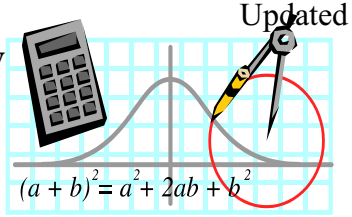
Updated 7/31/2013

HENRY COUNTY SCHOOLS

GRADE 10: CCGPS Math II/ Analytic Geometry
MATHEMATICS - Curriculum Map

(adapted from Georgia Department of Education)

UPDATED JULY 2013



Common Core Georgia Performance Standards						
SEMESTER 1				**SEMESTER 2**		
Unit 1	**Unit 2**	**Unit 3**	**Unit 4**	**Unit 5**	**Unit 6**	**Unit 7**
7 weeks	2 weeks	5 weeks	4 weeks	8 weeks	4 weeks	3 weeks
Similarity, Congruence and Proofs	**Right Triangle Trigonometry**	**Circles and Volume**	**Extending the Number System**	**Quadratic Functions**	**Modeling Geometry**	**Applications of Probability**
MCC9-12.G.SRT.1 **MCC9-12.G.SRT.2** **MCC9-12.G.SRT.3** **MCC9-12.G.SRT.4** **MCC9-12.G.SRT.5** **MCC9-12.G.CO.6** **MCC9-12.G.CO.7** **MCC9-12.G.CO.8** **MCC9-12.G.CO.9** **MCC9-12.G.CO.10** **MCC9-12.G.CO.11** **MCC9-12.G.CO.12** **MCC9-12.G.CO.13**	**MCC9-12.G.SRT.6** **MCC9-12.G.SRT.7** **MCC9-12.G.SRT.8**	**MCC9-12.G.C.1** **MCC9-12.G.C.2** **MCC9-12.G.C.3** **MCC9-12.G.C.4(+)** **MCC9-12.G.C.5** **MCC9-12.G.GMD.1** **MCC9-12.G.GMD.2(+)** **MCC9-12.G.GMD.3**	**MCC9-12.N.RN.1** **MCC9-12.N.RN.2** **MCC9-12.N.RN.3** **MCC9-12.N.CN.1** **MCC9-12.N.CN.2** **MCC9-12.N.CN.3(+)** **MCC9-12.A.APR.1**	**MCC9-12.N.CN.7** **MCC9-12.A.SSE.1a,b** **MCC9-12.A.SSE.2** **MCC9-12.A.SSE.3a,b** **MCC9-12.A.CED.1, 2, 4** **MCC9-12.A.REI.4a,b** **MCC9-12.A.REI.7** **MCC9-12.F.IF.4 - 6** **MCC9-12.F.IF.7a, 8a** **MCC9-12.F.IF.9** **MCC9-12.F.BF.1a,b** **MCC9-12.F.BF.3** **MCC9-12.F.LE.3** **MCC9-12.S.ID.6a**	**MCC9-12.A.REI.7** **MCC9-12.G.GPE.1** **MCC9-12.G.GPE.2** **MCC9-12.G.GPE.4**	**MCC9-12.S.CP.1** **MCC9-12.S.CP.2** **MCC9-12.S.CP.3** **MCC9-12.S.CP.4** **MCC9-12.S.CP.5** **MCC9-12.S.CP.6** **MCC9-12.S.CP.7**
Overarching Essential Questions						
"How can I use what I know to prove similarity and congruence using triangles?"	*"How do I use similarity to derive right triangle trigonometry that model real world situations?*	*"How do I define, evaluate, and compare characteristics of circles using tangent lines, secant lines, angles and line segments?"*	*"How do I summarize, represent, interpret, and extend the number system beyond real numbers?"*	*"How do I analyze, explain, and verify processes of solving, graphing, and comparing quadratic functions, and systems that model real life situations?*	*"How can I use the coordinate plane and algebraic methods to solve systems that model real life phenomena?"*	*"How can I make predictions using theoretical probabilities of compound events?*

Grade 9-12 Key:

Number and Quantity Strand: RN = The Real Number System, Q = Quantities, CN = Complex Number System, VM = Vector and Matrix Quantities
Algebra Strand: SSE = Seeing Structure in Expressions, APR = Arithmetic with Polynomial and Rational Expressions, CED = Creating Equations, REI = Reasoning with Equations and Inequalities
Functions Strand: IF = Interpreting Functions, LE = Linear and Exponential Models, BF = Building Functions, TF = Trigonometric Functions
Geometry Strand: CO = Congruence, SRT = Similarity, Right Triangles, and Trigonometry, C = Circles, GPE = Expressing Geometric Properties with Equations, GMD = Geometric Measurement and Dimension, MG = Modeling with Geometry
Statistics and Probability Strand: ID = Interpreting Categorical and Quantitative Data, IC = Making Inferences and Justifying Conclusions, CP = Conditional Probability and the Rules of Probability, MD = Using Probability to Make Decisions

Specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

Standards for Mathematical Practice are addressed through the learning tasks throughout the year!

First Semester

Unit 1 Similarity, Congruence and Proofs **August 5 – September 20**	Unit 2 Right Triangle Trigonometry **September 23 – October 4**	Unit 3 Circles and Volume **October 14 – November 15**	Unit 4 Extending the Number System **November 18 – December 20 (Semester Review & Exam: December 16-20)**
Common Core Georgia Performance Standards			
Understand similarity in terms of similarity transformations **MCC9-12.G.SRT.1** Verify experimentally the properties of dilations given by a center and a scale factor: **a**. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. **b.** The dilation of a line segment is longer or shorter in the ratio given by the scale factor. **MCC9-12.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. **MCC9-12.G.SRT.3** Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar. **Prove theorems involving similarity** **MCC9-12.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. **MCC9-12.G.SRT.5** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. **Understand congruence in terms of rigid motions** **MCC9-12.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. **MCC9-12.G.CO.7** Use the definition of	**Define trigonometric ratios and solve problems involving right triangles** **MCC9-12.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. **MCC9-12.G.SRT.7** Explain and use the relationship between the sine and cosine of complementary angles. **MCC9-12.G.SRT.8** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	**Understand and apply theorems about circles** **MCC9-12.G.C.1** Prove that all circles are similar. **MCC9-12.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. **MCC9-12.G.C.3** Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. **MCC9-12.G.C.4 (+)** Construct a tangent line from a point outside a given circle to the circle. **Find arc lengths and areas of sectors of circles** **MCC9-12.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. **Explain volume formulas and use them to solve problems** **MCC9-12.G.GMD.1** Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments. **MCC9-12.G.GMD.2 (+)** Give an informal argument using Cavalieri's principle for the	**Extend the properties of exponents to rational exponents** **MCC9-12.N.RN.1** Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. **MCC9-12.N.RN.2** Rewrite expressions involving radicals and rational exponents using the properties of exponents. **Use properties of rational and irrational numbers** **MCC9-12.N.RN.3** Explain why the sum or product of rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational. **Perform arithmetic operations with complex numbers** **MCC9-12.N.CN.1** Know there is a complex number i such that $i^2 = -1$, and every complex number has the form a + bi with a and b real. **MCC9-12.N.CN.2** Use the relation i2 = –1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. **MCC9-12.N.CN.3 (+)** Find the conjugate of a complex number; use conjugates to find ~~moduli and~~ quotients of complex numbers. **Perform arithmetic operations on polynomials** **MCC9-12.A.APR.1** Understand that polynomials form a system analogous to

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. **MCC9-12.G.CO.8** Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. **Prove geometric theorems** **MCC9-12.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. **MCC9-12.G.CO.10** Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180 degrees; 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. **MCC9-12.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. **Make geometric constructions** **MCC9-12.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. **MCC9-12.G.CO.13** Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.		formulas for the volume of a sphere and other solid figures. MCC9-12.G.GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★	the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. (Focus on polynomial expressions that simplify to forms that are linear or quadratic in a positive integer power of x.)

Second Semester

Unit 5 Quadratic Functions **January 7 – March 7**	Unit 6 Modeling Geometry **March 11 – April 18**	Unit 7 Applications of Probability **April 21 – May 23**
Common Core Georgia Performance Standards		
Use complex numbers in polynomial identities and equations. **MCC9-12.N.CN.7** Solve quadratic equations with real coefficients that have complex solutions. **Interpret the structure of expressions** **MCC9-12.A.SSE.1** Interpret expressions that represent a quantity in terms of its context.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **MCC9-12.A.SSE.1a** Interpret parts of an expression, such as terms, factors, and coefficients.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **MCC9-12.A.SSE.1b** Interpret complicated expressions by viewing one or more of their parts as a single entity.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **MCC9-12.A.SSE.2** Use the structure of an expression to identify ways to rewrite it. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **Write expressions in equivalent forms to solve problems** **MCC9-12.A.SSE.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **MCC9-12.A.SSE.3a** Factor a quadratic expression to reveal the zeros of the function it defines.★ **MCC9-12.A.SSE.3b** Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.★ **Create equations that describe numbers or relationships** **MCC9-12.A.CED.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, ~~and simple rational and exponential functions.~~★ **MCC9-12.A.CED.2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **MCC9-12.A.CED.4** Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *(Focus on quadratic functions; compare with linear and exponential functions*	**Solve systems of equations** **MCC9-12.A.REI.7** Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. **Translate between the geometric description and the equation for a conic section** **MCC9-12.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. **MCC9-12.G.GPE.2** Derive the equation of a parabola given a focus and directrix. **Use coordinates to prove simple geometric theorems algebraically** **MCC9-12.G.GPE.4** Use coordinates to prove simple geometric theorems algebraically. *(Restrict to context of circles and parabolas)*	**Understand independence and conditional probability and use them to interpret data** **MCC9-12.S.CP.1** Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").★ **MCC9-12.S.CP.2** Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.★ **MCC9-12.S.CP.3** Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.★ **MCC9-12.S.CP.4** Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.★ **MCC9-12.S.CP.5** Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.★ **Use the rules of probability to compute probabilities of compound events in a uniform probability model** **MCC9-12.S.CP.6** Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.★ **MCC9-12.S.CP.7** Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.★	

studied in Coordinate Algebra.) Solve equations and inequalities in one variable **MCC9-12.A.REI.4** Solve quadratic equations in one variable. **MCC9-12.A.REI.4a** Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. **MCC9-12.A.REI.4b** Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. Solve systems of equations **MCC9-12.A.REI.7** Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. Interpret functions that arise in applications in terms of the context **MCC9-12.F.IF.4** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; ~~and periodicity~~.★ **MCC9-12.F.IF.5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **MCC9-12.F.IF.6** Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* Analyze functions using different representations **MCC9-12.F.IF.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **MCC9-12.F.IF.7a** Graph ~~linear and~~ quadratic functions and show intercepts, maxima, and minima.★ **MCC9-12.F.IF.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **MCC9-12.F.IF.8a** Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. **MCC9-12.F.IF.9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *(Focus on quadratic functions; compare with*		

linear and exponential functions studied in Coordinate Algebra.) **Build a function that models a relationship between two quantities** **MCC9-12.F.BF.1** Write a function that describes a relationship between two quantities.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **MCC9-12.F.BF.1a** Determine an explicit expression, a recursive process, or steps for calculation from a context. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **MCC9-12.F.BF.1b** Combine standard function types using arithmetic operations. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **Build new functions from existing functions** **MCC9-12.F.BF.3** Identify the effect on the graph of replacing f(x) by *f*(x) + k, k f(x), *f*(kx), and *f*(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)* **Construct and compare linear, quadratic, and exponential models and solve problems** **MCC9-12.F.LE.3** Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.★ **Summarize, represent, and interpret data on two categorical and quantitative variables** **MCC9-12.S.ID.6** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.★ **MCC9-12.S.ID.6a** Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, ~~and exponential~~ models.★		

HENRY COUNTY SCHOOLS

Updated 7/31/2013

Unit 1
Similiarity, Congruence, and Proofs

CCGPS Standards Addressed:
MCC9-12.G.SRT.1-5 MCC9-12.G.CO.6-13

Essential Question

"How can I use what I know to prove similarity and congruence using triangles?"

Key Vocabulary
*adjacent angles *alternate exterior angles *alternate interior angles *angle *bisector *centroid *circumcenter*coincidental *complementary angles *congruent *congruent figures *corresponding angles * corresponding sides * dilation* endpoints* equiangular * equilateral * exterior angle of a polygon* incenter *intersecting lines * intersection *inscribed polygon *line *line seqment * linear pair *median of a triangle *midsegment *orthocenter *parallel lines *perpendicular bisector * perpendicular lines *plane *point *proportion *ratio *ray *reflection *reflection line *regular polygon *remote interior angles of a triangle *rotation *same-side interior angles *same-side exterior angles *scale factor *similar figures *skew lines *supplementary angles *transformation *translation *transversal *vertical angles

Prerequisite Skills

It is expected that students will have prior knowledge/experience related to the concepts and skills identified below. It may be necessary to pre-assess in order to determine if time needs to be spent on conceptual activities that help students develop a deeper understanding of these ideas.

- Understand and use reflections, translations, and rotations.
- Define the following terms: circle, bisector, perpendicular and parallel.
- Solve multi-step equations.
- Understand angle sum and exterior angle of triangles.
- Know angles created when parallel lines are cut by a transversal.
- Know facts about supplementary, complementary, vertical, and adjacent angles.
- Solve problems involving scale drawings of geometric figures.
- Draw geometric shapes with given conditions.
- Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations.
- Draw polygons in the coordinate plane given coordinates for the vertices.

Suggested Learning Resources/ Performance Tasks

- GADOE CCGPS Frameworks
- Henry County Flexbooks
- Mathematics Assessment Project (www.map.mathshell.org)
- Constructions inscribed in a Circle
- Proving 2 Triangles Congruent
- Similar Triangles
- Shadow Math
- Triangle Properties Theorems (Part 1)
- Triangle Proportionality Theorem
- Proving Similar Triangles
- Hopewell
- Lunchlines
- Centers of Triangles
- Constructing with Diagonals (Modified)
- Proving Quadrilaterals in the Coordinate Plane
- Find that side or angle
- Clyde's Construction Crew

Enduring Understandings

Students will understand…

- enlarge or reduce a geometric figure using a given scale factor.
- given a figure in the coordinate plane, determine the coordinates resulting from a dilation.
- compare geometric figures for similarity and describe similarities by listing corresponding parts.
- use scale factors, length ratios, and area ratios to determine side lengths and areas of similar geometric figures.
- perform basic constructions using a straight edge and compass and describe the strategies used.
- use congruent triangles to justify constructions.
- show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent (CPCTC).
- identify the minimum conditions necessary for triangle congruence (ASA, SAS, and SSS).
- understand, explain, and demonstrate why ASA, SAS, or SSS are sufficient to show congruence.
- prove theorems about lines and angles.
- prove theorems about triangles.
- prove properties of parallelograms.

Understand similarity in terms of similarity transformations

MCC9-12.G.SRT.1 Verify experimentally the properties of dilations given by a center and a scale factor:
- **a.** A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
- **b.** The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

MCC9-12.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.
MCC9-12.G.SRT.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.

Prove theorems involving similarity

MCC9-12.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.
MCC9-12.G.SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Understand congruence in terms of rigid motions

MCC9-12.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.
MCC9-12.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.
MCC9-12.G.CO.8 Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

Prove geometric theorems

MCC9-12.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.
MCC9-12.G.CO.10 Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180 degrees; 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.
MCC9-12.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.

Make geometric constructions

MCC9-12.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.
MCC9-12.G.CO.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

CCGPS Math II/Analytic Geometry – Unit 1: Similiarity, Congruence, and Proofs

Sample Daily Lesson Plan

Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
August 5	August 6	August 7	August 8	August 9
Pre-Assessment: Standards addressed in this unit	Vocabulary: Geometry basics	Basic Constructions (copying a segment, angle, bisecting an angle, perpendicular bisector) using Carnegie Book/Task	**Constructions inscribed in a circle TASK**	Assessment: Geometry vocabulary/constructions
Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
August 12	August 13	August 14	August 15	August 16
Exploring congruence/rigid motion **M.CC9-12 G.OC.6** *See Carnegie*	Recap/ Triangle congruence/corresponding sides (SSS/ASA/SAS)	Triangle congruence (HL)-**Task**: Proving Triangle's congruence	More practice on triangle congruence	Formative Assessment Lesson: Triangle Congruence www.map.mathshell.org
Day 11	**Day 12**	**Day 13**	**Day 14**	**Day 15**
August 19	August 20	August 21	August 22	August 23
Dilations in the Coordinate Plane Task	Application of Dilation: AA similarity Similar Triangle Task/Notes Theorem	**Shadow Math Task** Application of Dilation/HW/Practice Carnegie4.1/4.6	Review/introduce proving similarity/SAS	Assessment (Concepts address during days 11-13)
Day 16	**Day 17**	**Day 18**	**Day 19**	**Day 20**
August 26	August 27	August 28	August 29	August 30
Proportionality Theorem Task	Prove Pythagorean Theorem using Similarity (SRT4)/**Hopewell Task**	Recap/Application & Practice	Recap/Application & Practice	Mid Unit Assessment

	Day 21	**Day 22**	**Day 23**	**Day 24**
September 2	September 3	September 4	September 5	September 6
Labor Day	Introduce the properties of lines, angles etc. vocabulary (G.CO.9) **Lunchline Task** HW/ Carnegie 7.5 perpendicular bisector	Discussion on Lunch Line Task – Discussion-Skill & Application (GCO.9)	Points of Concurrency introduction	Formative Assessment Lesson www.map.mathshell.org
Day 25	**Day 26**	**Day 27**	**Day 28**	**Day 29**
September 9	September 10	September 11	September 12	September 13
Quadrilaterals Introduction	Proving Quadrilaterals in the Coordinate Plane	Day 2 Proving Quadrilaterals in the Coordinate Plane Task	Review of Unit 1 concepts	Review of Unit 1 concepts
Day 30	**Day 31**			
September 16	September 17			
Unit 1 Assessment Day 1	Unit 1 Assessment Day 2			

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Updated 7/31/2013

Unit 2
Right Triangle Trignometry

Key Vocabulary
*adjacent side *angle of depression * angle of elevation * complementary angles *opposite side *similar triangles

Essential Question
"How do I use similarity to derive right triangle trigonometry that model real world situations?

CCGPS Standards Addressed:
MCC9-12.G.SRT.6-8

Prerequisite Skills

It is expected that students will have prior knowledge/experience related to the concepts and skills identified below. It may be necessary to pre-assess in order to determine if time needs to be spent on conceptual activities that help students develop a deeper understanding of these ideas.

- number sense
- computation with whole numbers, integers and irrational numbers, including application of order of operations
- operations with algebraic expressions
- simplification of radicals
- basic geometric constructions
- properties of parallel and perpendicular lines
- applications of Pythagorean Theorem
- properties of triangles, quadrilaterals, and other polygons
- ratios and properties of similar figures
- properties of triangles

Suggested Learning Resources/ Performance Tasks

- Find that side or angle
- Clyde's Construction Crew
- GADOE CCGPS Frameworks
- LearnZillion
- Henry County Flexbooks
- Mathematics Assessment Project (www.map.mathshell.org)

Enduring Understandings

Students will understand…

- Similar right triangles produce trigonometric ratios.
- Trigonometric ratios are dependent only on angle measure.
- Trigonometric ratios can be used to solve application problems involving right triangles.

Define trigonometric ratios and solve problems involving right triangles.

MCC9-12.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.

MCC9-12.G.SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.

MCC9-12.G.SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

CCGPS Math II/Analytic Geometry - Unit 2: Right Triangle Trignometry

Sample Daily Lesson Plan

		Day 1	**Day 2**	**Day 3**
		September 18	September 19	September 20
		Pre-assessment and Introduce Special Right Triangles 30/36/90 and 45/45/90	Recap/Discovering Special Right Triangles Learning	Discovering Special Right Triangle Day 2
Day 4	**Day 5**	**Day 6**	**Day 7**	**Day 8**
September 23	September 24	September 25	September 26	September 27
Define Trig Ratios and Explore Sine and Cosine as complements	Skills practice finding length side/angle measure using trig ratios (calculator lesson)	Reinforcing skill on finding side length/angle measure	Application (special right triangles; trig ratios)	Assessment-Special Right Triangles, Trig Ratios, Word problems
Day 9	**Day 10**	**Day 11**	**Day 12**	**Day 13**
September 30	October 1	October 2	October 3	October 4
Application (with or without diagrams)	Application (with or without diagrams)	Application (with or without diagrams)	Review	Assessment Unit 2
October 7	October 8	October 9	October 10	October 11
Fall Break				

HENRY COUNTY SCHOOLS

Updated 7/31/2013

Unit 3
Circles and Volume

CCGPS Standards Addressed:
MCC9-12.G.G.C.1-5,

Essential Question
"How do I define, evaluate, and compare characteristics of circles using tangent lines, secant lines, angles and line segments?"

Key Vocabulary
*arc *arc length *arc measure * Cavalieri's Principle *Central Angle *Chord *circumcenter *circumscribed circle *composite figures *inscribed *inscribed angle * inscribed circle *inscribed polygon *lateral area *major and minor arcs *point of tangency *secant line *secant segment *sector *slant height *tangent line

Suggested Learning Resources/ Performance Tasks

GADOE CCGPS Frameworks
LearnZillion
Henry County Flexbooks
Mathematics Assessment Project (www.map.mathshell.org)

Enduring Understandings

Students will understand…

- Understand and Apply Theorems about Circles
- Find Arc Lengths and Areas of Sectors of Circles
- Explain Volume Formulas and Use them to solve problems

Prerequisite Skills

The introduction to all of the parts of a circle and the relationships of all of those parts to each other will be new to students this year. The concepts of Area, Surface Area, and Volume of triangles, special quadrilaterals, and right rectangular prisms were introduced in the 6th Grade Unit 5. This knowledge was built on in the 7th Grade Unit 5 and expanded to include the slicing of right rectangular pyramids. The Volumes of Cones, Cylinders, and Spheres were previously covered in the 8th Grade Unit 3. The purpose of re-visiting these formulas here in Analytic Geometry is to formalize the students understanding of the development of these formulas; to take them from a memorization and use of the formulas to an understanding and application level.

