COURSE: Geometry Honors

GRADE LEVEL: Ninth, Tenth, Eleventh, Twelfth Grades

LENGTH OF COURSE: 90 days

TEXT: Prentice Hall Mathematics Geometry

PUBLISHER: Prentice Hall Mathematics

COPYRIGHT: 2004

COURSE DESCRIPTION:

Geometry Honors is a course recommended for the college-bound student. It places emphasis on proof, the need for clarity and precision of the language, and geometric visualization. A unit on formulas for plane and solid figures is included.

Geometry Honors follows the same general course of study as Geometry but includes more difficult examples on most topics and is graded at a more challenging level. It often includes optional topics not generally covered in the regular course. Special projects are frequently included.

CURRICULUM WRITING TEAM:

Mary Gilson
Lynn Cunningham
Mel Vogler

DATE OF REVISION:

2006

Course: Geometry Honors

Unit: Tools of Geometry

Grade Level: 9, 10, 11, 12

PA Standards: 2.1.11.A
2.2.11.B
2.2.11.E
2.3.11.A
2.3.11.B
2.3.11.C
2.5.11.A
2.5.11.B
2.5.11.C
2.5.11.D
2.8.11.A
2.8.11.J
2.8.11.N
2.9.11.G
2.9.11.I

Topics:	**Skills:**
Patterns and Inductive Reasoning Points, Lines, and Planes Segments, Rays, Parallel Lines, and Planes Basic Constructions (optional) The Coordinate Plane Perimeter, Circumference, and Area	Develop and implement critical thinking skills using inductive reasoning Analyze patterns to form a conjecture Comprehend and implement new geometric terms Understand basic postulates of geometry Identify segments and rays Recognize parallel lines Calculate the lengths of segments on a number line and coordinate plane Find the measures of angles Use a compass and straightedge to construct congruent segments, angles, perpendicular bisectors and angle bisectors Calculate the midpoint of a segment in the coordinate plane Find the perimeter of rectangles and squares, and circumferences of circles Calculate the area of rectangles, squares and circles
Activities:	**Performance Assessments:**
Textbook problem solving Worksheets Partner work/ Cooperative learning Board work Utilization of the scientific calculator	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework

Course: Geometry Honors

Grade Level: 9, 10, 11, 12

Unit: Reasoning and Proof

PA Standards: 2.1.11.A
2.4.11.A
2.4.11.B
2.4.11.C
2.5.11.B
2.5.11.C
2.5.11.D
2.8.11.N
2.9.11.G
2.9.11.I

Topics:	**Skills:**
Conditional Statements Biconditionals and Definitions Deductive Reasoning Reasoning in Algebra Proving Angles Congruent	Develop and implement critical thinking skills using deductive reasoning Comprehend and implement new geometric terms Recognize conditional statements Write converse of conditional statements Write biconditional statements Evaluate and recognize good definitions Use the Law of Detachment and the Law of Syllogism in various situations Connect reasoning in algebra and geometry to justify steps in a logical argument Identify angle pairs Prove and apply theorems about angles
Activities:	**Performance Assessments:**
Textbook problem solving Worksheets Partner work/ Cooperative learning Board work Utilization of the scientific calculator	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework

Course: Geometry Honors

Grade Level: 9, 10, 11, 12

Unit: Parallel and Perpendicular Lines

PA Standards: 2.1.11.A
2.2.11.A
2.4.11.A
2.5.11.B
2.5.11.c
2.5.11.A
2.5.11.B
2.8.11.K
2.8.11.L
2.8.11.N
2.9.11.G
2.9.11.I

Topics:	**Skills:**
Properties of Parallel Lines Proving Lines are Parallel Lines in the Coordinate Plane Slopes of Parallel and Perpendicular Lines Constructing Parallel and Perpendicular Lines (Optional)	Develop and implement critical thinking skills Comprehend and implement new geometric terms Identify angles formed by two lines and a transversal Solve algebraic problems that use properties of parallel lines Use a transversal in proving lines parallel Relate parallel and perpendicular lines Compare slopes of parallel and perpendicular lines Write an equation of a line parallel/ perpendicular to another line through a given point Determine the solution(s) of systems of linear equations
Activities:	**Performance Assessments:**
Textbook problem solving Worksheets Partner work/ Cooperative learning Board work Utilization of the scientific calculator	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework

Course: Geometry Honors

Grade Level: 9, 10, 11, 12

Unit: Congruent Triangles

PA Standards: 2.1.11.A
2.2.11.A
2.5.11.B
2.5.11.C
2.8.11.N
2.9.11.A
2.9.11.B
2.9.11.D
2.9.11.G
2.9.11.I

Topics:	**Skills:**
Parallel Lines and the Triangle Sum Theorem Congruent Figures Triangle Congruence by SSS and SAS Triangle Congruence by ASA and AAS Using Congruent Triangles: CPCTC Isosceles and Equilateral Triangles Using Corresponding Parts of Congruent Triangles	Classify triangles by sides and angles Find the measures of the angles of a triangle Use the Exterior Angle Theorem to solve for angles in a triangle Recognize congruent figures and their corresponding parts Show/prove triangles are congruent by SSS, SAS, AAS, ASA or HL Use triangle congruence and CPCTC to prove that parts of two triangles are congruent Apply properties of isosceles and equilateral triangles to solve angles or sides of a triangle
Activities:	**Performance Assessments:**
Textbook problem solving Worksheets Partner work/ Cooperative learning Board work Utilization of the scientific calculator	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework

Course: Geometry Honors

Grade Level: 9, 10, 11, 12

Unit: Relationships within Triangles

PA Standards: 2.1.11.A
2.5.11.A
2.5.11.B
2.5.11.C
2.5.11.D
2.8.11.G
2.9.11.E
2.9.11.G
2.9.11.I
2.9.11.J

Topics:	**Skills:**
Midsegments of Triangles Bisectors of Triangles Concurrent Lines, Medians, and Altitudes Inverses, Contrapositives, and Indirect Reasoning Inequalities in Triangles ** Independent Construction Project	Construct altitudes, medians, angle bisectors and perpendicular bisectors Use properties of midsegments to solve problems Use and identify properties of perpendicular and angles bisectors to solve geometric problems Identify properties of medians and altitudes of a triangle Examine points of concurrency and their uses Write the negation, inverse and contrapositive of a conditional statement Utilize indirect reasoning to solve geometric problems Use inequalities involving angles of triangles Use inequalities involving sides of triangles
Activities:	**Performance Assessments:**
Textbook problem solving Worksheets Partner work/ Cooperative learning Board work Utilization of the scientific calculator	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework ** Independent Construction Project or teacher approved project (optional)

Course: Geometry Honors

Unit: Quadrilaterals

Grade Level: 9, 10, 11, 12

PA Standards: 2.1.11.A
2.2.11.A
2.2.11.C
2.2.11.D
2.2.11.E
2.4.11.A
2.4.11.B
2.4.11.C
2.5.11.A
2.5.11.B
2.5.11.C
2.5.11.D
2.8.11.G
2.8.11.H
2.8.11.J
2.8.11.K
2.8.11.L
2.8.11.N
2.9.11.B
2.9.11.C
2.9.11.D
2.9.11.G
2.9.11.I

Topics:	**Skills:**
Classification of Quadrilaterals Properties of Parallelograms Proving that Quadrilateral is a Parallelogram Special Parallelograms Kites and Trapezoids Figures in the Coordinate Plane Proofs Using Coordinate Geometry (Optional)	Develop and implement critical thinking skills Classify polygons Calculate the sums of the measures of the interior ad exterior angles of polygons Define and classify special types of quadrilaterals Apply relationships among sides and among angles of parallelograms Use relationships involving diagonals of parallelograms or transversals. Determine whether a quadrilateral is a parallelogram Identify and apply properties of rhombuses and rectangles, squares, kites and trapezoids

Activities:	**Performance Assessments:**
Textbook problem solving Worksheets Partner work/ Cooperative learning Board work Utilization of the scientific calculator	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework

Course: Geometry Honors

Grade Level: 9, 10, 11, 12

Unit: Similarity

PA Standards: 2.1.11.A
2.2.11.A
2.5.11.A
2.5.11.B
2.5.11.C
2.5.11.D
2.8.11.N
2.9.11.B
2.9.11.G
2.9.11.I

