

BERKELEY HEIGHTS PUBLIC SCHOOLS
BERKELEY HEIGHTS, NEW JERSEY

**GOVERNOR LIVINGSTON HIGH SCHOOL
MATHEMATICS DEPARTMENT**

GEOMETRY
#0307, 0311, 0312

Curriculum Guide

October 2005

Mrs. Judith A. Rattner, Superintendent
Mr. Matthew Jennings, Assistant Superintendent
Mr. Vincent Parisi, District Supervisor

Developed by: Steven Hess
Kristen Irlbeck
Barbara Montano

This curriculum may be modified through varying techniques,
strategies, and materials, as per an individual student's
Individualized Educational Plan (IEP).

Approved by the Berkeley Heights Board of Education
at the regular meeting held on 10/20/2005.

TABLE OF CONTENTS

	Page
Philosophy and Rationale.....	1
Course Proficiencies.....	2
Course Objectives	2
Student Proficiencies	5
Methods of Evaluation.....	9
Course Outline/Student Objectives	10
Targets for Content Coverage	17
Key Algebra Topics for Review	19
Resources/Activities Guide.....	20
Suggested Audio Visual/Computer Aids.....	21

PHILOSOPHY/RATIONALE

Geometry is the branch of mathematics dealing with spatial relationships. These relationships are carefully defined in terms of points, lines, and planes and these definitions and other properties are used to build logical conclusions. Geometry emphasizes connections between mathematics and real-life situations and activities. The study of geometry promotes student communication, critical thinking, and problem-solving through refinement and extension of mathematical processes. In this course, students gain an appreciation for the precision of mathematical language and will develop and extend logical thinking skills through the use of formal proofs and analytical problem-solving. The student will also learn to use mathematical language to communicate ideas through the use of models, diagrams, and symbols.

Geometry includes the undefined terms, basic definitions, postulates, and theorems of geometry. Topics include angles, parallel and perpendicular lines, congruent triangles, applications of congruent triangles, similar polygons, right triangles, circles, areas of polygons and circles, surface areas and volumes of solids, the coordinate plane, the distance and midpoint formulas, the slope of a line, and mathematical modeling. Transformations, which include reflections, translations, rotations and symmetry, are included in the course. Throughout, students are asked to apply geometric facts and reasoning to problem-solving.

Geometry is a full year, five credit course designed for college bound students and is offered at three levels: Honors Geometry, Geometry, and Geometry Concepts. The prerequisite for each is the successful completion of Algebra 1. The course is designed to reinforce and build upon the student's foundation from Algebra 1, while further developing the student's ability to solve problems and think critically. The Honors section is designed for students with high mathematical ability, the prerequisite being a B+ average in 7th or 8th grade Algebra I or an A average in 9th grade Algebra 1 and a teacher recommendation. The Concepts section places less emphasis on proofs and is designed for students who require more practice with fundamental concepts. New Jersey's Core Curriculum Content Standards are integrated throughout the curriculum.

COURSE PROFICIENCIES

COURSE OBJECTIVES

1. To use precise language to define the basic elements of geometry (points, lines, planes, segments, rays, and angles) and to produce careful sketches of these elements which illustrate their properties.

4.2/12A1

4.5/12B4

C6

E1-3

2. To use the ruler and addition postulates to measure, add, divide, and bisect segments and angles, and to identify and understand the relationships between vertical, supplementary, complementary, and adjacent pairs of angles.

4.2/12C1

4.5/12A3-5

D2

B4

E2

C6

E1-3

3. To develop deductive reasoning by using algebraic properties and the properties of segments and angles, and to write two-column proofs of segment and angle relationships.

4.1/12A3

4.5/12A1-5

4.2/12A1,4

B1-4

C1-4

D1-6

E1-3

4. To understand the properties of, and angles formed by, perpendicular lines and parallel lines cut by a transversal; to calculate and use slope to deduce the relationship of several lines and their angles.

