Curriculum Map
Geometry
Saugus High School
Saugus Public Schools
The Standards for Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on the following two sets of important “processes and proficiencies,” each of which has longstanding importance in mathematics education:

- The NCTM process standards
  - problem solving
  - reasoning and proof
  - communication
  - representation
  - connections

- The strands of mathematical proficiency specified in the National Research Council’s report “Adding It Up”
  - adaptive reasoning
  - strategic competence
  - conceptual understanding (comprehension of mathematical concepts, operations, and relations)
  - procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently, and appropriately)
  - productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy)

1. Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

2. Reason abstractly and quantitatively.

Mathematically proficient students make sense of the quantities and their relationships in problem situations. Students bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically, and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meanings of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

3. Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.
4. Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

6. Attend to precision.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

7. Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see $7 + 8$ equals the well-remembered $7 + 5 + 7 + 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2 + 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square, and use that to realize that its value cannot be more than 5 for any real numbers $x$ and $y$.

8. Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through $(1, 2)$ with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$ and $(x - 1)(x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.
Connecting the Standards for Mathematical Practice to the Standards for Mathematical Content

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle, and high school years. Designers of curricula, assessments, and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematics instruction.

The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word “understand” are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview, or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging in the mathematical practices.

In this respect, those content standards which set an expectation of understanding are potential “points of intersection” between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum that most merit the time, resources, innovative energies, and focus necessary to qualitatively improve the curriculum, instruction, assessment, professional development, and student achievement in mathematics.

Foreword

This Curriculum Map outlines all of the topics and standards expected of a Geometry class. These concepts should be introduced, studied, and assessed at a level that matches each student’s abilities. The level of academic rigor should match both the course level and the students’ ability levels. The standards have been outlined based on the Massachusetts Curriculum Framework for Mathematics that incorporated the Common Core State Standards for Mathematics. The Honors level class will address advanced concepts. These concepts will be denoted by an asterisk or part of supplementary units located at the end of each term.
The students will:

8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where $p$ is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

8.EE.7 Solve linear equations in one variable.
   a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a, a = a,$ or $a = b$ results (where $a$ and $b$ are different numbers).

8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

8.G.1 Verify experimentally the properties of rotations, reflections, and translations:
8.G.3 Describe the effects of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.G.6 Explain a proof of the Pythagorean Theorem and its converse.
8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Unit Zero
Algebraic Review (Honors Only – Summer Work)*

- Graphing on the Coordinate Plane*
- Solving Algebraic Equations*
- Linear Functions*
- Radicals*
- Basic Geometric Figures*

Objectives
The students will be able to...
- plot and identify points in the coordinate plane.
- solve various algebraic equations in one variable.
- graph linear functions.
- use various forms of linear equations.
- perform operations on radicals.
- demonstrate a basic understanding of geometric figures.

Essential Question
How are the concepts of algebra related to the study of geometry?

Teacher Resources
Summer Packet for Honors students.

- *Holt Pre-Algebra ©2003* textbook and worksheets.
- *Holt Algebra One ©2004* textbook and worksheets.
- *Holt Middle School Mathematics Course 2 ©2007* textbook and worksheets.

Media Resources
Kuta Software Pre-Algebra Worksheet/Test Generator
Kuta Software Algebra 1 Worksheet/Test Generator
Kuta Software Geometry Worksheet/Test Generator

Assessments
Summer Packet: To be given prior to summer vacation. This will be collected during the 2nd or 3rd day of classes and selected problems will be graded as a Quiz.
Review: All concepts from the Summer Packet will be reviewed during the first 3 days of school.
Test: Prerequisites Test will be given to assess students’ understanding from prior courses.

Suggested Instructional Practices
- Note taking skills (guided notes)
Common Core State Standards

**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.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a through a point not on the line.*

**G.GPE.6** Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

**G.GPE.7** Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

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<tr>
<td>• Copying a Segment/Angle (G.CO.12, G.GPE.6)</td>
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<tr>
<td>• Bisecting a Segment/Angle (G.CO.12, G.GPE.6)</td>
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<tr>
<td>• Constructing Perpendicular Lines (G.CO.12, G.GPE.6)</td>
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<tr>
<td>The students will be able to…</td>
<td>What are the basic tools for a geometric construction and how does a construction differ from a measurement?</td>
</tr>
<tr>
<td>• <strong>find</strong> the slope of a line or segment, given two points on that line or segment.</td>
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<tr>
<td>• <strong>find or calculate</strong> the distance between to finds, length of a segment, or the midpoint of a segment given the endpoints.</td>
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<tr>
<td>• <strong>copy</strong> a given segment or angle using basic construction tools.</td>
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<tr>
<td>• <strong>use</strong> construction tools and procedures to bisect a segment or angle.</td>
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<tr>
<td>• <strong>construct</strong> perpendicular lines.</td>
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<tr>
<td>• <strong>construct</strong> perpendicular bisectors of segment.</td>
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<tr>
<td><strong>Homework:</strong> To be given daily on each introduced topic.</td>
<td>• GEO. 2012 #1 Coordinate Geometry &amp; Proof</td>
</tr>
<tr>
<td><strong>Class Discussion:</strong> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</td>
<td>• Note taking skills (guided notes)</td>
</tr>
<tr>
<td><strong>Baseline Assessment:</strong> The Baseline Assessment focused on Geometric Concepts will be given the 1st week of classes.</td>
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</tbody>
</table>
### Common Core State Standards

**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.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*

**G.CO.13** Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

### Unit One
#### Geometric Constructions

- Constructing the Perpendicular Bisectors (G.CO.12)
- Constructing a Line Parallel to a Given Line Through a Point (G.CO.12)
- Constructing Equilateral Triangles and Squares (G.CO.12, G.CO.13)

### Objectives

- **construct** perpendicular bisectors of segment.
- **construct** a line that is parallel to a given line through a given point.
- **construct equilateral triangles** using basic construction tools.
- **construct** squares using basic construction tools.

### Essential Question

How do you use the basic constructions to perform more elaborate constructions?

### Teacher Resources

*Holt Geometry ©2007*
- Chapter One lessons
- Chapter One Practice Worksheets
- Chapter One Pre-Made Assessments

*Prentice Hall Geometry ©1998*
- Chapter One from textbook
- Chapter One workbook resources

### Media Resources

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- PowerPoint Presentations
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Kuta Software Geometry Worksheet/Test Generator

### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Test:** on concepts involving Geometric Constructions.

### Suggested Instructional Practices

- Note taking skills (guided notes)
The students will:

**G.CO.9** Prove theorems about lines and angles. **Theorems include:** vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints.

**G.CO.10** Prove theorems about triangles. **Theorems include:** measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.

**G.CO.11** Prove theorems about parallelograms. **Theorems include:** opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

### Unit Two

**Geometric Reasoning**

- Inductive Reasoning (**G.CO.9, G.CO.10, G.CO.11**)
- Conditional Statements (**G.CO.9, G.CO.10, G.CO.11**)
- Deductive Reasoning (**G.CO.9, G.CO.10, G.CO.11**)
- Biconditional Statements (**G.CO.9, G.CO.10, G.CO.11**)

### Objectives

The students will be able to...

- **use** inductive reasoning to identify patterns and make conjectures.
- **disprove** conjectures using counterexamples.
- **identify**, **write**, and **analyze** the truth value of a conditional statement.
- **write** the inverse, converse, and contrapositive of a conditional statement.
- **use** deductive reasoning.
- **write** and **analyze** biconditional statements.

### Essential Question

Why is it important to include every logical step in a proof?

### Media Resources

- PowerPoint Presentations
- Textbook On-Line
- Homework Help (on-line)
- Test ExamPro Generator
- One-Stop CD Planner

Kuta Software Geometry Worksheet/Test Generator

### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **Reasoning and Conditional Statements**.

**Suggested Instructional Practices**

- Note taking skills (guided notes)
### Geometry (322 and 323)

#### Term One

<table>
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<tr>
<td><strong>G.CO.9</strong> Prove theorems about lines and angles. <em>Theorems include:</em> vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints.</td>
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#### Unit Two

**Geometric Reasoning**

- Algebraic Proofs (**G.CO.9, G.CO.10, G.CO.11**)
- Geometric Proofs (**G.CO.9, G.CO.10, G.CO.11**)
- Flowcharts and Paragraph Proofs * (**G.CO.9, G.CO.10, G.CO.11**)

**Objectives**

- **Write** algebraic proofs using properties of equality and congruence. *
- **Write** two-column proofs. *
- **Prove** geometric concepts using deductive reasoning.
- **Write** flowcharts and paragraph proofs. *

**Essential Question**

Why might there be more than one correct way to write a proof?

#### Teacher Resources

**Holt Geometry ©2007**

- Chapter Two lessons
- Chapter Two Practice Worksheets
- Chapter Two Pre-Made Assessments

**Prentice Hall Geometry ©1998**

- Chapter Four from textbook
- Chapter Four workbook resources

#### Media Resources

**Holt Geometry ©2007**

- PowerPoint Presentations
- Textbook On-Line
- Homework Help (on-line)
- Test ExamPro Generator
- One-Stop CD Planner

Kuta Software Geometry Worksheet/Test Generator

#### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **Proofs**.

**Test:** On concepts involving **Geometric Reasoning**.

#### Suggested Instructional Practices

- Note taking skills (guided notes)
### Common Core State Standards

**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.

### Unit Three

**Lines - Parallel/Perpendicular**

- Lines and Angles (**G.CO.1**)
- Angles Formed by Parallel Lines and Transversals (**G.CO.1**)

### Objectives

**The students will be able to**...

- **identify** various types of line relationships.
- **identify** and find measures of angles formed by two lines cut by a transversal.
- **apply** theorems involving angles formed by two lines cut by a transversal.

### Essential Question

How do you determine the measures of all the angles created by two parallel lines cut by a transversal, given only one angle’s measure?

### Teacher Resources

**Holt Geometry ©2007**

- Chapter Three lessons
- Chapter Three Practice Worksheets
- Chapter Three Pre-Made Assessments

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- Chapter Seven from textbook
- Chapter Seven workbook resources

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving Angles and Transversals.

### Suggested Instructional Practices

- Note taking skills (guided notes)
# Common Core State Standards

The students will:

G.CO.9 Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints.

## Unit Three

### Lines - Parallel/Perpendicular

- Proving Lines Parallel (G.CO.9)
- Perpendicular Lines (G.CO.9)

## Objectives

The students will be able to…

- **prove** that two lines are parallel or perpendicular.
- **identify** whether lines are parallel, perpendicular, or neither.

## Essential Question

How do you prove that two lines are parallel?

## Teacher Resources

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Kuta Software Geometry Worksheet/Test Generator

## Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **Parallel and Perpendicular Lines.**

## Suggested Instructional Practices

- Note taking skills (guided notes)
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<td><em>The students will:</em></td>
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<tr>
<td><strong>G.GPE.5</strong> 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).</td>
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<tr>
<td><strong>G.CO.9</strong> Prove theorems about lines and angles. <em>Theorems include:</em> vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints.</td>
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### Unit Three

**Lines - Parallel/Perpendicular**

- Slopes and Lines (**G.GPE.5, G.CO.9**)
- Lines in the Coordinate Plane (**G.GPE.5, G.CO.9**)

### Objectives

- **The students will be able to:**
  - *find* the slope of a line.
  - *identify* whether lines are parallel, perpendicular, or neither.
  - *write* and *graph* lines in various forms.
  - *classify* lines as parallel, intersecting, or coinciding.

### Essential Question

By looking at the equations of two lines, how do you determine whether the lines are parallel, perpendicular, or neither?

### Teacher Resources

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### Assesments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving *Slopes and Lines on the Coordinate Plane.*

**Test:** On concepts involving *Line Parallel/Perpendicular.*

### Suggested Instructional Practices

- Note taking skills (guided notes)
### Common Core State Standards

The students will:

### Unit Four

**Triangle Basics**

- Classifying Triangles
- Angle Relationship in Triangles

### Objectives

The students will be able to...

- **classify** triangles by angle and side measures.
- **use** classification to find missing angles and sides.
- **find** interior or exterior angle measures in triangles.

### Essential Question

How can triangles fall into more than one triangle classification?

### Teacher Resources

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Kuta Software Geometry Worksheet/Test Generator

### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Test:** On concepts involving Triangle Basics.

### Suggested Instructional Practices

- Note taking skills (guided notes)
**Common Core State Standards**

*The students will:*

- **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.
- **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.8** Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

---

**Unit Five**  
**Triangle Congruence**

- Congruent Triangles (*G.CO.6, G.CO.7, G.CO.8*)
- Triangle Congruence (SSS, SAS, ASA, AAS, HL, and CPCTC) (*G.CO.6, G.CO.7, G.CO.8*)

---

**Objectives**

- **The students will be able to…**
  - use properties of congruent triangles.
  - **proof** two triangles congruent. * 
  - **proof** triangles congruent and apply that information to solve problems. *
  - apply congruence rules to parts of congruent triangles.

**Essential Question**

What are the “shortcuts” to prove that two triangles are congruent?

---

**Teacher Resources**

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**Assessments**

- **Homework:** To be given daily on each introduced topic.
- **Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.
- **Quiz:** on concepts involving Triangle Congruence.

---

**Suggested Instructional Practices**

- Note taking skills (guided notes)
<table>
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<th>Objectives</th>
<th>Essential Question</th>
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<tbody>
<tr>
<td>The students will be able to…</td>
<td>What is the difference between the concepts of equilateral and equiangular triangles?</td>
</tr>
<tr>
<td>• <strong>proof</strong> triangles congruent and <strong>apply</strong> that information to solve problems.</td>
<td></td>
</tr>
<tr>
<td>• <strong>apply</strong> congruence rules to parts of congruent triangles.</td>
<td></td>
</tr>
<tr>
<td>• <strong>apply</strong> properties of isosceles and equilateral triangles.</td>
<td></td>
</tr>
<tr>
<td>• <strong>solve</strong> problems involving isosceles and equilateral triangles.</td>
<td></td>
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<tr>
<td><strong>Homework:</strong> To be given daily on each introduced topic.</td>
<td>• Note taking skills (guided notes)</td>
</tr>
<tr>
<td><strong>Class Discussion:</strong> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</td>
<td></td>
</tr>
<tr>
<td><strong>Quiz:</strong> on concepts involving <strong>Isosceles and Equilateral Triangle Properties.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Test:</strong> on concepts involving <strong>Triangle Congruence.</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Geometry (322 and 323) Term Two Week 3

#### Common Core State Standards

The students will:

**G.CO.10** Prove theorems about triangles. *Theorems include:* measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.

### Unit Six

**Triangle Properties and Attributes**

- Perpendicular and Angle Bisectors (G.CO.10)
- Bisectors of Triangles (G.CO.10)
- Circumcenters and Incenters * (G.CO.10)
- Medians and Altitudes of Triangles (G.CO.10)
- Centroids and Orthocenters * (G.CO.10)

### Objectives

The students will be able to...

- **prove** and **apply** theorems involving perpendicular bisectors of segments and angle bisectors.
- **prove** and **apply** properties of perpendicular bisector and angle bisectors of triangles.
- **apply** properties of medians of triangles.
- **apply** properties of altitudes of triangles.
- **find** and **work** the various centers related to triangles. *

### Essential Question

How do you determine the circumcenter, centroid, and the orthocenter of a triangle?

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving Centers of Triangles.

### Suggested Instructional Practices

- Note taking skills (guided notes)
The students will:

**G.SRT.4** Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.

**G.SRT.5** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

### Unit Six

**Triangle Properties and Attributes**

- The Triangle Midsegment Theorem (**G.SRT.4**)
- Inequalities in One Triangle (**G.SRT.5**)
- Inequalities in Two Triangles (**G.SRT.5**)

### Objectives

The students will be able to…

- **prove and use** properties of triangle midsegments.
- **apply** inequalities in one triangle.
- **apply** inequalities in two triangles.

### Essential Question

How do you determine whether three segments can make up the sides of a triangle?

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **Inequalities with Triangles.**

**Benchmark Assessment 1:** The **Benchmark Assessment** will focus on all **Geometry Concepts** covered to date.

### Suggested Instructional Practices

- Note taking skills (guided notes)
The students will:

**G.SRT.4** Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.*

**G.SRT.5** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

### Unit Six
**Triangle Properties and Attributes**

- The Pythagorean Theorem (**G.SRT.4, G.SRT.5**)
- Applying Special Right Triangles (**G.SRT.4, G.SRT.5**)

### Objectives
The students will be able to...

- **use** the Pythagorean Theorem and its converse to solve various problems.
- **use** the Pythagorean inequalities to classify triangles.
- **apply** properties of $45^\circ - 45^\circ - 90^\circ$ triangles.
- **apply** properties of $30^\circ - 60^\circ - 90^\circ$ triangles.

### Essential Question
How do you determine the classification of triangle using the concept of Pythagorean inequalities?

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### Assessments
**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Test:** on concepts involving Triangle Properties and Attributes.

### Suggested Instructional Practices
- **GEO.2012. #2** Special Right Triangle Applications
- **GEO.2012. #3** Pythagorean Theorem Applications
- Note taking skills (guided notes)
**Geometry (322 and 323) Term Two Week 6**

**Common Core State Standards**

The students will:

**G.CO.3** Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.

**G.C.MA.3a** Derive the formula for the relationship between the number of sides and sums of the interior and sums of the exterior angles of polygons and apply to the solutions of mathematical and contextual problems.

**Unit Seven Properties of Polygons and Quadrilaterals**

- Properties of Polygons (G.CO.3, G.C.MA.3a)
- Attributes of Polygons (G.CO.3, G.C.MA.3a)
- Properties of Parallelograms (G.CO.3, G.C.MA.3a)

**Objectives**
The students will be able to…

- **classify** polygons based on their sides and angle measure.
- **find** the measures of interior and exterior angles of polygons.
- **work** with interior and exterior angle sums of polygons.
- **prove** and **apply** properties of parallelograms.

**Essential Question**
Given a quadrilateral, how is it determined that it is a parallelogram?

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**Assessments**

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **Polygons**.

**Suggested Instructional Practices**

- Note taking skills (guided notes)
### Geometry (322 and 323) Term Two Week 7

**Common Core State Standards**

The students will:

**G.CO.3** Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.

**G.CO.11** Prove theorems about parallelograms. *Theorems include:* opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

### Unit Seven Properties of Polygons and Quadrilaterals

- Conditions of Parallelograms (G.CO.3, G.CO.11)
- Properties of Special Parallelograms (G.CO.3, G.CO.11)
- Conditions of Special Parallelograms (G.CO.3, G.CO.11)

### Objectives

The students will be able to...

- **prove** that a quadrilateral is a parallelogram.
- **prove** and use properties of rectangles, squares, and rhombi.
- **prove** that a given quadrilateral is a square, rectangle, or rhombus. *
- **apply** rules of special parallelograms.

### Essential Question

How do you determine which special parallelogram is given using the properties and not a figure of the parallelogram?

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **Parallelograms.**

### Suggested Instructional Practices

- Note taking skills (guided notes)
The students will:

**G.CO.3** Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.

**G.CO.11** Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

### Unit Seven
Properties of Polygons and Quadrilaterals
- Properties of Trapezoids (G.CO.3)
- Properties of Kites (G.CO.3)
- Review of all Polygon and Quadrilaterals (G.CO.3, G.CO.11)

### Objectives

**The students will be able to...**
- **identify** and **use** properties of kites to solve problems.
- **identify** and **use** properties of trapezoids to solve problems.

### Essential Question

Why is a trapezoid not a special parallelogram, each though it has parallel sides?

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Test:** on concepts involving **Properties of Polygons and Quadrilaterals.**

**Mid-Year Exam:** This will cover all of the concepts from semester one.

### Suggested Instructional Practices

- Note taking skills (guided notes)
### Common Core State Standards

**G.SRT.1**  
Verify experimentally the properties of dilations given by a center and a scale factor:  
\( a. \) A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.  
\( b. \) The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

**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.3**  
Use the properties of similarity transformations to establish the Angle-Angle (AA) criterion for two triangles to be similar.

### Unit Eight  
**Similarity**

- Ratios and Proportions (G.SRT.1, G.SRT.2, G.SRT.3)
- Ratios in Similar Polygons (G.SRT.1, G.SRT.2, G.SRT.3)

### Objectives

**The students will be able to…**

- **write** and **simplify** ratios.
- **set** proportions of use them to solve problems.
- **identify** two polygon as similar.
- **solve** problems by applying properties of similar polygons.

### Essential Question

How are the concepts of similarity and congruence related to each other?

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### Assessments

**Homework:** To be given daily on each introduced topic.  
**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.  
**Quiz:** on concepts involving Ratios and Polygons.

### Suggested Instructional Practices

- Note taking skills (guided notes)
### Geometry (322 and 323) Term Three Week 2

**Common Core State Standards**

The students will:

**G.SRT.1** Verify experimentally the properties of dilations given by a center and a scale factor:
- a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
- b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

**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.3** Use the properties of similarity transformations to establish the Angle-Angle (AA) criterion for two triangles to be similar.

---

### Unit Eight
**Similarity**

- Triangle Similarity: AA, SSS and SAS. (G.SRT.1, G.SRT.2, G.SRT.3)
- Applying Properties of Similar Triangles (G.SRT.1, G.SRT.2, G.SRT.3)

---

### Objectives
The students will be able to...

- **proof** certain triangles are similar using various methods.
- **solve** problems involving similar triangles.
- **use** properties of similar triangles to find segment lengths.
- **apply** properties involving similar triangles.

---

### Essential Question
Why is it unnecessary to have either an AAS or ASA theorem to prove two triangles are similar?

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **Triangle Similarity**.

---

### Suggested Instructional Practices

- Note taking skills (guided notes)
# Geometry (322 and 323) Term Three Week 3

## Common Core State Standards

**G.SRT.1** Verify experimentally the properties of dilations given by a center and a scale factor:

a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.

b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

**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.3** Use the properties of similarity transformations to establish the Angle-Angle (AA) criterion for two triangles to be similar.

## Unit Eight

**Similarity**

- Using Proportional Relationships (G.SRT.1, G.SRT.2, G.SRT.3)
- Dilations and Similarity in the Coordinate Plane (G.SRT.1, G.SRT.2, G.SRT.3)

## Objectives

**The students will be able to…**

- **use** ratios to make indirect measurements.
- **draw** scale drawings and **use** scale drawings to solve problems.
- **apply** similarity properties in the coordinate plane.
- **use** the coordinate plane to prove two figures are similar.

## Essential Question

How is the concept of similarity used to make scale drawings?

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## Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving Proportional Relationships.

**Test:** On concepts involving Similarity.

## Suggested Instructional Practices

- Note taking skills (guided notes)
# Geometry (322 and 323)  
## Term Three  
### Week 4

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<tr>
<td><strong>The students will:</strong></td>
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<td><strong>G.MG.1</strong> Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).</td>
</tr>
<tr>
<td><strong>G.MG.2</strong> Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).</td>
</tr>
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</table>

## Unit Nine  
### Two Dimensional Measurements
- Triangle and Quadrilateral (Area and Perimeter) (*G.MG.1, G.MG.2*)
- Circles (Area and Circumference) (*G.MG.1, G.MG.2*)
- Area and Perimeter of Composite Figures (*G.MG.1, G.MG.2*)

### Objectives
**The students will be able to...**
- **find** the area and perimeter of triangles.
- **find** the area and perimeter of various quadrilaterals.
- **find** the area and circumference of circles.
- **find** the area and perimeter of regular polygons.
- **find** the area and perimeter of composite figures.

### Essential Question
How is the concept of the Pythagorean Theorem important in finding the areas of quadrilaterals?

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## Assessments
**Homework:** To be given daily on each introduced topic.  
**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.  
**Quiz:** on concepts involving **Area and Perimeter**.  
**Benchmark Assessment 2:** The **Benchmark Assessment** will focus on all **Algebra II Concepts** covered to date.

## Suggested Instructional Practices
- **GEO.2012. #4** Area as a Function of an Angle  
- Note taking skills (guided notes)
### Geometry (322 and 323) Common Core State Standards

*The students will:*

- **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).

### Unit Nine

**Two Dimensional Measurements**

- Area and Perimeter of Regular Polygons (Equilateral Triangle, Square, and Regular Hexagon w/o Right Triangle Trigonometry) *(G.MG.1, G.MG.2)*
- Area and Perimeter of Coordinate Plane *(G.MG.1, G.MG.2)*
- Effects of Changing Dimensions Proportionally *(G.MG.1, G.MG.2)*

### Objectives

*The students will be able to...*

- **find** the area and perimeter of regular polygons.
- **find** the perimeter and area of figures in the coordinate plane.
- **find** the approximate area of unknown figures.
- **describe** the effect on perimeter and area when one or more dimension of a figure is changed.

### Essential Question

Why does tripling the radius of a circle not triple the area of the resulting circle?

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **Change of Dimension Applications.**

### Suggested Instructional Practices

- Note taking skills (guided notes)
**Common Core State Standards**

The students will:

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 $P(A \text{ and } B)/P(B)$, 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 $B$. ★

S.CP.4 Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.

S.CP.5 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.

S.CP.6 Find the conditional probability of $A$ given $B$ as the fraction of $B$’s outcomes that also belong to $A$, and interpret the answer in terms of the model. ★

S.CP.7 Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model. ★

S.CP.8 (+) Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B|A) = P(B)P(A|B)$, 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. ★

SMD.6 (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator). ★

SMD.7 (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).

