### Essential Content & Understanding:

**A. Points, Lines, and Planes**
1. Explain the concept of undefined terms.
2. Explain collinear and coplanar points.
3. Define segments, lines, and rays.
4. Show Intersection of geometric figures.
   - segments, lines, rays
   - lines and planes

**B. Segments, Angles and Their Measures**
1. Introduce postulates (axioms)
2. Measurement
   - a) Find distance between two points on a number line.
   - b) Use Distance Formula - to find distance between two points in the coordinate plane
   - c) Measure angles using protractor
3. Classify angles by their measures:
   - acute, right, obtuse and straight

**C. Segment and Angle Bisectors**
1. Find the midpoint of a segment
2. Bisect an angle
3. Use Midpoint Formula
4. Angle Pair Relationships
   1) Introduce vertical angles and linear pair
   2) Review complementary and supplementary angles

**D. Review perimeter, circumference & area**

### Essential Questions:

What are the fundamental properties of geometry and where and how have you seen these concepts used in the real-world?

### Resources/Links:

1. **Resources for Prentice Hall Geometry**
   Copyright 2011 Pearson Education (including remediation, extra practice, companion notes, enrichment, activities and projects):

2. **Teaching/Learning Strategies**
   a) Kagan Strategies:
      - Rally Robin
      - Sage and Scribe
      - Showdown for review before test
   b) Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts

3. **Enrichment Opportunities**
   a) *Patty Paper Geometry* by Michael Serra
      Copyright 1994 Key Curriculum Press
      - Intersection of two lines
      - Folding an angle bisector
      - Folding a perpendicular bisector of a line segment
2012-2013 Instructional Curriculum Plan  Grade: 10th  Course: Geometry

Unit 2: Reasoning and Proof
(Sections 2.1, 2.2, 2.3 and 2.4)

Instructional Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.


MA.912.G.8.4: Make conjectures with justifications about geometric ideas. Distinguish between information that supports a conjecture and the proof of a conjecture.

EduSoft Mini-Assessment(s):
www.edusoft.com

Date Range: Given during the instruction per the outline in this section

Key Vocabulary:
conjecture, counterexample, bi-conditional, conclusion, contrapositive, converse, hypothesis, inverse, negation, theorem, deductive reasoning, two-column proof

Learning Goal:
Students will learn inductive and deductive reasoning and will be introduced to topics related to reasoning.

Objectives:
1. Make predictions based on observations using inductive reasoning.
2. Recognize and analyze conditional statements, and write inverses, converses, and contra-positives.
3. Write bi-conditions and recognize good definitions.
4. Write geometric proofs by using two-column and paragraph proofs.
5. Prove segment and angle relationships by reasoning with postulates and theorems.
6. Use the Law of Detachment and Law of Syllogism to develop conclusions.

Common Core:

Linked Standards with Access Points:

Essential Content & Understanding:
A. Patterns and Inductive Reasoning
1. Describe visual and number patterns.
2. Use inductive reasoning:
   a) make a conjecture
   b) find a counterexample
B. Conditional Statements
1. State in if-then form
2. State the converse
3. State the inverse
4. State the contra-positive
5. Introduce the point, line and plane postulates.
C. Definitions and Bi-conditionals
1. Restate a definition into if-then form.
2. Write definitions and postulates as bi-conditional (if-and-only-if form)
D. Deductive Reasoning – using symbolic notation
1. Using properties from Algebra
2. Prove statements about segments and angles
   a) write two-column proofs
   b) b. write paragraph proof

Essential Questions:
When writing conjectures, what can the truth values tell you about the if-then form?

Resources/Links:
1. Resources for Prentice Hall Geometry
   Copyright 2011 Pearson Education (including remediation, extra practice, companion notes, enrichment, activities and projects):
   https://www.pearsonsuccessnet.com/snpapp/login/login.jsp

2. Teaching/Learning Strategies:
   a) Kagan Strategies:
      a) Rally Robin
      b) Sage and Scribe
   b) All Write Round Robin for writing conditional, converse, inverse and contrapositive statements
      d) Showdown for review before test
   c) Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts
2012-2013 Instructional Curriculum Plan  
Grade: 10th  Course: Geometry

Unit 3: Perpendicular and Parallel Lines
(Sections 3.1, 3.2, 3.3, 3.4 and 3.8)

Time Allowed:
5 days (Block)
10 days

Instructional Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

MA.912.G.1.3: Identify and use the relationships between special pairs of angles formed by parallel lines and transversals.

