FLOYD COUNTY SCHOOLS' CURRICULUM RESOURCES

"Building a Better Future for Every Child - Every Day!"

Summer 2011

Subject Content: Geometry Grade : Sophomores

Indicates the Curriculum Map

THESE CONCEPTS WILL NO LONGER BE TAUGHT IN GEOMETRY. THEY HAVE BEEN MOVED TO THE INDICATED GRADE BELOW.	
KY.9-12.G.SC.3 Shapes and Relationships: Students will analyze and apply angle relationships (e.g., linear pairs, vertical, complementary, supplementary, corresponding and alternate interior angles) in real-world or mathematical situations	8
KY.9-12.M.SC.7 Measuring Physical Attributes: Students will apply special right triangles and the converse of the Pythagorean theorem to solve realistic problems	8
KY.9-12.G.SC.18 Coordinate Geometry: Students will find the distance between two points using their coordinates and the Pythagorean theorem or the distance formula	8
KY.9-12.M.SC.3 Measuring Physical Attributes: Students will determine the surface area and volume of right rectangular prisms, pyramids, cylinders, cones and spheres in realistic problems	8
KY.9-12.D.SC.32 Probability: Students will compute the probability of a compound event	7
KY.9-12.G.SC.1 Shapes and Relationships: Students will identify and apply the definitions, properties and theorems about line segments, rays and angles and use them to prove theorems in Euclidean geometry, solve problems and perform basic geometric constructions using a straight edge and a compass	7
KY.9-12.G.SC.11 Shapes and Relationships: Students will draw and construct representations of two-dimensional figures and three-dimensional objects using a variety of tools	7
KY.9-12.G.SC.8 Shapes and Relationships: Students will describe the intersection of lines, planes and solids and visualize three-dimensional objects and spaces from different perspectives and analyze their cross sections	7
KY.9-12.G.SC.3 Shapes and Relationships: Students will analyze and apply angle relationships (e.g., linear pairs, vertical, complementary, supplementary, corresponding and alternate interior angles) in real-world or mathematical situations	7
KY.8.M.SC.7 Measuring Physical Attributes: Students will develop and apply formulas for volume and surface area of cubes, cylinders and right rectangular prisms; investigate relationships between and among them	7
KY.9-12.G.SC.10 Shapes and Relationships: Students will visualize solids and surfaces in three-dimensional space when given two-dimensional representations and create two-dimensional representations for the surfaces of three-dimensional objects	6
KY.9-12.M.SC.3 Measuring Physical Attributes: Students will determine the surface area and volume of right rectangular prisms, pyramids, cylinders, cones and spheres in realistic problems	6
KY.9-12.G.SC.18 Coordinate Geometry: Students will find the distance between two points using their coordinates and the Pythagorean theorem or the distance formula	6

1-3 Weeks	4-6 Weeks	7-9 Weeks
*Foundations of Geometry (11) Coordinate Geometry (6)	Beyond Logic and Proof (10)	Angle Relationships (10)
10-12 Weeks	**13-15 Weeks**	**16-18 Weeks**
Triangles (segments, angles, sides) (8) *Congruent Triangles (7)	Angles of Polygons and Quadrilaterals (10)	Area, Perimeter, and Geometric Probability (10)
19-21 Weeks	**22-24 Weeks**	**25-27 Weeks**
Lateral Area, Surface Area, and Volume (8)	Similarity (10)	Right Triangles (5) Trigonometry (6)
28-30 Weeks	**31-33 Weeks**	**34-36 Weeks**
Circles (9) *Constructions (8)	Transformations in Space and on the coordinate plane (6)	Review/ EOC Testing

Weeks 1 – 3

*Foundations of Geometry (11)

Coordinate Geometry (6)

Curriculum

ACT Quality Core

I can…

C. Using Logic and Proof to Reason Mathematically

1. Logic and Proof

a. Use definitions, basic postulates, and theorems about points, segments, lines, angles, and planes to write proofs and solve problems

b. Use inductive reasoning to make conjectures and deductive reasoning to arrive at valid conclusions.

*d. Use various methods to prove that two lines are parallel or perpendicular(e.g. using coordinates, angles measures)

D. Identifying, Classifying, and Applying the Properties of Geometric Figures in Space

1. Points, Lines, Planes, and Space

a. Identify and model plane figures, including collinear and non collinear points, lines, segments, rays, and angles using appropriate mathematical symbols.

b. Identify vertical, adjacent, complimentary, and supplementary angle pairs and use them to solve problems. (e.g. solve equations, use in proofs)

2. Polygons

*d. Solve problems involving the relationships formed when the altitude to the hypotenuse of a right triangles is drawn

*G. Relating Geometric Ideas to the Coordinate Plane

1. Coordinate Geometry

a. Use slope to distinguish between and write equations for parallel and perpendicular lines.

b. Apply the midpoint and distance formulas to points and segments to find midpoints, distance, and missing information.

c. Use coordinate geometry to solve problems about geometric figures (e.g. segments, triangles, quadrilaterals)

Common Core Standards

*G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment based on the undefined notions of a point, line, distance along a line and distance around a circular arc.

*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.GPE.4 Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, $\sqrt{3}$) lies on the circle centered at the origin and containing the point (0, 2).

G.GPE.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

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 area of triangles and rectangles, e.g., using the distance formula.*(*Modeling Standard)

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).*(*Modeling Standard)

G.MG.2 Apply concepts of density based on area and volume in modeling situations (e.g. persons per square mile, BTU, per cubic ft)*

G.MG.3 Apply geometric methods to solve design problems(e.g. designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios)*

Gaps to be Addressed:

Completion 2013	*KY.9-12.G.SC.18 Coordinate Geometry: Students will find the distance between two points using their coordinates and the Pythagorean theorem or the distance formula*

Learning Targets from KDE Deconstructed Standards I can…				
	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.CO.1	• Describe the undefined terms: point, line, and distance along a line in a plane. • Define perpendicular lines, parallel lines, line segments, and angles. • Define circle and the distance around a circular arc.			
G.CO.9	• Identify and use properties of; • Vertical angles • Parallel lines with transversals • All angle relationships • Corresponding angles Alternate interior angles • Perpendicular bisector • Equidistant from endpoint	• Prove vertical angles are congruent. • Prove corresponding angles are congruent when two parallel lines are cut by a transversal and converse. • Prove alternate interior angles are congruent when two parallel lines are cut by a transversal and converse. • Prove points are on a perpendicular bisector of a line segment are exactly equidistant from the segments endpoint.		
G.GPE.4	• Recall previous understandings of coordinate geometry (including, but not limited to: distance, midpoint and slope formula, equation of a line, definitions of parallel and perpendicular lines, etc.) • From Appendix A: This unit has a close connection with the next unit. For example, a curriculum might merge G.GPE.1 and the unit 5 treatment of G.GPE.4 with the standards in this unit. Reasoning with triangles in this unit is limited to right triangles;	• Use coordinates to prove simple geometric theorems algebraically. • For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, $\sqrt{3}$) lies on the circle centered at the origin and containing the point (0, 2). • e.g., derive the equation of a line through 2 points using similar right triangles.		
G.GPE.5	• Recognize that slopes of parallel lines are equal. • Recognize that slopes of perpendicular lines are opposite reciprocals (i.e, the slopes of perpendicular lines have a product of -1) Find the equation of a line parallel to a given line that passes through a given point. • Find the equation of a line perpendicular to a given line that passes through a given point.	• Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems. • From Appendix A: Relate work on parallel lines in G.GPE.5 to work on A.REI.5 in High School Algebra 1 involving systems of equations having no solution or infinitely many solutions.		
G.GPE.6	• Recall the definition of ratio. • Recall previous understandings of coordinate geometry.	• Given a line segment (including those with positive and negative slopes) and a ratio, find the point on the segment that partitions the segment into the given ratio.		
G.GPE.7	• Use the coordinates of the vertices of a polygon to find the necessary dimensions for finding the perimeter (i.e., the distance between vertices). • Use the coordinates of the vertices of a triangle to find the necessary dimensions (base, height) for finding the area (i.e., the distance between vertices by counting, distance formula, Pythagorean Theorem, etc.). • Use the coordinates of the vertices of a rectangle to find the necessary dimensions (base, height) for finding the area (i.e., the distance between vertices by counting, distance formula).	• Formulate a model of figures in contextual problems to compute area and/or perimeter. • From Appendix A: G.GPE.7 provides practice with the distance formula and its connection with the Pythagorean Theorem.		