Understand and apply theorems about circles
MCC9-12.G.C.1 Prove that all circles are similar.
MCC9-12.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.
MCC9-12.G.C.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.
MCC9-12.G.C.4 (+) Construct a tangent line from a point outside a given circle to the circle.
Find arc lengths and areas of sectors of circles
MCC9-12.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.
Explain volume formulas and use them to solve problems
MCC9-12.G.GMD.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.
MCC9-12.G.GMD.2 (+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.
MCC9-12.G.GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★

CCGPS Math II/Analytic Geometry – Unit 3: Circles and Volume

Sample Daily Lesson Plan

Day 1	Day 2	Day 3	Day 4	Day 5
October 14	**October 15**	**October 16**	**October 17**	**October 18**
Task1: Circles and Relationships among angles	Task2: Investigating Angle Relationships	Task2: Investigating Angle Relationships - Application	Investigating Angle Relationships- Applications & skills practice (worksheets)	Assessment
Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
October 21	October 22	October 23	October 24	October 25
Task3: Chords/Secants/Tangents- Graphic organizer/ Discovery using Technology	Task3: Chords/Secants/Tangents /worksheets - segment lengths	Task3: Chords/Secants/ Tangents – word/Applications	Task3: Chords/Secants/ Tangents – Word problems /applications/Practice	Formative Assessment Lesson www.map.mathshell.org
Day 11	**Day 12**	**Day 13**	**Day 14**	**Day 15**
October 28	October 29	October 30	October 31	November 1
Task3: Chords/Secants/ Tangents Construction part 4 (Q1 & Q2)	Arc lengths/ Area of sectors	Practice/Review	Practice/Review – angles/segment lengths	Mid-Unit Assessment
Day 16		**Day 17**	**Day 18**	**Day 19**
November 4	November 5	November 6	November 7	November 8
Task4: Arc length & area of sector – part 1/Cookie Lab	**Professional Day School Closed for Students**	Task4: Arc length & area of sector – part 2/ Understanding formulas	Skills practice/ application – word problems	Assessment/arc length & area of sectors
Day 20	**Day 21**	**Day 22**	**Day 23**	**Day 24**
November 11	November 12	November 13	November 14	November 15
Task: Volume- Cylinder/cone Must know formulas	Application/ Practice	Application/ Practice	Application/ Practice	Review whole unit
Day 25	**Day 26**			
November 18	November 19			
Unit 3:Assessment (FR-Construction, multistep)	Unit 3: Assessment (MC)			
Thanksgiving Break *November 25 – 29, 2013*				

HENRY COUNTY SCHOOLS

Updated 7/31/2013

Unit 4
Extending the Number System

CCGPS Standards Addressed:
MCC9-12.N.RN.1-3 MCC9-12.C.CN.1-3 MCC9-12.A.APR.1

Essential Question
"How do I summarize, represent, interpret, and extend the number system beyond real numbers?"

Key Vocabulary
*binomial expression *complex conjugate *complex number *exponential functions *expression *monomial expression *nth roots *polynomial function *rational exponents *rational expression *rational number *standard form of a polygon *trinomial *whole numbers

Suggested Learning Resources/ Performance Tasks

GADOE CCGPS Frameworks
LearnZillion
Henry County Flexbooks
Mathematics Assessment Project (www.map.mathshell.org)

Enduring Understandings

Students will understand…

- *Nth* roots are inverses of power functions. Understanding the properties of power functions and how inverses behave explains the properties of *nth* roots.
- Real-life situations are rarely modeled accurately using discrete data. It is often necessary to introduce rational exponents to model and make sense of a situation.
- Computing with rational exponents is no different from computing with integral exponents.
- The complex numbers are an extension of the real number system and have many useful applications.
- Addition and subtraction of complex numbers are similar to polynomial operations.

Prerequisite Skills

It is expected that students will have prior knowledge/experience related to the concepts and skills identified below. It may be necessary to pre-assess in order to determine if time needs to be spent on conceptual activities that help students develop a deeper understanding of these ideas.

- number sense
- computation with whole numbers and integers, including application of order of operations
- operations with algebraic expressions
- simplification of radicals
- measuring length and finding perimeter and area of rectangles and squares
- laws of exponents, especially the power rule

Extend the properties of exponents to rational exponents.
MCC9-12.N.RN.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.
MCC9-12.N.RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.
Use properties of rational and irrational numbers.
MCC9-12.N.RN.3 Explain why the sum or product of rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.
Perform arithmetic operations with complex numbers.
MCC9-12.N.CN.1 Know there is a complex number i such that $i^2 = -1$, and every complex number has the form a + bi with a and b real.
MCC9-12.N.CN.2 Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
MCC9-12.N.CN.3 (+) Find the conjugate of a complex number; use conjugates to find ~~moduli and~~ quotients of complex numbers.
Perform arithmetic operations on polynomials
MCC9-12.A.APR.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. *(Focus on polynomial expressions that simplify to forms that are linear or quadratic in a positive integer power of x.)*

CCGPS Math II/Analytic Geometry – Unit 4: Extending the Number System

Sample Daily Lesson Plan

	Day 1	**Day 2**	**Day 3**	
	November 20	November 21	November 22	
	Unit 4: Extending the Number System Introduce Rational Exponents	Introduce Rational Exponents/skills practice	Skills practice/ Rational exponents	
Thanksgiving Break ***November 25 – 29, 2013***				
Day 4	**Day 5**	**Day 6**	**Day 7**	**Day 8**
December 2	December 3	December 4	December 5	December 6
Add & Subtract polynomials	Multiplying polynomials/ applications/word problems	Add, Subtract, Multiply polynomials & Rational exponents Review	Task: Polynomial Patterns	Formative Assessment Lesson www.map.mathshell.org
Day 9	**Day 10**	**Day 11**	**Day 12**	**Day 13**
December 9	December 10	December 11	December 12	December 13
Task: Imagine That/ Introduction to Complex Numbers	Review: Add & Subtract Complex Numbers	Multiply & Divide Complex Numbers	Multiply & Divide Complex Numbers	Assessment
Day 14	**Day 15**	**Day 16**	**Day 17**	**Day 18**
December 16	December 17	December 18	December 19	December 20
Review for Final Exam	Review /Final Exam	Review /Final Exam	Semester Final Exam	

Updated 7/31/2013

HENRY COUNTY SCHOOLS

CCGPS Standards Addressed:
MCC9-12.N.CN.7 MCC9-12.SSE.1-3 MCC9-12..CED.1,2,4 MCC9-12.A.REI.4,7 MCC9-12.F.IF.4-9 MCC9-12 F.BF.1 MCC912.F.BF.3 MCC9-12.S.ID.6

Key Vocabulary
*binomial expression *complex conjugate *complex number *exponential functions *expression *monomial expression *nth roots *polynomial function *rational exponents *rational expression *rational number *standard form of a polygon *trinomial *whole numbers

Unit 5
Quadratic Functions

Essential Question
"How do I analyze, explain, and verify processes of solving, graphing, and comparing quadratic functions, and systems that model real life situations?"

Prerequisite Skills
It is expected that students will have prior knowledge/experience related to the concepts and skills identified below. It may be necessary to pre-assess in order to determine if time needs to be spent on conceptual activities that help students develop a deeper understanding of these ideas.
* Use Function Notation *Put data into tables *Graph data from tables *Solve one variable linear equations *Determine domain of a problem situation *Solve for any variable in a multi-variable equation *Recognize slope of a linear function as a rate of change *Graph linear functions *Complex numbers *Graph inequalities

Suggested Learning Resources/ Performance Tasks

GADOE CCGPS Frameworks
LearnZillion
Henry County Flexbooks
Mathematics Assessment Project (www.map.mathshell.org)

Enduring Understandings

Students will understand…
- The graph of any quadratic function is a vertical and/or horizontal shift of a vertical stretch or shrink of the basic quadratic function $f(x) = x^2$.
- The vertex of a quadratic function provides the maximum or minimum output value of the function and the input at which it occurs.
- Every quadratic equation can be solved using the Quadratic Formula.
- The discriminant of a quadratic equation determines whether the equation has two real roots, one real root, or two complex conjugate roots.
- Quadratic equations can have complex solutions.

Use complex numbers in polynomial identities and equations.
MCC9-12.N.CN.7 Solve quadratic equations with real coefficients that have complex solutions.
Interpret the structure of expressions
MCC9-12.A.SSE.1 Interpret expressions that represent a quantity in terms of its context.★ **MCC9-12.A.SSE.1a** Interpret parts of an expression, such as terms, factors, and coefficients.★ **MCC9-12.A.SSE.1b** Interpret complicated expressions by viewing one or more of their parts as a single entity.★ **MCC9-12.A.SSE.2** Use the structure of an expression to identify ways to rewrite it. (Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)
Write expressions in equivalent forms to solve problems MCC9-12.A.SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. (Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.) **MCC9-12.A.SSE.3a** Factor a quadratic expression to reveal the zeros of the function it defines.★ **MCC9-12.A.SSE.3b** Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.★
Create equations that describe numbers or relationships
MCC9-12.A.CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. **MCC9-12.A.CED.2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ **MCC9-12.A.CED.4** Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
Solve equations and inequalities in one variable MCC9-12.A.REI.4 Solve quadratic equations in one variable. **MCC9-12.A.REI.4a** Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x – p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. **MCC9-12.A.REI.4b** Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.
Solve systems of equations MCC9-12.A.REI.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. Interpret functions that arise in applications in terms of the context. **MCC9-12.F.IF.4** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ **MCC9-12.F.IF.5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.★ **MCC9-12.F.IF.6** Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★
Analyze functions using different representations MCC9-12.F.IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ **MCC9-12.F.IF.7a** Graph linear and quadratic functions and show intercepts, maxima, and minima.★ **MCC9-12.F.IF.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. **MCC9-12.F.IF.8a** Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. **MCC9-12.F.IF.9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
Build a function that models a relationship between two quantities. MCC9-12.F.BF.1 Write a function that describes a relationship between two quantities.★ **MCC9-12.F.BF.1a** Determine an explicit expression, a recursive process, or steps for calculation from a context. **MCC9-12.F.BF.1b** Combine standard function types using arithmetic operations. (Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)
Build new functions from existing functions MCC9-12.F.BF.3 Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)
Construct and compare linear, quadratic, and exponential models and solve problems. MCC9-12.F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.★
Summarize, represent, and interpret data on two categorical and quantitative variables MCC9-12.S.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.★ **MCC9-12.S.ID.6a** Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context.
Emphasize linear, quadratic, and exponential models

CCGPS Math II/Analytic Geometry – Unit 5: Quadratic Functions

Sample Daily Lesson Plan

Professional Learning	**Day 1**	**Day 2**	**Day 3**	**Day 4**
	January 7	January 8	January 9	January 10
	Diagnostic/Introduce Graphing Vertex Form	Graphing Vertex Form (embed transformations) and Characteristics	Practice	Performance-based Assessment
Day 5	**Day 6**	**Day 7**	**Day 8**	**Day 9**
January 13	January 14	January 15	January 16	January 17
Converting Standard to Vertex Form (vice versa)	Review Day 5	Graphing Standard Form using **Parent Graphs revisited Task**	Skills Practice	Performance-based Assessment
MLK Day	**Day 10**	**Day 11**	**Day 12**	**Day 13**
	January 21	January 22	January 23	January 24
	Application problems	Application problems/Quadratic Regression	Quadratic Regression	Formative Assessment Lesson www.map.mathshell.org
Day 14	**Day 15**	**Day 16**	**Day 17**	**Day 18**
January 27	January 28	January 29	January 30	January 31
Greatest Common Factor/Factoring a=1	Factoring when a ≠ 1	Recap factoring and introducing solving by factoring	Practice factoring, solving, and embed graphing for students to see that the intercepts are the solutions	Assessment
Day 19	**Day 20**	**Day 21**	**Day 22**	**Day 23**
February 3	February 4	February 5	February 6	February 7
Intro to solving systems graphing and algebraically simultaneously (one linear and one quadratic)	Students could use this day to work in groups and practice concepts related to solving systems of equaitons.	Review	Review	Mid-Unit Assessment
Day 24	**Day 25**	**Day 26**	**Day 27**	**Day 28**
February 10	February 11	February 12	February 13	February 14
Solve by square roots and begin completing the square using hands-on and/or virtual models	Completing the square through modeling	Review complete the square/Introduce Quadratic Formula	Review Solving by square roots, completing the square, and quadratic formula	Assessment

Winter Break **February 17-21, 2013**				
Day 29	**Day 30**	**Day 31**	**Day 32**	**Day 33**
February 24	February 25	February 26	February 27	February 28
Recap/Intro to solving quadratic inequalities	Solving quadratic inequalities	Solving quadratic inequalities application	Application	Formative Assessment Lesson www.map.mathshell.org
Day 34	**Day 35**	**Day 36**	**Day 37**	**Day 1 (Unit 6)**
March 3	March 4	March 5	March 6	March 7
Review of Quadratic Functions	Review of Quadratic Functions	Performance-based Assessment	Assessment	Begin Unit 6 (Overview)

HENRY COUNTY SCHOOLS

Updated 7/31/2013

Essential Question

"How can I use the coordinate plane and algebraic methods to solve systems that model real life phenomena?"

Unit 6
Modeling Geometry

CCGPS Standards Addressed:
MCC9-12.A.REI.7 MCC9-12.G.GPE.1,2,4

Key Vocabulary

*center of a circle *circle *conic section *diameter *focus of a parabola *general form of a circle *general form a circle *parabola *Pythagorean Theorem *Radius *Standard Form of Circle

Suggested Learning Resources/ Performance Tasks

GADOE CCGPS Frameworks
LearnZillion
Henry County Flexbooks
Mathematics Assessment Project (www.map.mathshell.org)

Enduring Understandings

Students will understand…

- Write and interpret the equation of a circle
- Derive the formula for a circle using the Pythagorean Theorem
- Recognize, write, and interpret equations of parabolas
- Prove properties involving parabolas
- Prove properties involving circles
- Apply algebraic formulas and ideas to geometric figures and definitions
- The intersection of a line and a quadratic figure is the point where the two equations are equal.

Prerequisite Skills

It is expected that students will have prior knowledge/experience related to the concepts and skills identified below. It may be necessary to pre-assess in order to determine if time needs to be spent on conceptual activities that help students develop a deeper understanding of these ideas.

- number sense
- computation with whole numbers and decimals, including application of order of operations
- addition and subtraction of common fractions with like denominators
- applications of the Pythagorean Theorem
- usage of the distance formula, including distance between a point and a line.
- finding a midpoint
- graphing on a coordinate plane
- completing the square
- operations with radicals
- methods of proof

Translate between the geometric description and the equation for a conic section

MCC9-12.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.

MCC9-12.G.GPE.2 Derive the equation of a parabola given a focus and directrix.

Use coordinates to prove simple geometric theorems algebraically

MCC9-12.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).*

MCC9-12.A.REI.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. *For example, find the points of intersection between the line y = –3x and the circle* $x^2 + y^3 = 3$

CCGPS Math II/Analytic Geometry – Unit 6: Modeling Geometry

Sample Daily Lesson Plan

Professional Learning Day [School Closed for Students]	**Day 2**	**Day 3**	**Day 4**	**Day 5**
	March 11	March 12	March 13	March 14
	Converting Standard Form to General Form (factorable) and Complete the Square in a Circle Tasks	Finish yesterday's task and practice converting standard form of a circle to general form of a circle	Application of writing circle equation	Performance-based/task-based assessment
Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
March 17	March 18	March 19	March 20	March 21
Deriving the general equation of a parabola	Practice writing the equation of a parabola given the focus and the directrix	Parabolas in other directions Task	Finish yesterday's task and practice	Formative Assessment Lesson www.map.mathshell.org
Day 11	**Day 12**	**Day 13**	**Day 14**	**Day 15**
March 24	March 25	March 26	March 27	March 28
The intersection of a line and quadratics task (use as notes)	Practice	Review/Application	Review/Application	Formative Assessment Lesson www.map.mathshell.org
Day 16	**Day 17**	**Day 18**	**Day 19**	**Day 1 (Unit 7)**
March 31	April 1	April 2	April 3	April 4
Performance-based activity on quadratics (incorporate graphing calculator activity here)	Algebraic Proof Task	Algebraic Proof Task	Unit Assessment	Unit Assessment
Spring Break April 7-11, 2013				

HENRY COUNTY SCHOOLS

Updated 7/31/2013

Unit 7
Applications of Probablity

Essential Question

"How can I make predictions using theoretical probabilities of compound events?

CCGPS Standards Addressed:
MCC9-12.S.CP.1-7

Key Vocabulary
*addition rule *complement *conditional probability *dependent events *element *independent events *intersection of sets *multiplication rule for independent events *mutually exclusive events *outcome *overlapping events *sample space *set *subset *union of sets *Venn Diagram

Suggested Learning Resources/ Performance Tasks

GADOE CCGPS Frameworks
LearnZillion
Henry County Flexbooks
Mathematics Assessment Project (www.map.mathshell.org)

Enduring Understandings

Students will understand…

- Use set notation as a way to algebraically represent complex networks of events or real world objects.
- Represent everyday occurrences mathematically through the use of unions, intersections, complements and their sets and subsets.
- Use Venn Diagrams to represent the interactions between different sets, events or probabilities.
- Find conditional probabilities by using a formula or a two-way frequency table.
- Understand independence as conditional probabilities where the conditions are irrelevant.
- Analyze games of chance, business decisions, public health issues and a variety of other parts of everyday life can be with probability.
- Model situations involving conditional probability with two-way frequency tables and/or Venn Diagrams.
- Confirm independence of variables by comparing the product of their probabilities

Prerequisite Skills

It is expected that students will have prior knowledge/experience related to the concepts and skills identified below. It may be necessary to pre-assess in order to determine if time needs to be spent on conceptual activities that help students develop a deeper understanding of these ideas.

- Understand the basic nature of probability
- Determine probabilities of simple and compound events
- Organize and model simple situations involving probability
- Read and understand frequency tables

Understand independence and conditional probability and use them to interpret data

MCC9-12.S.CP.1 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). ★

MCC9-12.S.CP.2 Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. ★

MCC9-12.S.CP.3 Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B. ★

MCC9-12.S.CP.4 Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. ★

MCC9-12.S.CP.5 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. ★

Use the rules of probability to compute probabilities of compound events in a uniform probability model

MCC9-12.S.CP.6 Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model. ★

MCC9-12.S.CP.7 Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model. ★

RELATED STANDARDS

Investigate chance processes and develop, use, and evaluate probability models.

MCC7.SP.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

MCC7.SP.8a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

MCC7.SP.8b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.

CCGPS Math II/Analytic Geometry – Unit 7: Applications of Probablity

Sample Daily Lesson Plan

Day 2	**Day 3**	**Day 4**	**Day 5**	**Day 6**
April 14	April 15	April 16	April 17	April 18
Overview of Probability	How Odd GaDOE Frameworks Task Review of Venn Diagrams, set notation and the addition rule	Review How Odd GADOE Task (Review of Venn Diagrams, set notation and the addition rule)	The Conditions are Right Learning Task [Partner/Small Group Task] Discuss Conditional probability and frequency tables	Administer Formative Assessment Lesson (Modeling Conditional Probabilities 1: Lucky Dip) www.map.mathshell.org
Day 7	**Day 8**	**Day 9**	**Day 10**	**Day 11**
April 21	April 22	April 23	April 24	April 25
The Land of Independence Performance Task Individual/Partner/ Small Group Task Independence	Medical Testing Formative Assessment LessonImplement a strategy to solve conditional probabilities.	False Positives Achieve CCSS- CTE Classroom Tasks Exploring conditional probability using a variety of methods.	Culminating Performance Task Are You Positive? Assessment over Conditional probability and frequency tables, independence, addition rule	Culminating Performance Task Are You Positive? Assessment over Conditional probability and frequency tables, independence, addition rule
Day 12	**Day 13**	**Day 14**	**Day 15**	**Day 16**
April 28	April 29	April 30	May 1	May 2
Assessment over Unit 7 - Probability	EOCT REVIEW	EOCT REVIEW	EOCT REVIEW	EOCT REVIEW
Day 17	**Day 18**	**Day 19**	**Day 20**	**Day 21**
May 5	May 6	May 7	May 8	May 9
EOCT Review	**EOCT (Math) STATE TESTING DAY**	Begin Final Exam Project	Final Exam Project	Final Exam Project
Day 22	**Day 23**	**Day 24**	**Day 25**	**Day 26**
May 12	May 13	May 14	May 15	May 16
	Final Exam Project	Final Exam Project	Final Exam Project	Final Exam Project
Day 27	**Day 28**	**Day 28**	**Day 29**	**Day 30**
May 19	**May 20**	**May 21**	**May 22**	**May 23**
	Final Exam Project Presentations	Final Exam Project Presentations	Final Exam Project Presentations	**Last Day of School** Final Exam Project Presentations