EduSoft Mini-Assessment(s):
www.edusoft.com

Date Range: Given during the instruction per the outline in this section

Key Vocabulary:
skew

Learning Goal:
Students will expand and refine their knowledge and skills related to parallel and perpendicular lines.

Objectives:
1. Identify relationships between figures in space.
2. Identify angles formed by two lines and a transversal.
3. Use properties of parallel lines to find angle measures and to determine whether two lines are parallel.
4. Relate parallel and perpendicular lines and their slopes.

Common Core: (link to common core)
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/congruence/

Linked Standards with Access Points:

MA.912.G.1.2: Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass or a drawing program, explaining and justifying the process used.

MA.912.G.1.3: Identify and use the relationships between special pairs of angles formed by parallel lines and transversals.

MA.912.G.8.5: Write geometric proofs, including proofs by contradiction and proofs involving coordinate geometry. Use and compare a variety of ways to present deductive proofs, such as flow charts, paragraphs, two-column, and indirect proofs.

Essential Content & Understanding:
A. Lines and Angles
1. Parallel and skew lines
2. Angles formed by transversals
   a) corresponding angles
   b) alternate exterior angles
   c) alternate interior angles
   d) consecutive interior angles
   e) same-side interior angles
B. Parallel Lines with transversals
1. Corresponding angles postulate
2. Theorems about parallel lines
3. Slope of a Line
   a) slope of parallel lines
4. Proving Parallel Lines
5. Properties of Parallel Lines
C. Proof and Perpendicular Lines
1. Introduction to flow proof
2. Prove characteristics of perpendicular lines
   a) Lines
D. Lines in The Coordinate Plane:
1. Parallel and
2. Perpendicular
   a) a. slope of perpendicular lines

Essential Questions:
How are special angles formed by a transversal used to prove two lines are parallel?

Resources/Links:
1. Resources for Prentice Hall Geometry
   Copyright 2011 Pearson Education (including remediation, extra practice, companion notes, enrichment, activities and projects): https://www.pearsonsuccessnet.com/snpapp/login/login.jsp
2. Teaching/Learning Strategies:
   a) Kagan Strategies:
      a) Rally Robin
      b) Sage and Scribe
      c) Showdown for review before test
   b) Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts
   c) Pasta representation: spaghetti for parallel lines and macaroni for angles (hands-on practice and visuals)
### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

- **MA.912.G.2.2:** Determine the measures of interior and exterior angles of polygons, justifying the method used.
- **MA.912.G.2.3:** Use properties of congruent and similar polygons to solve mathematical or real-world problems.
- **MA.912.G.4.6:** Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.

### Learning Goal:

Students will learn methods to prove triangles are congruent.

### Objectives:

1. Classify triangles by their sides and angles.
2. Prove triangles are congruent, given information about their sides and angles (SSS, SAS, ASA, AAS and HL).
3. Use triangle congruence and corresponding parts to prove other parts of triangles congruent.
4. Use congruent triangles to solve real-world problems.

### Common Core:

http://www.corestandards.org/the-standards/mathematics/high-school-geometry/congruence/

### Linked Standards with Access Points:

- **MA.912.G.2.2:** Determine the measures of interior and exterior angles of polygons, justifying the method used.
- **MA.912.G.2.3:** Use properties of congruent and similar polygons to solve mathematical or real-world problems.
- **MA.912.G.4.1:** Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.
- **MA.912.G.4.3:** Construct triangles congruent to given triangles.
- **MA.912.G.4.6:** Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.

### Essential Content & Understanding:

#### A. Triangles and Angles

1. **Classify triangles by sides**
   - a) equilateral
   - b) isosceles
   - c) scalene

2. **Classify triangles by angles**
   - a) acute
   - b) equiangular
   - c) right
   - d) obtuse

3. **Use angle measures of triangles**
   - a) Triangle sum theorem
   - b) Exterior angle theorem

#### B. Congruence and Triangles

1. **SSS congruence postulate**
2. **SAS congruence postulate**
3. **ASA congruence postulate**
4. **AAS congruence theorem**
5. **Proving congruent triangles**
6. **Using CPCTC**
7. **Isosceles, Equilateral, and Right Triangles**
   - 1. **The Base Angle Theorem**
   - 2. **Proving right triangles congruent with HL**

### Essential Questions:

How do the postulates and theorem for congruent triangles shorten the time and work involved in proofs?

### Resources/Links:

Resources for Prentice Hall Geometry
Copyright 2011 Pearson Education (including remediation, extra practice, companion notes, enrichment, activities and projects):
[https://www.pearsonsuccessnet.com/snpapp/login/login.jsp](https://www.pearsonsuccessnet.com/snpapp/login/login.jsp)

### Teaching/Learning Strategies:

- **Kagan Strategies:**
  - a) Rally Robin
  - b) Sage and Scribe
  - c) All Write Round Robin for proofs
  - d) Showdown for review before test
- **Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts**
- **Use manipulatives to represent angles and sides of triangles such asangs for students to see congruence.
Instructional Focus Benchmarks

The benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

**MA.912.G.4.2:** Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors, orthocenter, centroid, in-center, and circum-center.

**MA.912.G.4.5:** Apply theorems involving segments divided proportionally.

**MA.912.G.4.7:** Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem.

**EduSoft Mini-Assessment(s):**

www.edusoft.com

**Date Range:** Given during the instruction per the outline in this section

**Key Vocabulary:**

Circum-center, in-center, centroid, orthocenter

---

**Learning Goal:**

Students will learn relationships within triangles.

**Objectives:**

1. Use properties of mid-segments, perpendicular bisectors and angle bisectors to solve problems.
2. Identify points of concurrency in triangles (circum-center, in-center, centroid and orthocenter).
3. Use inequalities involving angles and sides of triangles.
4. Apply inequalities in one and two triangles.

**Common Core:**

http://www.corestandards.org/the-standards/mathematics/high-school-geometry/congruence/

**Linked Standards with Access Points:**

**MA.912.G.4.2:** Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors, orthocenter, centroid, in-center, and circum-center.

**MA.912.G.4.5:** Apply theorems involving segments divided proportionally.

**MA.912.G.4.7:** Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem.

**Essential Content & Understanding:**

**A. Perpendicular and Angle Bisectors**

1. State and apply the Perpendicular Bisector Theorem and its Converse.
2. Define: a point equidistant from 2 points.
3. State and apply the Angle Bisector Theorem and its Converse by using the definitions:
   - a) distance from a point to a line
   - b) a point equidistant from 2 lines.

**B. Bisectors in Triangles**

1. State and apply the concurrency of the Perpendicular Bisectors Theorem
2. State and apply the concurrency of angle bisectors.

**C. Medians and Altitudes**

1. Define and apply: Median of a triangle and the centroid.
2. Define and apply: Altitudes of triangles and the orthocenter.

**D. The Mid-segment Theorem**

1. Define: The Mid-segment of a triangle.
2. State and apply: Properties of Mid-segments.

**E. The Hinge Theorem**

1. Apply the Hinge Theorem

**Essential Questions:**

Where and how are relationships within triangles used in real-world situations?

**Resources/Links:**

1. Resources for Prentice Hall Geometry
   Copyright 2011 Pearson Education (including remediation, extra practice, companion notes, enrichment, activities and projects):
   https://www.pearsonsuccessnet.com/snpapp/login/login.jsp

2. Teaching/Learning Strategies:
   a) Kagan Strategies:
      - Rally Robin
      - Sage and Scribe
      - Showdown for review before test
   b) Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts

3. Enrichment Opportunities
   a) Patty Paper Geometry by Michael Serra
      Copyright 1994 Key Curriculum Press
      - Create circum-center with perpendicular bisectors of a triangle
   b) Create in-center with angle bisectors of triangle
   c) Create centroid with medians of a triangle
### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

- **MA.912.G.2.2**: Determine the measures of interior and exterior angles of polygons, justifying the method used.
- **MA.912.G.3.3**: Use coordinate geometry to prove properties of congruent, regular, and similar quadrilaterals.
- **MA.912.G.3.4**: Prove theorems involving quadrilaterals.

### EduSoft Mini-Assessment(s):

[www.edusoft.com](http://www.edusoft.com)

### Date Range: Given during the instruction per the outline in this section

### Key Vocabulary:
- isosceles trapezoid, kite, mid-segment of a trapezoid, convex, concave, rhombus, midpoint formula

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### Instructional Curricular Plan

**Unit 6: Quadrilaterals**

(Sections 6.2, 6.3, 6.4, 6.6, and 6.7)

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### Learning Goal:

Students examine properties of quadrilaterals and discern differences.

### Objectives:

1. Classify quadrilaterals (parallelograms, rectangles, rhombuses, squares, kites, and trapezoids) according to their properties.
2. Compute interior and exterior angle measures of polygons.
3. Write proofs about quadrilaterals using their properties as reasons.

### Common Core:

- [Expression of geometric properties with equations](http://www.corestandards.org/the-standards/mathematics/high-school-geometry/expressing-geometric-properties-with-equations/)
- [Congruence](http://www.corestandards.org/the-standards/mathematics/high-school-geometry/congruence/)

### Linked Standards with Access Points:

- **MA.912.G.2.1**: Identify and describe convex, concave, regular, and irregular polygons.
- **MA.912.G.2.2**: Determine the measures of interior and exterior angles of polygons, justifying the method used.
- **MA.912.G.3.1**: Describe, classify, and compare relationships among quadrilaterals including the square, rectangle, rhombus, parallelogram, trapezoid, and kite.
- **MA.912.G.3.2**: Compare and contrast special quadrilaterals on the basis of their properties.
- **MA.912.G.3.3**: Use coordinate geometry to prove properties of congruent, regular, and similar quadrilaterals.
- **MA.912.G.3.4**: Prove theorems involving quadrilaterals.

### Essential Content & Understanding:

**A. Angle Measures in Polygons**

1. Investigate the interior and exterior angles of polygons.
2. Use the Polygon Interior Angle Theorem to find measures of interior angles of polygons.
3. Find the number of sides of a polygon
4. Use the Polygon Exterior Angles Theorem to find the measures of exterior angles of a polygon.
5. Apply the above theorems to regular polygons.

**B. Polygons**

1. Define convex and non-convex (concave)
2. Define regular polygons
3. Identify sides, angles, vertices, and diagonals
4. Use the interior angles of a quadrilateral theorem.

**C. Properties of Parallelograms**

1. Introduce the 5 essential characteristics of a parallelogram

**D. Proving Quadrilaterals are Parallelograms**

1. Learn the 6 ways to prove a quadrilateral is a parallelogram
2. Use properties of parallelograms in coordinate geometry

(continued on next page)

**E. Rhombuses, Rectangles, and Squares**

1. Distinguish between the 3 special parallelograms
2. Focus on the diagonals of special parallelograms.

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### Essential Questions:

How can you use coordinate geometry, diagonals, slope and distance formula to classify quadrilaterals?

### Resources/Links:

1) Resources for Prentice Hall Geometry Copyright 2011 Pearson Education (including remediation, extra practice, companion notes, enrichment, activities and projects):

[https://www.pearsonsuccessnet.com/snpapp/login/login.jsp](https://www.pearsonsuccessnet.com/snpapp/login/login.jsp)

2) Teaching/Learning Strategies:

a) Kagan Strategies:
   - Rally Robin
   - Sage and Scribe
   - Showdown for review before test
b) Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts
<table>
<thead>
<tr>
<th>F. Trapezoids and Kites</th>
<th>G. Polygons in the Coordinate Plane</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contrast and compare trapezoids, isosceles trapezoids and kites.</td>
<td>1. Classify polygons in the coordinate plane using distance, midpoint, and slope formulas.</td>
</tr>
<tr>
<td>2. Introduce the Mid-segment Theorem for trapezoids.</td>
<td>G. Polygons in the Coordinate Plane</td>
</tr>
</tbody>
</table>

Unit 6: Quadrilaterals

(Sections 6.2, 6.3, 6.4, 6.6, and 6.7)
## Unit 7: Transformations

### Sections 9.1, 9.2, and 9.3

### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

**MA.912.G.2.4:** Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons, to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons.

### Learning Goal:

Learn about transformations and apply them to the real-world.

### Objectives:

1. Students will recognize and describe three different types of transformations of geometric figures in the plane.
2. Students will manipulate real-world situations by applying transformations.

### Common Core:

[link to common core](http://www.corestandards.org/the-standards/mathematics/high-school-geometry/congruence/)

### Linked Standards with Access Points:

**MA.912.G.2.4:** Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons.

### Essential Content & Understanding:

<table>
<thead>
<tr>
<th>A. Reflections (flip)</th>
<th>B. Rotations (turn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduce terms: transformation, isometry, image, and pre-image.</td>
<td>1. Define center and angle of rotation.</td>
</tr>
<tr>
<td>2. Define line of reflection</td>
<td>2. Demonstrate rotation using protractor and straightedge.</td>
</tr>
<tr>
<td>3. Demonstrate reflection in the coordinate plane.</td>
<td>3. Describe and use rotational symmetry.</td>
</tr>
<tr>
<td>4. Find lines of symmetry.</td>
<td>C. Translations (slide or glide)</td>
</tr>
<tr>
<td></td>
<td>1. Use the coordinate plane to perform translations.</td>
</tr>
<tr>
<td></td>
<td>2. Introduce vectors</td>
</tr>
<tr>
<td></td>
<td>a) Describe initial and terminal points</td>
</tr>
</tbody>
</table>

### Essential Questions:

Where and how are transformations used in real-life?

### Resources/Links:

1. Resources for Prentice Hall Geometry

2. Teaching/Learning Strategies:
   a) Kagan Strategies:
      a) Rally Robin
      b) Sage and Scribe
      c) Showdown for review before test
   b) Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts

### EduSoft Mini-Assessment(s):

[www.edusoft.com](http://www.edusoft.com)

### Key Vocabulary:

angle of rotation, center of rotation, image, line of reflection, isometry, pre-image,
### 2012-2013 Instructional Curriculum Plan

#### Grade: 10th

#### Course: Geometry

#### Unit 8: Similarity

(Sections 7.1, 7.2, 7.3, 7.5 and 9.5)

**Instructional Focus Benchmarks**

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

- **MA.912.G.2.3:** Use properties of congruent and similar polygons to solve mathematical or real-world problems.
- **MA.912.G.2.4:** Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons.
- **MA.912.G.4.6:** Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.

**EduSoft Mini-Assessment(s):**

- [www.edusoft.com](http://www.edusoft.com)

**Date Range:** Given during the instruction per the outline in this section

**Key Vocabulary:**

means, extremes, geometric mean, dilation, enlargement, reduction,

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**Learning Goal:**

Students will learn how to prove triangles are similar and how to use similarity between triangles to find missing lengths.

**Objectives:**

1. Identify and apply properties of similar polygons.
2. Prove triangles are similar by recognizing given properties.
3. Find and apply relationships in similar right triangles including the geometric mean.

**Common Core:**


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**Linked Standards with Access Points:**

- **MA.912.G.2.3:** Use properties of congruent and similar polygons to solve mathematical or real-world problems.
- **MA.912.G.2.4:** Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons.
- **MA.912.G.4.5:** Apply theorems involving segments divided proportionally.
- **MA.912.G.4.6:** Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.

---

**Essential Content & Understanding:**

- **A. Ratio and Proportion**
  1. Review ratio, including simplifying ratios and writing extended ratios.
  2. Use proportions
     a) Means-Extremes property.
     b) Reciprocal property
     c) Solve proportions
  3. Introduce and apply the Geometric Mean
  4. Visit real-world application of proportions
- **B. Similar Polygons**
  1. Define similar polygons
  2. Introduce symbol of similarity (~)
  3. Write a Similarity Statement
  4. Compare similar polygons with shrinking and enlargement, such as on a copy machine.
- **C. Proving Triangles are Similar**
  1. Write a proportionality statement comparing two similar triangles.
  2. Use the AA ~ Postulate, SSS ~ Theorem, and SAS ~ Theorem to prove two triangles are similar.
  3. Use scale factors
  4. Use similar triangles to measure distances indirectly.

(continued on next page)

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**Essential Questions:**

How would you use similarity in construction, drafting or other real-world situations?

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**Resources/Links:**

1) Resources for Prentice Hall *Geometry*
   Copyright 2011 Pearson Education (including remediation, extra practice, companion notes, enrichment, activities and projects):
   [https://www.pearsonsuccessnet.com/snpapp/login/login.jsp](https://www.pearsonsuccessnet.com/snpapp/login/login.jsp)
2) Teaching/Learning Strategies:
   a) Kagan Strategies:
      a) Rally Robin
      b) Sage and Scribe
      c) Showdown for review before test
   b) Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts
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<th>Time Allowed:</th>
<th>5 days (Block) 10 days</th>
</tr>
</thead>
</table>

### 2012-2013 Instructional Curriculum Plan

**Grade: 10th**

**Course: Geometry**

**Unit 8: Similarity**

(Sections 7.1, 7.2, 7.3, 7.5 and 9.5)

| 3. Make real-world applications of similar triangles to work such as construction. |
| E. Identify and apply Dilations |

---

3. Make real-world applications of similar triangles to work such as construction.  
E. Identify and apply Dilations
# 2012-2013 Instructional Curriculum Plan

## Grade: 10th

### Course: Geometry

#### Unit 9: Right Triangles and Trigonometry

(Sections 7.4, 8.1, 8.2 and 8.3)

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**Instructional Focus Benchmarks**

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

- **MA.912.G.5.4**: Solve real-world problems involving right triangles.
- **MA.912.T.2.1**: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.

**EduSoft Mini-Assessment(s):**

[www.edusoft.com](http://www.edusoft.com)

**Date Range:** Given during the instruction per the outline in this section

**Key Vocabulary:**

- geometric mean, Pythagorean triple, trigonometric ratios, sine, cosine, tangent

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**Learning Goal:**

Explore concepts related to right triangles, including special conditions and trigonometric functions.

**Objectives:**

1. Determine the geometric mean between two numbers.
2. State and apply the Pythagorean Theorem and its converse.
3. Determine the length of the of the remaining sides of a 45-45-90 and 30-60-90 triangle given one side.
4. Define the sine, cosine and tangent ratios for acute angles.
5. Solve problems involving right triangles by using sine, cosine, or tangent.

---

**Essential Content & Understanding:**

**A. Geometric Mean**

1. Define: geometric mean and simplest radical form.
2. Determine the geometric mean between two numbers.
3. State and apply the relationships that exist when an altitude is drawn to the hypotenuse of a right triangle.

**B. Pythagorean Theorem**

1. State and apply the Pythagorean Theorem.

**C. Converse of the Pythagorean Theorem**

1. State and apply the Converse of the Pythagorean Theorem and the related theorems about obtuse and acute triangles.

**D. Special Right Triangles**

1. Determine the lengths of two sides of a 45-45-90 or 30-60-90 triangle given the third side.
2. Define tangent, sine, and cosine ratios for an acute angle.
3. Solve right triangle problems by correct selection and use of the sine, cosine, and tangent ratios.

---

**Essential Questions:**

1. How are the relationships in special right triangles useful in solving problems?
2. How do you use trigonometric ratios to solve problems with right triangles?

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**Resources/Links:**

1. **Resources for Prentice Hall Geometry**
   
   Copyright 2011 Pearson Education (including remediation, extra practice, companion notes, enrichment, activities and projects):
   [https://www.pearsonsuccessnet.com/snpapp/login/login.jsp](https://www.pearsonsuccessnet.com/snpapp/login/login.jsp)

2. **Teaching/Learning Strategies:**
   
   a) Kagan Strategies:
   
   b) Sage and Scribe
   
   c) Mix’ N’ Match game (template in Kagan Geometry resources)
   
   d) Showdown for review before test
   
   b) Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts
# 2012-2013 Instructional Curriculum Plan

## Grade: 10th Course: Geometry

### Unit 10: Circles

*(Sections 12.1, 12.2, 12.3, 12.4, and 12.5)*

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### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

**MA.912.G.6.6:** Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle.

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### Learning Goal:

Apply theorems learned in previous chapters to segments touching circles.

### Objectives:

1. Utilize arcs, angles, and segments in circles to solve real-world problems.

### Essential Content & Understanding:

**A. Tangents to Circles**

1. Define: circle, diameter, radius, chord, secant, and tangent.
2. Contrast tangent lines and tangent circle by defining: point of tangency; common internal and external tangents and concentric circles.

**B. Arcs and Chords**

1. Define: central angle, minor and major arc, and semicircle.
2. Find the degree measure of all types of arcs.
3. Use chords of circles to locate the center of a circle.
4. Know and apply the properties and theorems of chords.

**C. Inscribed Angles and Other Angle Relationships**

1. Define: intercepted arc and measure of an inscribed angle.
2. Inscribe a polygon in a circle
3. Use tangents and chords to find the measure of arcs and angles of circles.

**D. Segment Lengths in Circles**

1. Define: segments of a chord; tangent segment; secant and external segment.
2. Find segment lengths.

**E. Equation of a Circle**

1. Write the equation of a circle in center-radius form.

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### Essential Questions:

When lines intersect a circle, or within a circle, how do you find the resulting measures of resulting angles, arcs, and segments?

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### Resources/Links:

1. Resources for Prentice Hall Geometry

2. Teaching/Learning Strategies:
   a) Kagan Strategies:
      a) Rally Robin
      b) Sage and Scribe
   b) Showdown for review before test
   c) Learning log or exit cards (or post-its) for students to summarize daily/weekly concept

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### EduSoft Mini-Assessment(s):

[www.edusoft.com](http://www.edusoft.com)

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### Date Range: Given during the instruction per the outline in this section

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### Key Vocabulary:

- chord, secant, tangent, inscribed angle, intercepted arc, point of tangency, equation of a circle in center-radius form, concentric circles, central angle, minor arcs, major arcs, inscribed
## 2012-2013 Instructional Curriculum Plan

**Grade: 10th**

**Course: Geometry**

**Unit 11: Areas of Polygons and Circles**

(Sections 6.1, 10.1, 10.2, 10.3, 10.4, 10.6, and 10.7)

### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

- **MA.912.G.2.5**: Determine how changes in dimensions affect the perimeter and area of common geometric figures.

### Learning Goal:

Utilize area formulas for polygons and circle, perimeter formula for polygons and circumference formula for circles to solve problems.

#### Objectives:

1. Find areas of triangles and quadrilaterals by identifying the appropriate formula.
2. Compare perimeters and areas of similar figures using scale factor and ratio.
3. Calculate circumference and area of circles.
4. Analyze the arc length of a circle and area of a sector of a circle using angle measure and circumference and area formulas.

#### Common Core:


### Linked Standards with Access Points:

- **MA.912.G.6.2**: Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles.
- **MA.912.G.6.4**: Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents).
- **MA.912.G.4.4**: Use properties of congruent and similar triangles to solve problems involving lengths and areas.
- **MA.912.G.2.7**: Determine how changes in dimensions affect the perimeter and area of common geometric figures.

### Essential Content & Understanding:

#### A. Areas of Triangles and Quadrilaterals

1. Review the area formulas for rectangle, parallelogram, triangle and trapezoid.
2. Introduce the formulas for areas of kites and rhombuses.

#### B. Areas of Regular Polygons

1. Introduce the formula for the area of an equilateral triangle.
2. Define: center, radius, apothem, and central angle of a regular polygon.
3. Know and use the formula for area of a regular polygon (\(A = \frac{1}{2} aP\)).

#### C. Perimeters and Areas of Similar Figures

1. Review perimeter and area of polygons.
2. Introduce the Area of Similar Polygons Theorem
   - a) Emphasize the relationships between the scale factor and the ratio of the perimeters of the similar polygons.
   - b) Emphasize the relationships between the scale factor and the ratio of the areas of the similar polygons.
3. Review circumference of a circle and use circumference to explain arc length in contrast to “arc measure.”
4. Review area of circles and introduce area of sectors.

### Essential Questions:

- Explain the relationship between scale factor, perimeter and area of similar polygons.

### Resources/Links:

1. **Resources for Prentice Hall Geometry**
2. **Teaching/Learning Strategies**:
   - a) Kagan Strategies:
     - Rally Robin
   - b) Sage and Scribe
   - c) Showdown for review before test
   - b) Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts
# 2012-2013 Instructional Curriculum Plan

## Grade: 10th

**Course: Geometry**

**Unit 12: Surface Area and Volume**

(Sections 11.2, 11.3, 11.4, 11.5, 11.6, and 11.7)

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### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

- **MA.912.G.7.1**: Describe and make regular, non-regular, and oblique polyhedron, and sketch the net for a given polyhedron and vice versa.
- **MA.912.G.7.5**: Explain and use formulas for lateral area, surface area, and volume of solids.
- **MA.912.G.7.7**: Determine how changes in dimensions affect the surface area and volume of common geometric solids.

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### EduSoft Mini-Assessment(s):

- [www.edusoft.com](http://www.edusoft.com)

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### Date Range: Given during the instruction per the outline in this section

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### Key Vocabulary:

- base, cross-section, hemisphere, lateral area, lateral faces,

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### Learning Goal:

Find surface area and volume of three-dimensional figures.

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### Objectives:

1. Calculate the surface area and volume of various solids; then apply those techniques to real-world problems.

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### Common Core:

[link to common core](http://www.corestandards.org/the-standards/mathematics/high-school-geometry/geometric-measurement-and-dimension/)

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### Linked Standards with Access Points:

- **MA.912.G.7.2**: Determine how changes in dimensions affect the perimeter and area of common geometric figures.
- **MA.912.G.7.6**: Identify and use properties of congruent and similar solids.
- **MA.912.G.7.7**: Determine how changes in dimensions affect the surface area and volume of common geometric solids.

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### Essential Content & Understanding:

A. **Surface Area of:** prisms, cylinders, pyramids, cones, and spheres
   1. **Define:** prism, base of a prism, lateral face, right prism, oblique prism.
   2. Distinguish between lateral area and surface area of a prism.
   3. **Define:** cylinder, right cylinder.
   4. Distinguish between lateral area and surface area of a cylinder.
   5. **Define:** pyramid, regular pyramid, slant height.
   6. Distinguish between lateral area and surface area of a pyramid.

B. **Volume of:** Prisms, Cylinders, Pyramids, Cones, and Spheres
   1. **Define:** volume of a solid.
   2. Use the formulas for volume of the solids.
   3. Introduce Cavalieri’s Principle; the Volume Congruence Postulate and the Volume Addition Postulate.
   4. **Define:** volume of a solid.
   5. Use the formulas for volume of the solids.

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### Essential Questions:

What is the relationship between volume of prisms and pyramids, and/or cylinders and cones?

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### Resources/Links:

1. **Resources for Prentice Hall Geometry**
   Copyright 2011 Pearson Education (including remediation, extra practice, companion notes, enrichment, activities and projects):
   [https://www.pearsonsuccessnet.com/snpapp/login/login.jsp](https://www.pearsonsuccessnet.com/snpapp/login/login.jsp)

2. **Teaching/Learning Strategies:**
   a) **Kagan Strategies:**
      a) Rally Robin
      b) Sage and Scribe
   b) **Showdown for review before test**
   c) **Learning log or exit cards (or post Its) for students to summarize daily/weekly concepts**
2012-2013 Instructional Curriculum Plan  
Grade: 10th  
Course: Geometry

Unit 13: Angle of Elevation and Constructions  
(Sections 1.6, 8.4, and 3.6)

Instructor Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

MA.912.G.5.4: Solve real-world problems involving right triangles.

MA.912.T.2.1: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, co-secant) in terms of angles of right triangles.

EduSoft Mini-Assessment(s):
www.edusoft.com

Date Range: Given during the instruction per the outline in this section

Key Vocabulary:
angle of depression, angle of elevation, straightedge, compass, construction,

Learning Goal:
Review for EOC  
Use right triangle trigonometry to solve problems of elevation and depression.  
Learn basic geometric constructions.

Objectives:
1. Apply the trigonometry ratios to right triangles to solve real-world challenges.
2. Basic Construction

Common Core: (link to common core)
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/congruence/
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/similarity-right-triangles-and-trigonometry/

Linked Standards with Access Points:
MA.912.G.1.2: Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straightedge and compass or a drawing program, explaining and justifying the process used.

MA.912.G.4.1: Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.

MA.912.G.5.4: Solve real-world problems involving right triangles.

MA.912.T.2.1: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, co-secant) in terms of angles of right triangles.

Essential Content & Understanding:
A. Angles of Elevation and Depression  
1. Define and apply angle of elevation and angle of depression.
   2. Apply right triangle trigonometry to real-world situations such as height of a cliff, tower, or airplane.

B. Construction  
1. Define and use tools of construction  
2. Basic Constructions  
3. Construction of parallel and perpendicular lines

Essential Questions:
How do constructions help you to understand the principles of geometry?
How can you represent a three-dimensional shape in two dimensions?

Resources/Links:
1. Resources for Prentice Hall Geometry  
Copyright 2011 Pearson Education (including remediation, extra practice, companion notes, enrichment, activities, and projects):  
https://www.pearsonsuccessnet.com/snpapp/login/login.jsp

2. Teaching/Learning Strategies:
   a) Kagan Strategies:  
      a) Rally Robin  
      b) Sage and Scribe  
   b) Learning log or exit cards (or post-its) for students to summarize daily/weekly concepts