G.MG.1	• Use measures and properties of geometric shapes to describe real world objects	• Given a real world object, classify the object as a known geometric shape - use this to solve problems in context. • From Appendix A: Focus on situations in which the analysis of circles is required.		
G.MG.2	• Define density.	• Apply concepts of density based on area and volume to model real-life situations (e.g., persons per square mile, BTUs per cubic foot).		
G.MG.3	• Describe a typographical grid system.	• Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). • From Appendix A: Focus on situations well modeled by trigonometric ratios for acute angles.		

Critical Vocabulary

Foundations of Geometry	• Angle • Circle • perpendicular line • parallel line • line segment	• transversal line • collinear • non-collinear points • Ray	• points • segments • lines • plane	• Alternate interior angles • Alternate exterior angles • Perpendicular bisector • Distance around circular arc.	• Vertical angles • Complimentary angles • Adjacent angles • Supplementary angles
Coordinate Geometry	• Distance • Midpoint • Slope • Equation of a line	• Theorems • vertices • Pythagorean Theorem		• Perimeter • Polygon • Ratio	

Strategies/Activities

• TI-NSPIRE • Whiteboards • Geometric Solids • Game: Points around the room Angle Legs
• Magnetics

Balanced Assessment:

Formative	Summative
Exit Slips, Journals, Gallery Walks, Self-evaluation Stop Light, Random Questioning, bell ringers	Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)

Resources Needed

Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry TI-NSPIRE Activities	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 4-6

Beyond Logic and Proof (10)

ACT Quality Core	Common Core Standards
C. Using Logic and Proof to reason mathematically 1. Logic and Proof a. Use definitions, basic postulates, and theorems about points, segments, lines, angles, and planes to write proofs and solve problems b. Use inductive reasoning to make conjectures and deductive reasoning to arrive at valid conclusions. c. Identify and write conditional and bi-conditional statements along with the converse, inverse, and contra positive of a conditional statement; Use these statements to form conclusions. a. Read and write different types and formats of proofs including two column, flow chart, power graph, and indirect proofs.	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, SSS) follow from the definition of congruence in terms of rigid motions. 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.* 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. G.GPE.4 Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √**3) lies on the circle centered at the origin and conta**ining the point (0, 2). G.GPE.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point). G.GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

Learning Targets from KDE Deconstructed Standards I can…				
	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.CO.6				
G.CO.7	• Identify corresponding angles and sides of two triangles. • Identify corresponding pairs of angles and sides of congruent triangles after rigid motions.	• Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if corresponding pairs of sides and corresponding pairs of angles are congruent. • Use the definition of congruence in terms of rigid motions to show that if the corresponding pairs of sides and corresponding pairs of angles of two triangles are congruent then the two triangles are congruent. • Justify congruency of two triangles using transformations. • From Appendix A: Rigid motions are at the foundation of the definition of congruence. Students reason from the basic properties of rigid motions (that they preserve distance and angle), which are assumed without proof. Rigid motions and their assumed properties can be used to establish the usual triangle congruence criteria, which can then be used to prove other theorems.		
G.CO.8	• Informally use rigid motions to take angles to angles and segments to segments (from 8th grade). • Formally use dynamic geometry software or straightedge and compass to take angles to angles and segments to segments.	• Explain how the criteria for triangle congruence (ASA, SAS, SSS) follows from the definition of congruence in terms of rigid motions (i.e. if two angles and the included side of one triangle are transformed by the same rigid motion(s) then the triangle image will be congruent to the original triangle). • From Appendix A: Rigid motions are at the foundation of the definition of congruence. Students reason from the basic properties of rigid motions (that they preserve distance and angle), which are assumed without proof. Rigid motions and their assumed properties can be used to establish the usual triangle congruence criteria, which can then be used to prove other theorems.		

G.CO.9	Identify and use properties of; • Vertical angles • Parallel lines with transversals • All angle relationships • Corresponding angles • Alternate interior angles • Perpendicular bisector • Equidistant from endpoint	• Prove vertical angles are congruent. • Prove corresponding angles are congruent when two parallel lines are cut by a transversal and converse. • Prove alternate interior angles are congruent when two parallel lines are cut by a transversal and converse. • Prove points are on a perpendicular bisector of a line segment are exactly equidistant from the segments endpoint. • From Appendix A: Encourage multiple ways of writing proofs, such as in narrative paragraphs, using flow diagrams, in two-column format, and using diagrams without words. Students should be encouraged to focus on the validity of the underlying reasoning while exploring a variety of formats for expressing that reasoning.		
G.CO.10	• Identify the hypothesis and conclusion of a theorem.	• Design an argument to prove theorems about triangles. • Analyze components of the theorem. • Prove theorems about triangles. • From Appendix A: Encourage multiple ways of writing proofs, such as in narrative paragraphs, using flow diagrams, in two-column format, and using diagrams without words. Students should be encouraged to focus on the validity of the underlying reasoning while exploring a variety of formats for expressing that reasoning. Implementations of G.CO.10 may be extended to include concurrence of perpendicular bisectors and angle bisectors as preparation for G.C.3 in Unit 5.		
G.CO.11	• Classify types of quadrilaterals. • Explain theorems for parallelograms and relate to figure.	• Use the principle that corresponding parts of congruent triangles are congruent to solve problems. • Use properties of special quadrilaterals in a proof. • From Appendix A: Encourage multiple ways of writing proofs, such as in narrative paragraphs, using flow diagrams, in two-column format, and using diagrams without words. Students should be encouraged to focus on the validity of the underlying reasoning while exploring a variety of formats for expressing that reasoning.		
G	• Recall postulates, theorems, and definitions to prove theorems about triangles.	• Prove theorems involving similarity 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.)		
	• Recall congruence and similarity criteria for triangles.	• Use congruency and similarity theorems for triangles to solve problems. • Use congruency and similarity theorems for triangles to prove relationships in geometric figures.		
G.GPE.4	• Recall previous understandings of coordinate geometry (including, but not limited to: distance, midpoint and slope formula, equation of a line, definitions of parallel and perpendicular lines, etc.) • From Appendix A: This unit has a close connection with the next unit. For example, a curriculum might merge G.GPE.1 and the unit 5 treatment of G.GPE.4 with the standards in this unit. Reasoning with triangles in this unit is limited to right triangles;	• Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, $\sqrt{3}$) lies on the circle centered at the origin and containing the point (0, 2). • e.g., derive the equation of a line through 2 points using similar right triangles.		

G.GPE.5	• Recognize that slopes of parallel lines are equal. • Recognize that slopes of perpendicular lines are opposite reciprocals (i.e, the slopes of perpendicular lines have a product of -1) • Find the equation of a line parallel to a given line that passes through a given point. • Find the equation of a line perpendicular to a given line that passes through a given point.	• Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems. • From Appendix A: Relate work on parallel lines in G.GPE.5 to work on A.REI.5 in High School Algebra 1 involving systems of equations having no solution or infinitely many solutions.		
G.GPE.6	• Recall the definition of ratio. • Recall previous understandings of coordinate geometry.	• Given a line segment (including those with positive and negative slopes) and a ratio, find the point on the segment that partitions the segment into the given ratio.		

Critical Vocabulary

Beyond Logic and Proof	• Bi-conditional • Conclusion • Conditional • Conjecture • Contra-positive	• Converse • Deductive Reasoning • Hypothesis • Inductive Reasoning • Inverse	• Negation • Theorem • Counter example

Strategies/Activities

Balanced Assessment:

Formative	Summative
Exit Slips, Journals, Gallery Walks, Self-evaluation Stop Light, Random Questioning, bell ringers	Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)

Resources Needed

Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry Core Standards Coach Books	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 7-9

Angle Relationships (10)

ACT Quality Core

I can…

B. Exploring the Skills and Strategies Underlying Mathematics

1. Mathematical Processes Learned in the Context of Increasingly Complex Mathematical and Real-World Problems

- b. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems
- c. Use a variety of strategies to set up and solve increasingly complex problems
- d. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships
- e. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly.
- f. Make mathematical connections among concepts, across disciplines, and in everyday experiences decrease time spent on computations after a skill has been established)
- h. Apply previously learned algebraic and geometric concepts to more advances problems

C. Using Logic and Proof to reason mathematically

1. Logic and Proof

- a. Use definitions, basic postulates, and theorems about points, segments, lines, angles, and planes to write proofs and solve problems
- b. Use inductive reasoning to make conjectures and deductive reasoning to arrive at valid conclusions.
- d. Use various methods to prove that two lines are parallel or perpendicular(e.g. using coordinates, angle measures)
- e. Read and write different types and formats of proofs including two column, flow chart, power graph, and indirect proofs.

D. Identifying, Classifying, and Applying the properties of Geometric figures in space

1. Points, Lines, Planes, and Space

- b. Identify vertical, adjacent, complimentary, and supplementary angle pairs and use them to solve problems(e.g. solve equations, use in proofs)
- c. Identify corresponding, same-side interior, same-side exterior, alternate interior and alternate exterior, angle pairs formed by a pair of parallel lines and a transversal and use these special angle pairs to solve problems(e.g. solve equations, using proofs)
- f. Apply properties and theorems of parallel and perpendicular lines to solve problems.

G. Relating Geometric Ideas to the Coordinate Plane

1. Coordinate Geometry

- a. Use slope to distinguish between and write equations for parallel and perpendicular lines.

Common Core Standards

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; point in a perpendicular bisector of a line segment are exactly those equidistant from the segments endpoints.

Gaps to be Addressed:

Completion 2015	KY.9-12.G.SC.3 Shapes and Relationships: Students will analyze and apply angle relationships (e.g., linear pairs, vertical, complementary, supplementary, corresponding and alternate interior angles) in real-world or mathematical situations

Learning Targets from KDE Deconstructed Standards I can…				
	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.CO.9	Identify and use properties of: • Vertical angles • Parallel lines with transversals • All angle relationships • Corresponding angles • Alternate interior angles • Perpendicular bisector • Equidistant from endpoint	• Prove vertical angles are congruent. • Prove corresponding angles are congruent when two parallel lines are cut by a transversal and converse. • Prove alternate interior angles are congruent when two parallel lines are cut by a transversal and converse. • Prove points are on a perpendicular bisector of a line segment are exactly equidistant from the segments endpoint. • From Appendix A: Encourage multiple ways of writing proofs, such as in narrative paragraphs, using flow diagrams, in two-column format, and using diagrams without words. Students should be encouraged to focus on the validity of the underlying reasoning while exploring a variety of formats for expressing that reasoning.		

Critical Vocabulary			
Angle Relationships	• Alternate Exterior Angles • Alternate Interior Angles • Corresponding Angles	• Exterior Angle of a Polygon • Parallel lines • Same Side Interior	• Skew Lines • Transversal

Strategies/Activities

Balanced Assessment:	
Formative Exit Slips, Journals, Gallery Walks, Self-evaluation Stop Light, Random Questioning, bell ringers	Summative Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)

Resources Needed	
Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry Core Standards Coach Books	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 10-12

Triangles (segments, angles, sides) (8)
*Congruent Triangles (7)

ACT Quality Core	Common Core Standards
I can… B. 1. Mathematical Processes Learned in the Context of Increasingly Complex Mathematical and Real-World Problems A.Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems B. Use a variety of strategies to set up and solve increasingly complex problems. d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems f. Make mathematical connections among concepts, across disciplines, and in everyday experiences g. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships. decrease time spent on computations after a skill has been established) h. Apply previously learned algebraic and geometric concepts. * C. Using Logic and Proof to reason mathematically 1. Logic and Proof A. Use definitions, basic postulates, and theorems about points, segments, lines, angles, and planes to write proofs and solve problems b.Use inductive reasoning to make conjectures and deductive reasoning to arrive at valid conclusions. c. Identify and write conditional and bi conditional statements along with the converse, inverse, and contrapositive of a conditional statement; use these statements to form conclusions. d.Use various methods to prove that two lines are parallel or perpendicular(e.g. using coordinates, angle measures) e. Read and write different types and formats of proofs including two column, flow chart, power graph, and indirect proofs. f. Prove that two triangles are congruent by applying the SSS, SAS, ASA, AAS, HL congruence statements. g. Use the principle that corresponding parts of congruent triangles are congruent to solve problems. D. Identifying, Classifying, and Applying the Properties of Geometric Figures in Space. *1. Points, Lines, Planes and Space a. Identify and model plane figures, including collinear and non collinear points, lines, segments, rays, and angles, using appropriate and mathematical symbols. b. Identify vertical, adjacent, complimentary, and supplementary angle pairs and use them to solve problems(e.g. solve equations, use in proofs) c. Identify corresponding, same-side interior, same-side exterior, alternate interior and alternate exterior, angle pairs formed by a pair of parallel lines and a transversal and use these special angle pairs to solve problems(e.g. solve equations, using proofs) 2. Polygons a. Identify and classify triangles by their sides and angles. b. Identify medians, altitudes, perpendicular bisectors, and angles bisectors of triangles and use their properties to solve problems.(e.g. find points of concurrency, segment lengths, or angle measures) c. Apply the triangle inequality theorem to determine if a triangle exists and the order of sides and angles. i. Apply the Angle sum theorem for triangles and polygons to find interior and exterior angle measures given the number of sides, to find the number of sides given	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.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).*(*Modeling Standard) *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).* (*Modeling Standard) *G.MG.3 Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*(*Modeling Standard)

angle measures, and to solve real world problems. j. Apply the isosceles Triangle Theorem and its converse to triangles to solve mathematical and real world problems. E. Comparing Congruent and Similar Geometric Figures 1.Similarity and Congruence a. Determine points or lines of symmetry and apply the properties of symmetry to figures G. Relating Geometric Ideas to the Coordinate Plane 1. Coordinate Geometry b. Use coordinate geometry to solve problems about geometric figures(e.g. segments, triangles, quadrilaterals)	*G.CO.8 Explain how the criteria for triangle congruence (ASA, SAS, SSS) follow from the definition of congruence in terms of rigid motions.

Learning Targets from KDE Deconstructed Standards
I can…

	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.CO.10	• Identify the hypothesis and conclusion of a theorem.	• Design an argument to prove theorems about triangles. • Analyze components of the theorem. • Prove theorems about triangles. • From Appendix A: Encourage multiple ways of writing proofs, such as in narrative paragraphs, using flow diagrams, in two-column format, and using diagrams without words. Students should be encouraged to focus on the validity of the underlying reasoning while exploring a variety of formats for expressing that reasoning. Implementations of G.CO.10 may be extended to include concurrence of perpendicular bisectors and angle bisectors as preparation for G.C.3 in Unit 5.		
G.MG.1	• Use measures and properties of geometric shapes to describe real world objects	• Given a real world object, classify the object as a known geometric shape - use this to solve problems in context. • From Appendix A: Focus on situations in which the analysis of circles is required.		
G.MG.2	• Define density.	• Apply concepts of density based on area and volume to model real-life situations (e.g., persons per square mile, BTUs per cubic foot).		
G.MG.3	• Describe a typographical grid system.	• Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). • From Appendix A: Focus on situations well modeled by trigonometric ratios for acute angles.		

G.CO.8	• Informally use rigid motions to take angles to angles and segments to segments (from 8th grade). • Formally use dynamic geometry software or straightedge and compass to take angles to angles and segments to segments.	• Explain how the criteria for triangle congruence (ASA, SAS, SSS) follows from the definition of congruence in terms of rigid motions (i.e. if two angles and the included side of one triangle are transformed by the same rigid motion(s) then the triangle image will be congruent to the original triangle). From Appendix A: Rigid motions are at the foundation of the definition of congruence. Students reason from the basic properties of rigid motions (that they preserve distance and angle), which are assumed without proof. Rigid motions and their assumed properties can be used to establish the usual triangle congruence criteria, which can then be used to prove other theorems.		

Critical Vocabulary

Congruent triangles	• Base of isosceles triangle • Base angles of isosceles triangle • Congruent polygons • hypotenuse	• Legs of right triangle • Legs of right triangle • Legs of isosceles triangle • Vertex angle

Strategies/Activities

Balanced Assessment:

Formative	Summative
Exit Slips, Journals, Gallery Walks, Self-evaluation Stop Light, Random Questioning, bell ringers	Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)

Resources Needed

Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry Core Standards Coach Books	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 13-15

Angles of Polygons and Quadrilaterals (10)

ACT Quality Core	Common Core Standards
I can… B. 1. Mathematical Processes Learned in the Context of Increasingly Complex Mathematical and Real-World Problems a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems b. Use a variety of strategies to set up and solve increasingly complex problems c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems f. Make mathematical connections among concepts, across disciplines, and in everyday experiences g. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships, h. decrease time spent on computations after a skill has been established) i. h. Apply previously learned algebraic and geometric concepts to more advances problems C. Using Logic and Proof to reason mathematically 1. Logic and Proof A. Use definitions, basic postulates, and theorems about points, segments, lines, angles, and planes to write proofs and solve problems b. Use inductive reasoning to make conjectures and deductive reasoning to arrive at valid conclusions. c. Identify and write conditional and bi conditional statements along with the converse, inverse, and contrapositive of a conditional statement; use these statements to form conclusions. d. Use various methods to prove that two lines are parallel or perpendicular(e.g. using coordinates, angle measures) e. Read and write different types and formats of proofs including two column, flow chart, power graph, and indirect proofs. f. Prove that two triangles are congruent by applying the SSS, SAS, ASA, AAS, HL congruence statements. g. Use the principle that corresponding parts of congruent triangles are congruent to solve problems. i. Use properties of special quadrilaterals in a proof. D. Identifying, Classifying, and Applying the properties of Geometric figures in space 1. Points, Lines, Planes, and Space a. Identify and model plane figures, including collinear and non collinear points, lines, segments, rays, and angles, using appropriate and mathematical symbols. b. Identify vertical, adjacent, complimentary, and supplementary angle pairs and use them to solve problems(e.g. solve equations, use in proofs) c. Identify corresponding, same-side interior, same-side exterior, alternate interior and alternate exterior, angle pairs formed by a pair of parallel lines and a transversal and use these special angle pairs to solve problems(e.g. solve equations, using proofs) f. Apply properties and theorems of parallel and perpendicular lines to solve problems. 2. Polygons	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).*(*Modeling Standard) 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).* (*Modeling Standard) G.MG.3 Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*(*Modeling Standard)

g. Identify and classify quadrilaterals, including parallelograms, rectangles, rhombi, squares, kites, trapezoids, and isosceles trapezoids using their properties.
h. Identify and classify regular and non regular polygons(e.g. pentagons, hexagons, heptagons, octagons, nonagons, decagons, dodecagons) based on the number of sides, the angle measures, and the side lengths.
i. Apply the angle sum theorem for triangles and polygons to find interior and exterior angle measures given the number of sides, to find the number of sides given angle measures, and to solve real world problems.

E. Comparing Congruent and Similar Geometric Figures
1. Similarity and Congruence
a. Determine points or lines of symmetry and apply the properties of symmetry to figures.

G. Relating Geometric Ideas to the Coordinate Plane
1. Coordinate Geometry
a. Use slope to distinguish between and write equations for parallel and perpendicular lines.
b. Apply the midpoint and distance formulas to points and segments to find midpoints, distance, and missing information.
c. Use coordinate geometry to solve problems about geometric figures (e.g. segments, triangles, quadrilaterals)

Learning Targets from KDE Deconstructed Standards
I can...

	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.MG.1	• Use measures and properties of geometric shapes to describe real world objects	• Given a real world object, classify the object as a known geometric shape - use this to solve problems in context. • From Appendix A: Focus on situations in which the analysis of circles is required.		
G.MG.2	• Define density.	• Apply concepts of density based on area and volume to model real-life situations (e.g., persons per square mile, BTUs per cubic foot).		
G.MG.3	• Describe a typographical grid system.	• Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). • From Appendix A: Focus on situations well modeled by trigonometric ratios for acute angles.		

Critical Vocabulary

Angles on polygons and quadrilaterals	• Equiangular polygon • Equilateral polygon	• Parallelogram • Rectangle	• Rhombus • Trapezoid	• Kite • Midsegment of a trapezoid	• Regular polygon • Isosceles trapezoid

Strategies/Activities

Balanced Assessment:	
Formative Exit Slips, Journals, Gallery Walks, Self-evaluation Stop Light, Random Questioning, bell ringers	Summative Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)

Resources Needed	
Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry Core Standards Coach Books	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 16-18

Area, Perimeter, and Geometric Probability (10)

ACT Quality Core

I can…

B. 1. Mathematical Processes Learned in the Context of Increasingly Complex Mathematical and Real-World Problems

a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems
b. Use a variety of strategies to set up and solve increasingly complex problems
c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships
d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly
e. Make mathematical connections among concepts, across disciplines, and in everyday experiences

E. Comparing Congruent and Similar Geometric Figures

1. Similarity and Congruence

f. Apply relationships between perimeters of similar figures, areas of similar figures, and volumes of similar figures, in terms of scale factor, to solve mathematical and real world problems.

F. Using Length, Area, Perimeter, and Volume to find Quantities and Solve Problems.

1. Area and Perimeter

g. Find the perimeter and area of common plane figures, including triangles, quadrilaterals, regular polygons, and irregular figures from given information using appropriate units of measurement.
h. Manipulate perimeter and area formulas to solve problems(e.g. finding missing lengths)
i. Use areas to solve problems involving geometric probability
j. Find arc lengths and circumferences from given information(e.g. radius, diameter, coordinates)
k. Find the area of a circle and the area of a sector of a circle from given information(e.g. radius, diameter, coordinates)

Common Core Standards

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

Gaps to be Addressed:

Completion 2015	KY.9-12.D.SC.32 Probability: Students will compute the probability of a compound event

Learning Targets from KDE Deconstructed Standards

I can…

	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.GPE.7	• Use the coordinates of the vertices of a polygon to find the necessary dimensions for finding the perimeter (i.e., the distance between vertices). • Use the coordinates of the vertices of a triangle to find the necessary dimensions (base, height) for finding the area (i.e., the distance between vertices by counting, distance formula, Pythagorean Theorem, etc.). • Use the coordinates of the vertices of a rectangle to find the necessary dimensions (base, height) for finding the area (i.e., the distance between vertices by counting, distance formula).	• Formulate a model of figures in contextual problems to compute area and/or perimeter. • From Appendix A: G.GPE.7 provides practice with the distance formula and its connection with the Pythagorean theorem.		

Critical Vocabulary		
Area, perimeter Geo prob	• Altitude • Apothem • Base • circumference • Height • Irregular figure	• perimeter • Radius

Strategies/Activities

Balanced Assessment:	
Formative Exit Slips, Journals, Gallery Walks, Self-evaluation Stop Light, Random Questioning, bell ringers	Summative Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)

Resources Needed	
Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry Core Standards Coach Books	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 19-21

Lateral Area, Surface Area, and Volume (8)

ACT Quality Core

I can…

B. 1. Mathematical Processes Learned in the Context of Increasingly Complex Mathematical and Real-World Problems

a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems

c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships

d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly

f. Make mathematical connections among concepts, across disciplines, and in everyday experiences

g. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships,

h. decrease time spent on computations after a skill has been established)

i. Apply previously learned algebraic and geometric concepts to more advances problems

D. Identifying, Classifying, and Applying the properties of geometric figures in Space.

4. Solids

a. Identify and classify prisms, pyramids, cylinders, cones, and spheres, and use their properties to solve problems

b. Describe and draw cross sections of prisms, cylinders, pyramids, and cones.

E. Comparing Congruent and Similar Geometric Figures

1. Similarity and Congruence

f. Apply relationships between perimeters of similar figures, areas of similar figures, and volumes of similar figures in terms of scale factor, to solve mathematical and real world problems.

F. Using length, Area, Perimeter, and Volume to find quantities and solve problems.

2. Lateral Area, Surface Area, and Volume

a. Find the lateral area, surface area, and volume of prisms, cylinders, cones, and pyramids in mathematical and real world settings.

b. Use cross sections of prisms, cylinders, pyramids, and cones to solve volume problems.

c. Find the surface area and volume of a sphere in mathematical and real world settings.

Common Core Standards

G.GMD.1 Give an informal argument for the formulas for the circumference of a circle, volume of a cylinder, pyramid, and cone. Use dissection argument, Cavalieri's principle, and informal limit arguments.

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

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.

Gaps to be addressed:

Completion 2016	*KY.9-12.G.SC.10 Shapes and Relationships: Students will visualize solids and surfaces in three-dimensional space when given two-dimensional representations and create two-dimensional representations for the surfaces of three-dimensional objects*
Completion 2016	*KY.9-12.M.SC.3 Measuring Physical Attributes: Students will determine the surface area and volume of right rectangular prisms, pyramids, cylinders, cones and spheres in realistic problems*
Completion 2015	*KY.9-12.G.SC.8 Shapes and Relationships: Students will describe the intersection of lines, planes and solids and visualize three-dimensional objects and spaces from different perspectives and analyze their cross sections*

Learning Targets from KDE Deconstructed Standards I can…				
	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.GMD.1				
G.GMD.3	• Utilize the appropriate formula for volume depending on the figure.	• Use volume formulas for cylinders, pyramids, cones, and spheres to solve contextual problems. • From Appendix A: Informal arguments for area and volume formulas can make use of the way in which area and volume scale under similarity transformations: when one figure in the plane results from another by applying a similarity transformation with scale factor K, its area is K2 times the area of the first. Similarly, volumes of solid figures scale by K3 under a similarity transformations with scale factor K.		
G.GMD.4	• Use strategies to help visualize relationships between two-dimensional and three dimensional objects	• Relate the shapes of two-dimensional cross-sections to their three-dimensional objects • Discover three-dimensional objects generated by rotations of two-dimensional objects.		
Critical Vocabulary				
Surface area and volume	• Cone • Cross section • Cylinder	• Pyramid • surface • prism	• Polyhedron • Face	

Strategies/Activities

Balanced Assessment:	
Formative Exit Slips, Journals, Gallery Walks, Self-evaluation Stop Light, Random Questioning, bell ringers	Summative Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)

Resources Needed	
Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry Core Standards Coach Books	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 22-24

Similarity (10)

ACT Quality Core	Common Core Standards
I can… B. 1. Mathematical Processes Learned in the Context of Increasingly Complex Mathematical and Real-World Problems a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems b. Use a variety of strategies to set up and solve increasingly complex problems c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly f. Make mathematical connections among concepts, across disciplines, and in everyday experiences C. Using Logic and Proof to reason mathematically 1. Logic and Proof a. Use definitions, basic postulates, and theorems about points, segments, lines, angles, and planes to write proofs and solve problems b. Use inductive reasoning to make conjectures and deductive reasoning to arrive at valid conclusions. e. Read and write different types and formats of proofs including two column, flow chart, power graph, and indirect proofs. h. Use several methods, including AA, SAS, and SSS, to prove that two triangles are similar, corresponding sides are proportional, and corresponding angles are congruent. E. Comparing Congruent and Similar Geometric Figures 1. Similarity and Congruence c. Identify similar figures and use ratios and proportions to solve mathematical and real world problems(e.g. finding the height of a tree using the shadow of the tree, and the height and shadow of a person) d. Use the definition of similarity to establish the congruence of angles, proportionality of sides, and scale factor of two similar polygons) f. Apply relationships between perimeters of similar figures, areas of similar figures, and volumes of similar figures, in terms of scale factor, to solve mathematical and real world problems. h. Identify and give properties of congruent and similar solids.	G.SRT.1a 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. G.SRT.1b Verify experimentally the properties of dilations given by a center and a scale factor. 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 AA criterion for two triangles to be similar. 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.

Learning Targets from KDE Deconstructed Standards I can…				
	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.SRT.1A	• Define image, pre-image, scale factor, center, and similar figures as they relate to transformations. • Identify a dilation stating its scale factor and center	• Verify experimentally that a dilated image is similar to its pre-image by showing congruent corresponding angles and proportional sides. • Verify experimentally that a dilation takes a line not passing through the center of the dilation to a parallel line by showing the lines are parallel. • Verify experimentally that dilation leaves a line passing through the center of the dilation unchanged by showing that it is the same line.		
G.SRT.1B	• Define image, pre-image, scale factor, center, and similar figures as they relate to transformations. • Identify a dilation stating its scale factor and center • Explain that the scale factor represents how many times longer or shorter a dilated line segment is than its pre-image.	• Verify experimentally that the dilation of a line segment is longer or shorter in the ratio given by the scale factor.		
G.SRT.2	• By using similarity transformations, explain that triangles are similar if all pairs of corresponding angles are congruent and all corresponding pairs of sides are proportional.	• Given two figures, decide if they are similar by using the definition of similarity in terms of similarity transformations.		
G.SRT.3	• Recall the properties of similarity transformations.	• Establish the AA criterion for similarity of triangles by extending the properties of similarity transformations to the general case of any two similar triangles.		
G.SRT.4	• Recall postulates, theorems, and definitions to prove theorems about triangles.	• Prove theorems involving similarity 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	• Recall congruence and similarity criteria for triangles.	• Use congruency and similarity theorems for triangles to solve problems. • Use congruency and similarity theorems for triangles to prove relationships in geometric figures.		
Critical Vocabulary				
Similarity	• Extremes • Proportion • Geometric mean • Means of a proportion • Proportion • Similar figures • Similar polygons • Ratio • Scale factor • Scale drawing • Indirect measurement			

Strategies/Activities

Balanced Assessment:	
Formative Exit Slips, Journals, Gallery Walks, Self-evaluation Stop Light, Random Questioning, bell ringers	Summative Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)

Resources Needed	
Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry Core Standards Coach Books	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 25-27

Right Triangles (5)
Trigonometry (6)

ACT Quality Core	Common Core Standards
I can… B. 1. Mathematical Processes Learned in the Context of Increasingly Complex Mathematical and Real-World Problems a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems b. Use a variety of strategies to set up and solve increasingly complex problems c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems f. Make mathematical connections among concepts, across disciplines, and in everyday experiences g. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships,decrease time spent on computations after a skill has been established) h. Apply previously learned algebraic and geometric concepts to more advances problems to more advanced problems C. Using Logic and Proof to reason mathematically 1. Logic and Proof a. Use definitions, basic postulates, and theorems about points, segments, lines, angles, and planes to write proofs and solve problems. d. Use various methods to prove that two lines are parallel or perpendicular (e.g. Using coordinates, angles measures) h. Use several methods including AA, SAS, SSS, to prove that two triangles are similar, corresponding sides are proportional, and corresponding angles are congruent. D. Identifying, Classifying, and Applying the properties of Geometric figures in Space. 1. Points, lines, planes, and space a. Identify and model plane figures including collinear and non collinear points, lines, and segments, rays, and angles, using appropriate mathematical symbols. 2. Polygons a. identify and classify triangles by their sides and angles. b. Identify medians, altitudes, perpendicular bisectors, and anlge bisectors of triangles, and use their properties to solve problems (e.g. find points of concurrency, segment lengths, or angle measures) c. Apply the Triangle Inequality Theorem to determine if a triangle exists and the order of sides and angles. d. Solve problems involving the relationships when the altitude to the hypotenuse of a right triangle is drawn. e. Apply the Pythagorean Theorem and its converse to triangles to solve mathematical and real world problems. (e.g. shadows and poles, ladders) f. Identify and use Pythagorean Triples in right triangles to find lengths of the unknown side.	G.GPE.4 Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √**3) lies on the circle centered at** the origin and containing the point (0, 2). G.GPE.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point). 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 area of triangles and rectangles, e.g., using the distance formula.*(*Modeling Standard) *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. * *G.SRT.9 (+) Derive the formula *A* = 1/2 *ab*

g. Identify and classify quadrilaterals, including parallelograms, rectangles, rhombi, squares, kites, trapezoids, and isosceles trapezoids using their properties.
j. Apply the Isosceles Triangle Theorem and its converse to triangles to solve mathematical and real world problems.

E. Comparing Congruent and Similar Geometric Figures
1. Similarity and Congruence
c. Identify similar figures and use ratios and proportions to solve mathematical and real world problems. (e.g. finding the height of a tree using the shadow of the tree, and the height and shadow of a person)
d. Use the definition of similarity to establish the congruence of angles, proportionality of sides, and scale factor of two similar polygons.
g. Determine the geometric mean between two numbers and use it to solve problems. (e.g. find the lengths of segments in right triangles.)

F. Using length, Area, Perimeter, and Volume to find quantities and solve problems
1. Area and Perimeter
a. Find the perimeter and area of common plane figures, including triangles, quadrilaterals, regular polygons, and irregular figures, for given information using appropriate units of measurement.

G. Relating Geometric Ideas to the Coordinate Plane
1. Coordinate Geometry
a. Use slope to distinguish between and write equations for parallel and perpendicular lines.
b. Apply the midpoint and distance formulas to points and segments to find midpoints, distance, and missing information.
c. Use coordinate geometry to solve problems about geometric figures (e.g. segments, triangles, quadrilaterals)

H. Investigating and Applying basic Ideas of Trigonometry
1. Introduction to Trigonometry
a. Apply properties of 45-45-90, and 30-60-90 triangles to determine lengths of sides of triangles.
*b. Find the sine, cosine, and tangent ratios of acute angles given the side lengths of right triangles.
*c. Use the trigonometric ratios to find the sides or angles of right triangles and to solve real world problems (e.g. use angles of elevation and depression to find missing measures

sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.

*G.SRT.10 (+) Prove the Laws of Sines and Cosines 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).

Gaps to be Addressed:

Completion 2013	*KY.9-12.M.SC.7 Measuring Physical Attributes: Students will apply special right triangles and the converse of the Pythagorean theorem to solve realistic problems*

Learning Targets from KDE Deconstructed Standards
I can…

	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.GPE.4	• Recall previous understandings of coordinate geometry (including, but not limited to: distance, midpoint and slope formula, equation of a line, definitions of parallel and perpendicular lines, etc.) • From Appendix A: This unit has a close connection with the next unit. For example, a curriculum might merge G.GPE.1 and the unit 5 treatment of G.GPE.4 with the standards in this unit. Reasoning with triangles in this unit is limited to right triangles;	• Use coordinates to prove simple geometric theorems algebraically. • For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2). • e.g., derive the equation of a line through 2 points using similar right triangles.		

G.GPE.5	• Recognize that slopes of parallel lines are equal. • Recognize that slopes of perpendicular lines are opposite reciprocals (i.e, the slopes of perpendicular lines have a product of -1) • Find the equation of a line parallel to a given line that passes through a given point. • Find the equation of a line perpendicular to a given line that passes through a given point.	• Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems. • From Appendix A: Relate work on parallel lines in G.GPE.5 to work on A.REI.5 in High School Algebra 1 involving systems of equations having no solution or infinitely many solutions.		
G.GPE.6	• Recall the definition of ratio. • Recall previous understandings of coordinate geometry.	• Given a line segment (including those with positive and negative slopes) and a ratio, find the point on the segment that partitions the segment into the given ratio.		
G.GPE.7	• Use the coordinates of the vertices of a polygon to find the necessary dimensions for finding the perimeter (i.e., the distance between vertices). • Use the coordinates of the vertices of a triangle to find the necessary dimensions (base, height) for finding the area (i.e., the distance between vertices by counting, distance formula, Pythagorean Theorem, etc.). • Use the coordinates of the vertices of a rectangle to find the necessary dimensions (base, height) for finding the area (i.e., the distance between vertices by counting, distance formula).	• Formulate a model of figures in contextual problems to compute area and/or perimeter. • From Appendix A: G.GPE.7 provides practice with the distance formula and its connection with the Pythagorean theorem.		
G.SRT.6	• Names the sides of right triangles as related to an acute angle. • Recognize that if two right triangles have a pair of acute, congruent angles that the triangles are similar.	• Compare common ratios for similar right triangles and develop a relationship between the ratio and the acute angle leading to the trigonometry ratios.		
G.SRT.7	• Use the relationship between the sine and cosine of complementary angles.	• Explain how the sine and cosine of complementary angles are related to each other.		
G.SRT.8	• Recognize which methods could be used to solve right triangles in applied problems. • Solve for an unknown angle or side of a right triangle using sine, cosine, and tangent.	• Apply right triangle trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.		
G.SRT.9(+)	• Recall right triangle trigonometry to solve mathematical problems.	• Derive the formula $A = 1/2\ ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.		
G.SRT.10(+)	• Use the Laws of Sines and Cosines this to find missing angles or side length measurements.	• Prove the Law of Sines • Prove the Law of Cosines • Recognize when the Law of Sines or Law of Cosines can be applied to a problem and solve problems in context using them. • From Appendix A: With respect to the general case of Laws of Sines and Cosines, the definition of sine and cosine must be extended to obtuse angles.		

G.SRT.11(+)	• Determine from given measurements in right and non-right triangles whether it is appropriate to use the Law of Sines or Cosines.	• 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). • From Appendix A: With respect to the general case of the Laws of Sines and Cosines, the definition of sine and cosine must be extended to obtuse angles.		

Critical Vocabulary

Right triangles Trigonometry	• Angle of depression • Angle of elevation • Cosine • Sin	• Magnitude • Pythagorean triple • Resultant	• Initial point vector • Tangent • Terminal point

Strategies/Activities

Balanced Assessment:

Formative	Summative
Exit Slips, Journals, Gallery Walks, Self-evaluation Stop Light, Random Questioning, bell ringers	Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)

Resources Needed

Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry Core Standards Coach Books	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 28-30

Circles (9)
*Constructions (8)

ACT Quality Core	Common Core Standards
I can… B. 1. Mathematical Processes Learned in the Context of Increasingly Complex Mathematical and Real-World Problems a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems b. Use a variety of strategies to set up and solve increasingly complex problems c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems f. Make mathematical connections among concepts, across disciplines, and in everyday experiences concepts, explore relationships, g. decrease time spent on computations after a skill has been established) h. Apply previously learned algebraic and geometric concepts to more advances problems C. Using Logic and Proof to reason mathematically 1. Logic and Proof b. Use inductive reasoning to make conjectures and deductive reasoning to arrive at valid conclusions. f. Prove that two triangles are congruent by applying the SSS, ASA, AAS, HL congruence statements. g. Use the principle that corresponding parts of congruent triangles are congruent to solve problems. h. Use several methods, including AA, SAS, SSS to prove that two triangles are similar, corresponding sides are proportional, and corresponding angles are congruent. D. Idenitfying, Classifying, and Applying Properties of Geometric Figures in Space 1. Points, Lines, Planes, and Space a. Identify and Model plane figures, including collinear and non collinear points, lines, segments, rays, and angles, using appropriate mathematical symbols *d. Use construction techniques, including straight edge and compass, to bisect and trisect segments and to create parallel and perpendicular lines, and parallel and perpendicular bisectors, and angle bisectors. *e. Locate, describe, and draw a locus in a plane or space 2. Polygons i. Apply the Angle sum theorem for triangles and polygons to find interior and exterior angle measures given the number of sides, to find the number of sides given angles measures, and to solve real world problems.	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. 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).*(*Modeling Standard) 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).* (*Modeling Standard) G.MG.3 Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*(*Modeling Standard) G.GPE.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. G.GPE.2 Derive the equation of a parabola given a focus and directrix. G.GPE.3(+) Derive the equations of ellipses and hyperbolas given the foci,

3. Circles
a. Identify and define line segments associated with circles(e.g. radi, diameter, chords, secants, tangents

E. Comparing Congruent and Similar Geometric Figures
1.Similarity and Congruence
- b. Identify congruent figures and their corresponding parts
- c. Identify similar figures and use ratio and proportions to solve mathematical and real world problems(e.g. finding the height of a tree using the shadow of the tree and the height and shadow of a person.)
- d. Use the definition of similarity to establish the congruence of angles, proportionality of sides, and scale factor of two similar polygons.

F.Using Length, Area, Perimeter, and Volume to find quantities and solve problems
1. Area and Perimeter
- a. Find the perimeter and area of common plane figures, including triangles, quadrilaterals, regular polygons, and irregular figures, from given information using appropriate units of measurement.
- d. Find arc lengths and circumference of circles from given information(e.g. radius, diameter, coordinates)
- e. Find the area of a circle and the area of a sector of a circle from given information(e.g. radius, diameter, coordinates)

G.Relating Geometric Ideas to the coordinate plane
1.Coordinate Geometry
- c. Apply the midpoint and distance formulas to points and segments to find midpoints, distances, and missing information.
- d. Use coordinate geometry to solve problems about geometric figures(e.g. segments, triangles, quadrilaterals)
- e. Write equations for circles in standard form and solve problems using equations and graphs

using the fact that the sum or difference of distances from the foci is constant

* 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.

Gaps to be Addressed:

Completion 2015	*KY.9-12.G.SC.1 Shapes and Relationships: Students will identify and apply the definitions, properties and theorems about line segments, rays and angles and use them to prove theorems in Euclidean geometry, solve problems and perform basic geometric constructions using a straight edge and a compass*
Completion 2015	*KY.9-12.G.SC.11 Shapes and Relationships: Students will draw and construct representations of two-dimensional figures and three-dimensional objects using a variety of tools*

Learning Targets from KDE Deconstructed Standards
I can…

	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.C.1	• Recognize when figures are similar. (Two figures are similar if one is the image of the other under a transformation from the plane into itself that multiplies all distances by the same positive scale factor, *k*. That is to say, one figure is a dilation of the other.)	• Compare the ratio of the circumference of a circle to the diameter of the circle. • Discuss, develop and justify this ratio for several circles. • Determine that this ratio is constant for all circles.		
G.C.2	• Identify inscribed angles, radii, chords, central angles, circumscribed angles, diameter, tangent. • Recognize that inscribed angles on a diameter are right angles. • Recognize that radius of a circle is perpendicular to the radius at the point of tangency.	• Examine the relationship between central, inscribed and circumscribed angles by applying theorems about their measures.		