---

**Unit Nine**

**Two Dimensional Measurements**

- Probability Review (all standards listed above)
- Geometric Probability (all standards listed above)

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Essential Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>The students will be able to…</td>
<td>How do you determine the geometric probability of a variety of events occurring?</td>
</tr>
<tr>
<td>• review the vocabulary and calculate the probabilities of simple events occurring based on information.</td>
<td></td>
</tr>
<tr>
<td>• determine the basic probabilities of events involving geometric models.</td>
<td></td>
</tr>
<tr>
<td>• determine geometric probability.</td>
<td></td>
</tr>
</tbody>
</table>

**Teacher Resources**

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- Chapter Nine lessons
- Chapter Nine Practice Worksheets
- Chapter Nine Pre-Made Assessments
  Prentice Hall Geometry ©1998
- Chapter Five from textbook
- Chapter Five workbook resources

**Media Resources**

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- PowerPoint Presentations
- Textbook On-Line
- Homework Help (on-line)
- Test ExamPro Generator
- One-Stop CD Planner

Kuta Software Geometry Worksheet/Test Generator

**Assessments**

Homework: To be given daily on each introduced topic.

Class Discussion: Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

Quiz: on concepts involving Geometric Probability

Test: On concepts involving Two Dimensional Measurements.

**Suggested Instructional Practices**

- GEO. 2012 #5 Geometric Probability
- Note taking skills (guided notes)
The students will:

**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.

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<tr>
<th>Unit Ten</th>
<th>Three Dimensional Measurements</th>
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<tr>
<td></td>
<td>• Solid Geometry (<strong>G.GMD.4</strong>)</td>
</tr>
<tr>
<td></td>
<td>• Representations of Three Dimensional Figures (<strong>G.GMD.4</strong>)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Essential Question</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The students will be able to…</strong></td>
<td>Why are various representations of three-dimensional figures used to help visualize different three-dimensional figures?</td>
</tr>
<tr>
<td>• <strong>classify</strong> three-dimensional figures by using their properties.</td>
<td></td>
</tr>
<tr>
<td>• <strong>use</strong> nets and cross sections to analyze three-dimensional figures.</td>
<td></td>
</tr>
<tr>
<td>• <strong>draw</strong> or recognize various representations of three-dimensional figures.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Teacher Resources</th>
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<tr>
<th>Assessments</th>
<th>Suggested Instructional Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Homework:</strong> To be given daily on each introduced topic.</td>
<td><strong>GEO.2012. #6</strong> Visualizing Solids of Revolutions</td>
</tr>
<tr>
<td><strong>Class Discussion:</strong> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</td>
<td><strong>Note taking skills</strong> (guided notes)</td>
</tr>
<tr>
<td><strong>Quiz:</strong> on concepts involving <strong>Solid Geometry</strong>.</td>
<td></td>
</tr>
</tbody>
</table>
Common Core State Standards

**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. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*

**G.GMD.2** Give an informal argument using Cavalieri’s principle for the formulas for the volume of a sphere and other solid figures.

**G.GMD.3** Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

**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.

**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).

---

**Unit Ten**

**Three Dimensional Measurements**

- Representations of Three-Dimensional Figures (**G.MG.1, G.GMD.4**)
- Formulas in Three-Dimensional Space (**G.GMD.1, G.GMD.3, G.MG.2**)
- Surface/Lateral Area (Cylinders, Prisms, Cones, Pyramids, and Spheres) (**G.GMD.1, G.GMD.2, G.GMD.3, G.MG.2**)
- Volumes (Cylinders, Prisms, Cones, Pyramids, and Spheres) (**G.GMD.1, G.GMD.2, G.GMD.3, G.MG.2**)

---

**Objectives**

- The students will be able to...
  - **draw** or recognize various representations of three-dimensional figures.
  - **find** the surface areas of prisms and cylinders.
  - **find** the surface areas of pyramids and cones.
  - **find** the surface areas of spheres.
  - **solve** problems involving the concepts of surface area.
  - **find** the volumes of prisms and cylinders.

---

**Essential Question**

What is the difference between lateral surface area and total surface area?

---

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---

**Assessments**

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

---

**Suggested Instructional Practices**

- Note taking skills (guided notes)
**Common Core State Standards**

- **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. *Use dissection arguments, Cavalieri’s principle, and informal limit arguments.*
- **G.GMD.2(+)** Give an informal argument using Cavalieri’s principle for the formulas for the volume of a sphere and other solid figures.
- **G.GMD.3** Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
- **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. (10.G.10/G.G.16)
- **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).

### Unit Ten

**Three Dimensional Measurements**

- Volumes (Cylinders, Prisms, Cones, Pyramids, and Spheres) (**G.GMD.1, G.GMD.2, G.GMD.3, G.MG.2**)
- Comparing Surface Areas and Volumes (**G.GMD.1, G.GMD.2, G.GMD.3, G.MG.2**)

### Objectives

- **The students will be able to…**
  - **find** the volumes of prisms and cylinders.
  - **find** the volumes of pyramids and cones.
  - **find** the volumes of spheres.
  - **solve** problems involving the concepts of volume.
  - **focus** on how changing dimensions effect the resulting figure.

### Essential Question

Cones are not classified as a special type of pyramids, but why is it okay to think of cones as pyramids?

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- Test ExamPro Generator
- One-Stop CD Planner

Kuta Software Geometry Worksheet/Test Generator

### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Test:** on concepts involving **Three Dimensional Measurements**.

### Suggested Instructional Practices

- Note taking skills (guided notes)
**Geometry (322 and 323)**  
**Term Four**  
**Week 1**

### Common Core State Standards

**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 Eleven

**Transformational Geometry**

- Reflections (**G.CO.4, G.CO.5**)
- Translations (**G.CO.4, G.CO.5**)
- Rotations (**G.CO.4, G.CO.5**)
- Composition of Transformations (**G.CO.4, G.CO.5**)

### Objectives

The students will be able to...

- **identify** and **draw** line reflections.
- **identify** and **draw** translations.
- **identify** and **draw** rotations
- **work** with isometries.
- **identify** and **draw** compositions of transformations.
- **identify** and **draw** glide reflections.

### Essential Question

How do you determine the vector associated with a translation, given the preimage and image?

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **Transformations.**

### Suggested Instructional Practices

- Note taking skills (guided notes)
<table>
<thead>
<tr>
<th>Geometry (322 and 323)</th>
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<th>Week 2</th>
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</thead>
<tbody>
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<td><strong>Common Core State Standards</strong></td>
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<tr>
<td>The students will:</td>
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<td>G.CO.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.</td>
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<td>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.</td>
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</tbody>
</table>

| **Unit Eleven** | | |
| **Transformational Geometry** | | |
| • Symmetry (G.CO.4, G.CO.5) | | |
| • Tessellations (G.CO.4, G.CO.5) | | |
| • Dilations (G.CO.4, G.CO.5) | | |

| **Objectives** | | |
| **The students will be able to...** | **Essential Question** | |
| • identify and describe symmetry in geometric figures. To use transformations to draw tessellations. | How do you determine whether a tessellation is regular, semi-regular, or neither? | |
| • identify regular and semi-regular tessellations. | | |
| • determine if a figure will tessellate. | | |
| • identify and draw dilations. | | |

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| • Chapter Twelve Practice Worksheets | | |
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| • Test ExamPro Generator | | |
| • One-Stop CD Planner | | |
| Kuta Software Geometry Worksheet/Test Generator | | |

<p>| <strong>Assessments</strong> | | |
| <strong>Homework:</strong> To be given daily on each introduced topic. | <strong>Suggested Instructional Practices</strong> | |
| <strong>Class Discussion:</strong> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion. | <strong>Note taking skills (guided notes)</strong> | |
| <strong>Quiz:</strong> on concepts involving Symmetry and Tessellations | | |</p>
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<td><strong>Unit Eleven</strong></td>
<td><strong>Transformational Geometry</strong></td>
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<tr>
<td>• Review of all Transformational Geometry concepts. (G.CO.4, G.CO.5)</td>
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<tr>
<td><strong>Objectives</strong></td>
<td>How are transformations related to symmetry and tessellations?</td>
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</tr>
<tr>
<td>Test: On concepts involving Transformational Geometry.</td>
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</tbody>
</table>
**Common Core State Standards**

The students will:

**G.C.1** Prove that all circles are similar.

**G.C.2** Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.

**G.C.3** Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

**G.C.4** (+) Construct a tangent line from a point outside a given circle to the circle.

---

### Unit Twelve

**Circle Concepts**

- Lines that Intersect Circles (G.C.1, G.C.2, G.C.3, G.C.4)
- Arcs and Chords (G.C.1, G.C.2, G.C.3, G.C.4)

### Objectives

The students will be able to…

- **identify** tangents, secants, and chords.
- **solve** problems involving tangent concepts.
- **apply** properties of arc and chords.
- **find** the degrees of arcs and lengths of chords.

### Essential Question

How does it matter where the lines that intersect a circle, intersect each other, in relation to the circle?

---

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **A arcs and Chords**.

---

### Suggested Instructional Practices

- Note taking skills (guided notes)
**Geometry (322 and 323)**

**Term Four**

**Week 4**

**Common Core State Standards**

The students will:

**G.C.2** Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*

**G.C.3** Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

**G.C.4 (+)** Construct a tangent line from a point outside a given circle to the circle.

**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.

### Unit Twelve

**Circle Concepts**

- Sector Area (G.C.2, G.C.3, G.C.4, G.C.5)

### Objectives

**The students will be able to…**

- **find** the area of a sector.
- **find** the area of a segment.
- **find** the length of an arc.
- **find** the measure of an inscribed angle and use the properties of inscribed angles to solve problems.

### Essential Question

How does the concept of pie chart relate to the concept of sector area?

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving Circle Concepts.

**Benchmark Assessment 3:** The Benchmark Assessment will focus on all Geometry Concepts covered to date.

### Suggested Instructional Practices

- Note taking skills (guided notes)
### Common Core State Standards

The students will:

**G.C.2** Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.

**G.C.3** Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

**G.C.4** (+) Construct a tangent line from a point outside a given circle to the circle.

### Unit Twelve

**Circle Concepts**

- Segment Relationships in Circles (G.C.2, G.C.3, G.C.4)
- Circles in the Coordinate Plane (G.C.2, G.C.3, G.C.4)

### Objectives

The students will be able to...