Topics:	**Skills:**
Ratios and Proportions Similar Polygons Proving Triangles Similar Proportions in Triangles Perimeters and Areas of Similar Figures	Develop and implement critical thinking skills Comprehend and implement new geometric terms Write ratios and solve proportions Identify and apply similar polygons Use AA, SAS, and SSS similarity statements Apply AA, SAS, and SSS similarity statements to show triangles are similar Use the Side-Splitter Theorem Use the Triangle-Angle-Bisector Theorem Find the perimeters and areas of similar figures
Activities:	**Performance Assessments:**
Textbook problem solving Worksheets Partner work/ Cooperative learning Board work Utilization of the scientific calculator	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework

Course: Geometry Honors

Grade Level: 9, 10, 11, 12

Unit: Right Triangle Geometry

PA Standards: 2.1.11.A
2.2.11.A
2.2.11.C
2.5.11.A
2.5.11.B
2.5.11.C
2.5.11.D
2.9.11.B
2.10.11.B

Topics:	**Skills:**
The Pythagorean Theorem and Its Converse Special Right Triangles Similarity in Right Triangles The Tangent Ratio Sine and Cosine Ratios Angles of Elevation and Depression Vectors (Optional) Trigonometry and Area (Optional)	Develop and implement critical thinking skills Comprehend and implement new geometric terms Use Pythagorean Theorem to solve sides of a right triangle Use the Pythagorean Theorem Converse to determine if a triangle is right, acute or obtuse Use the properties of 45-45-90 triangles to solve the lengths of the sides of a right triangle Use the properties of 30-60-90 triangles the lengths of the sides of a right triangle Find and use relationships in similar right triangles Use tangent ratios to determine side lengths in triangles Use sine and cosine to determine side lengths in triangles Apply tangent, cosine or sine ratios to calculate the measure of the acute angles of a triangle Use angles of elevation and depression to solve problems Describe various vectors (optional) Solve problems that involve vector addition (optional) Find the area of regular polygons using trigonometry (optional) Find the area of a triangle using trigonometry (optional)

Activities:	**Performance Assessments:**
Textbook problem solving Worksheets Partner work/ Cooperative learning Board work Utilization of the scientific calculator	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework

Course: Geometry Honors

Unit: Area

Grade Level: 9, 10, 11, 12

PA Standards: 2.1.11.A
2.2.11.A
2.5.11.A
2.5.11.B
2.5.11.C
2.5.11.D
2.7.11.A
2.8.11.N
2.9.11.F
2.9.11.G
2.9.11.I
2.10.11.B

Topics:	**Skills:**
Area of Parallelograms and Triangles Area of Trapezoids, Rhombuses, and Kites Circles and Arcs Area of Circles and Sectors Geometric Probability Area of Regular Polygons (Optional)	Develop and implement critical thinking skills Comprehend and implement new geometric terms Calculate the area of a parallelogram, triangle, trapezoid, Rhombuses and Kites Apply knowledge from previous chapters to calculate the area of parallelograms, triangles, trapezoids, rhombuses and kites Find the measures of central angles and their arcs Calculate the circumference and arc length of a circle Calculate the area of circles, sectors and segments of circles Use segments and area models to find the probabilities of events Find the area of regular polygons (optional)
Activities:	**Performance Assessments:**
Textbook problem solving Worksheets Partner work/ Cooperative learning Board work Utilization of the scientific calculator	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework

Course: Geometry Honors

Grade Level: 9, 10, 11, 12

Unit: Circles

PA Standards: 2.1.11.A
2.2.11.A
2.5.11.A
2.5.11.B
2.5.11.C
2.5.11.D
2.8.11.N
2.9.11.E
2.9.11.F
2.9.11.G
2.9.11.I
2.10.11.B

Topics:	**Skills:**
Tangent Lines Chords and Arcs Inscribed Angles Angle Measures and Segment Lengths Circles in the Coordinate Plane (Optional) Locus: A Set of Points (Optional)	Develop and implement critical thinking skills Comprehend and implement new geometric terms Use the relationship between a radius and a tangent Use the relationship between two tangent from one point Use congruent chards, arcs, and central angles Recognize properties of lines through the center of a circle Find the measure of an inscribed angle Calculate the measure of an angle formed by a tangent and a chord Determine the measures of angles formed by chords, secants, and tangents Find the lengths of segments associated with circles Write an equation of a circle (optional) Find the center and radius of a circle (optional) Draw and describe a locus (optional)
Activities:	**Performance Assessments:**
Textbook problem solving Worksheets Partner work/ Cooperative learning Board work Utilization of the scientific calculator	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework