-ups

- **Summative:**
  - Unit 9: Area, Surface Area, & Volume Common Assessment
  - Final Exam Common Assessment

- **Correctives:**
  - Provide guided practice with teacher feedback
  - Conduct small-group reteaching opportunities
  - Extra practice in the Math Lab
  - IXL Practice Skills & Videos

- **Extensions:**
  - Challenging Geometry Problems