G.C.3	• Define inscribed and circumscribed circles of a triangle. • Recall midpoint and bisector definitions. • Define a point of concurrency.	• Prove properties of angles for a quadrilateral inscribed in a circle.	• Construct inscribed circles of a triangle • Construct circumscribed circles of a triangle.	
G.C.4(+)	• Recall vocabulary: • Tangent • Radius • Perpendicular bisector • Midpoint • Identify the center of the circle	• Synthesize theorems that apply to circles and tangents, such as: • Tangents drawn from a common external point are congruent. • A radius is perpendicular to a tangent at the point of tangency.	• Construct the perpendicular bisector of the line segment between the center C to the outside point P. • Construct arcs on circle C from the midpoint Q, having length of CQ. • Construct the tangent line.	
G.C.5	• Recall how to find the area and circumference of a circle. • Explain that 1° = Π/180 radians • Recall from G.C.1, that all circles are similar. • Determine the constant of proportionality (scale factor).	• Justify the radii of any two circles (r1 and r2) and the arc lengths (s1 and s2) determined by congruent central angles are proportional, such that r1 /s1 = r2/s2 • Verify that the constant of a proportion is the same as the radian measure, Θ, of the given central angle. Conclude s = r Θ • From Appendix A: Emphasize the similarity of all circles. Note that by similarity of sectors with the same central angle, arc lengths are proportional to the radius. Use this as a basis for introducing radian as a unit of measure. It is not intended that it be applied to the development of circular geometry in this course		
G.MG.1	• Use measures and properties of geometric shapes to describe real world objects	• Given a real world object, classify the object as a known geometric shape - use this to solve problems in context. • From Appendix A: Focus on situations in which the analysis of circles is required.		
G.MG.2	• Define density.	• Apply concepts of density based on area and volume to model real-life situations (e.g., persons per square mile, BTUs per cubic foot).		
G.MG.3	• Describe a typographical grid system.	• Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). • From Appendix A: Focus on situations well modeled by trigonometric ratios for acute angles.		

G.GPE.1	• Define a circle. • Use Pythagorean Theorem. • Complete the square of a quadratic equation.	• Derive equation of a circle using the Pythagorean Theorem – given coordinates of the center and length of the radius. • Determine the center and radius by completing the square. • From Appendix A: Emphasize the similarity of all circles. Note that by similarity of sectors with the same central angle, arc lengths are proportional to the radius. Use this as a basis for introducing radian as a unit of measure. It is not intended that it be applied to the development of circular trigonometry in this course.		
G.GPE.2	• Define a parabola including the relationship of the focus and the equation of the directrix to the parabolic shape. • From Appendix A: The directrix should be parallel to a coordinate axis.	• Derive the equation of parabola given the focus and directrix.		
G.GPE.3				
*G.CO.12	• Explain the construction of geometric figures using a variety of tools and methods.	• Apply the definitions, properties and theorems about line segments, rays and angles to support geometric constructions. • Apply properties and theorems about parallel and perpendicular lines to support constructions. • From Appendix A: Build on prior student experience with simple constructions. Emphasize the ability to formalize and explain how these constructions result in the desired objects. Some of these constructions are closely related to previous standards and can be introduced in conjunction with them.	• Perform geometric constructions including: 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, using a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	
*G.CO.13	• Note: Underpinning performance, reasoning, and knowledge targets, if applicable, are addressed in G.CO.12 • From Appendix A: Build on prior student experience with simple constructions. Emphasize the ability to formalize and explain how these constructions result in the desired objects. • Some of these constructions are closely related to previous standards and can be introduced in conjunction with them.			• Construct an equilateral triangle, a square and a regular hexagon inscribed in a circle.

Critical Vocabulary					
CIRCLES AND CONSTRUCTION	Chord Inscribed angle Intercepted arc	Straightedge Secant	Locus Trisect Bisect	Angle bisector Compass Perpendicular bisector	Point of tangency Tangent to a circle Standard form of an equation of a circle

Strategies/Activities

Resources Needed	
Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry Core Standards Coach Books	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 31-33

Transformations in Space and on the coordinate plane (6)

ACT Quality Core	Common Core Standards
I can… B. 1. Mathematical Processes Learned in the Context of Increasingly Complex Mathematical and Real-World Problems a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems b. Use a variety of strategies to set up and solve increasingly complex problems d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly f. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems g. Make mathematical connections among concepts, across disciplines, and in everyday experiences h. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships, i. decrease time spent on computations after a skill has been established) j. Apply previously learned algebraic and geometric concepts to more advances problems C. Using Logic and Proof to reason mathematically 1. Logic and Proof b. Use inductive reasoning to make conjectures and deductive reasoning to arrive at valid conclusions. E.Comparing Congruent and Similar Geometric Figures 1. Similarity and Congruence a. Determine points or lines of symmetry and apply the properties of symmetry to figures b. Identify congruent figures and their corresponding parts f. Identify and draw images of transformations and use their properties to solve problems. g. Apply relationships between perimeters of similar figures, areas of similar figures, and volumes of similar figures, in terms of scale factor, to solve mathematical and real world problems. G.Relating Geometric Ideas to the Coordinate Plane 1. Coordinate Geometry e.Determine the effect of reflections, rotations, translations, and dilations, and their compositions on the coordinate plane.	G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment based on the undefined notions of a point, line, distance along a line and distance around a circular arc. G.CO.2 Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch) G.CO.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. G.CO.4 Develop definitions of rotations, reflections and translations in terms of angles, circles, perpendicular lines, parallel lines and line segments. G.CO.5 Given a geometric figure and a rotation, reflection or translation, draw the transformed figure using, e.g. graph paper, tracing paper or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

Learning Targets from KDE Deconstructed Standards I can…				
	Knowledge Skills	Reasoning Skills	Performance Skills	Product Skills
G.CO.1				
G.CO.2	• Describe the different types of transformations including translations, reflections, rotations and dilations. • Describe transformations as functions that take points in the coordinate plane as inputs and give other points as outputs	• Represent transformations in the plane using, e.g., transparencies and geometry software. • Write functions to represent transformations. • Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch) • From Appendix A: Build on student experience with rigid motions from earlier grades. Point out the basis of rigid motions in geometric concepts, e.g, translations move points a specific distance along a line parallel to a specified line; rotations move objects along a circular arc with a specified center through a specified angle.		
G.CO.3	• Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and/or reflections that carry it onto itself. • From Appendix A: Build on student experience with rigid motions from earlier grades. Point out the basis of rigid motions in geometric concepts, e.g, translations move points a specific distance along a line parallel to a specified line; rotations move objects along a circular arc with a specified center through a specified angle.			
G.CO.4	• Recall definitions of angles, circles, perpendicular and parallel lines and line segments.	• Develop definitions of rotations, reflections and translations in terms of angles, circles, perpendicular lines, parallel lines and line segments. • From Appendix A: Build on student experience with rigid motions from earlier grades. Point out the basis of rigid motions in geometric concepts, e.g., translations move points a specific distance along a line parallel to a specified line; rotations move objects along a circular arc with a specified center through a specified angle.		
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.	• Draw a transformed figure and specify the sequence of transformations that were used to carry the given figure onto the other. • From Appendix A: Build on student experience with rigid motions from earlier grades. Point out the basis of rigid motions in geometric concepts, e.g., translations move points a specific distance along a line parallel to a specified line; rotations move objects along a circular arc with a specified center through a specified angle.		

Critical Vocabulary				
Transformation	• Dilation • Glide Reflection • Image	• Reflection • Rotation • Symmetry • Tessellation	• Transformation • Translation	• Isometry • Preimage

Strategies/Activities

Balanced Assessment:	
Formative Exit Slips, Journals, Gallery Walks, Self-evaluation Stop Light, Random Questioning, bell ringers	Summative Common (PLC Teams will design the common assessments, i.e., grade level, and/or depts..)

Resources Needed	
Prentice Hall Geometry textbook, student companion Prentice Hall Geometry Transition Packet for CCS ACT Quality Core Geometry Core Standards Coach Books	http://www.mathopenref.com/ http://www.geogebra.org/cms/en/download http://www.studyisland.com

Weeks 34-36
Review/ EOC Testing