- **find** the measures of angles formed by lines that intersect circles and solve related problems.
- **find** the lengths of segments formed by lines that intersect circles and use the lengths to solve related problems.
- **write** the equation of a circle in the coordinate plane.
- **use** the equation of a circle to graph the circle and solve related problems.

### Essential Question

How does the distance formula related to the equation of a circle?

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving Circle Relationships.

### Suggested Instructional Practices

- Note taking skills (guided notes)
**Common Core State Standards**

**G.C.1** Prove that all circles are similar.

**G.C.2** Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*

**G.C.3** Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

**G.C.4** (+) Construct a tangent line from a point outside a given circle to the circle.

**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.

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**Unit Twelve**

**Circle Concepts**


**Objectives**

The students will be able to…

- **demonstrate** an understanding of all of the introduced circle concepts.

**Essential Question**

How do you use the properties and theorems involving circles to calculate the measures of angles relating to circles?

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**Teacher Resources**

*Holt Geometry ©2007*

- Chapter Eleven lessons
- Chapter Eleven Practice Worksheets
- Chapter Eleven Pre-Made Assessments

*Prentice Hall Geometry ©1998*

- Chapter Twelve from textbook
- Chapter Twelve workbook resources

**Media Resources**

*Holt Geometry ©2007*

- PowerPoint Presentations
- Textbook On-Line
- Homework Help (on-line)
- Test ExamPro Generator
- One-Stop CD Planner

Kuta Software Geometry Worksheet/Test Generator

**Assessments**

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Test:** on concepts involving Circle Concepts.

**Suggested Instructional Practices**

- GEO.2012.#7 Why is a tangent called tangent circles?
- Note taking skills (guided notes)
## Common Core State Standards

*The students will:*  
**G.SRT.6** Understand that by similarity, 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.  
**G.SRT.8** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

### Unit Thirteen  
**Right Triangles/Trigonometry**  
- Similarity in Right Triangles *(G.SRT.6, G.SRT.7, G.SRT.8)*  
- Trigonometric Ratios *(G.SRT.6, G.SRT.7, G.SRT.8)*

### Objectives

*The students will be able to…*
- **apply** the concept of similarity relationships in right triangles to solve problems. *
- **find** the sine, cosine, and tangent of an acute angle.  
- **use** trigonometric ratios to find the lengths of sides in right triangles.

### Essential Question

How to you use trigonometric ratios to find missing side lengths in right triangles?

### Teacher Resources

*Holt Geometry ©2007*
- Chapter Eight lessons  
- Chapter Eight Practice Worksheets  
- Chapter Eight Pre-Made Assessments

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- Chapter Eleven from textbook  
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### Media Resources

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- One-Stop CD Planner

Kuta Software Geometry Worksheet/Test Generator

### Assessments

**Homework:** To be given daily on each introduced topic.  
**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

### Suggested Instructional Practices

- Note taking skills (guided notes)
**Common Core State Standards**

**G.SRT.6** Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. (G.G.9)

**G.SRT.7** Explain and use the relationship between the sine and cosine of complementary angles. (G.G.9)

**G.SRT.8** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. (10.G.6/G.G.8/G.G.9)

**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. (10.M.1/G.M.1)

**G.SRT.10** (+) Prove the Laws of Sines and Cosines and use them to solve problems.

**G.SRT.11** (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

### Unit Thirteen

**Right Triangles/Trigonometry**

- Solving Right Triangles (**G.SRT.6, G.SRT.7, G.SRT.8**)
- Angles of Elevation and Depression (**G.SRT.6, G.SRT.7, G.SRT.8**)
- Area of a Triangle Using Sine (**G.SRT.9, G.SRT.10, G.SRT.11**)

#### Objectives

**The students will be able to…**

- **use** trigonometric ratios to find the lengths of sides in right triangles and in real world situations.
- **solve** problems involving angles of elevations and depression.
- **use** the sine function to find the area of a triangle drawing an auxiliary line.

#### Essential Question

What happens to the angle of elevation from your eye to the top of a structure as you walk toward the structure?

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Kuta Software Geometry Worksheet/Test Generator

#### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Quiz:** on concepts involving **Trigonometric Concepts.**

#### Suggested Instructional Practices

- Note taking skills (guided notes)
### Common Core State Standards

**The students will:**

- **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. (10.M.1/G.M.1)
- **G.SRT.10** (+) Prove the Laws of Sines and Cosines and use them to solve problems.
- **G.SRT.11** (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

### Unit Thirteen

**Right Triangles/Trigonometry**

- The Law of Sines (G.SRT.9, G.SRT.10, G.SRT.11)
- The Law of Cosines (G.SRT.9, G.SRT.10, G.SRT.11)

### Objectives

The students will be able to...

- **use** the Law of Sines or the Law of Cosines to find unknown angle and side measures of triangles.
- **apply** the Law of Sines or the Law of Cosines to solve real world problems involving triangles.

### Essential Question

How are the Laws of Sine and Cosine used to expand the concepts included in right triangle trigonometry?

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- One-Stop CD Planner

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### Assessments

**Homework:** To be given daily on each introduced topic.

**Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.

**Test:** On concepts involving **Right Triangles/Trigonometry**

**Final Exam:** This will cover all of the concepts from semester one and two.

### Suggested Instructional Practices

- GEO.2012.#8 Trigonometric Applications
- Note taking skills (guided notes)