4.2/12A1,3,4

4.5/12A1-5

9.2/12A1,3

C1

B1-4

C1-4

D1-6

E1-3

F1-4

5. To prove triangles are congruent using SSS, SAS, ASA, and AAS, given information about their sides and angles; to use properties of right, isosceles and equilateral triangles, and to use geometric figures in a coordinate plane.

4.2/12A1-4

4.5/12A1,3

8.1/12A3

B1,2

9.2/12A3

D1-4

C4

E1

F1,5
COURSE PROFICIENCIES (continued)

6. To use properties of special lines and segments related to triangles, including midsegments, bisectors, medians and altitudes; to compare side lengths and angle measures in one or more triangles and apply the Triangle Inequality Theorem.
- | | | |
|------------|------------|----------|
| 4.2/12A1-4 | 4.5/12B1,2 | 8.1/12A3 |
| E1 | C4 | B11 |
| | D1-4 | 9.2/12A3 |
| | E1 | |
| | F1,5 | |
7. To classify special quadrilaterals and create a table linking the specific properties to each type of quadrilateral; to write proofs about special quadrilaterals, and to find areas of triangles and quadrilaterals.
- | | | |
|------------|------------|----------|
| 4.2/12A1,3 | 4.5/12E1,2 | 9.2/12A3 |
| E2 | F1,5 | |
| 4.3/12B3 | | |
8. To describe motion of geometric figures in a plane as reflection, rotation, translation, glide reflection, or a composition of motions; to describe translations using vectors.
- | | | |
|------------|------------|------------|
| 4.2/12A1,3 | 4.5/12E1,2 | 9.2/12A1,3 |
| B1,3,4 | F1,5 | |
| C2 | | |
| 4.3/12B3 | | |
9. To use ratio and proportion to determine if two polygons are similar, and to develop multiple methods of proving that two triangles are similar; to use proportionality theorems to calculate segment lengths of similar triangles, and to use these skills to solve a variety of real-life applications and to report results accurately using the concept of significant digits.
- | | | |
|--------------|------------|------------|
| 4.2/12A1,3,4 | 4.5/12A1-5 | 8.1/12B11 |
| D1 | B1-4 | 8.2/12B3,4 |
| E1 | D1-6 | 9.2/12A1,3 |
| | E1-3 | |
| | F1,4,5 | |
10. To explore and use the properties related to general right triangles, similar right triangles, and special right triangles.
- | | | |
|--------------|------------|----------|
| 4.1/12C1 | 4.5/12A1,3 | 9.2/12C2 |
| 4.2/12A1,3,4 | B2 | |
| D1,2 | C4,6 | |
| E1 | F4 | |

COURSE PROFICIENCIES (continued)

11. To investigate applications of right triangles, including trigonometry, or triangle measurement, and vectors.
- | | | |
|------------|------------|----------|
| 4.1/12C1 | 4.5/12A1,3 | 9.1/12B5 |
| 4.2/12A1,4 | B2 | |
| C2 | C4,6 | |
| E1 | F4 | |
12. To identify and create self-similar fractal images through iteration, and to find patterns in the area and perimeter of these images.
- | | | |
|------------|------------|--|
| 4.2/12B4 | 4.5/12A1,3 | |
| 4.3/12A1,3 | | |
13. To investigate and calculate the measures of arcs and angles in a circle and the lengths of arcs and segments in a circle; to use arcs, angles, and segments in circles to solve real-life problems; and to find the equation of a circle.
- | | | |
|--------------|------------|----------|
| 4.2/12A1,3,4 | 4.5/12A1,3 | 9.2/12C2 |
| | B2 | |
| | C4,6 | |
| | F4 | |
14. To discover relationships between angles, arc length, chords and points of tangency in a circle, to use coordinate geometry to measure and define circles, and to solve related application problems involving circles.
- | | | |
|------------|----------|--|
| 4.2/12A1,4 | 4.5/12D2 | |
| E1,2 | | |
15. To synthesize knowledge of circles and polygons; to find the measure of interior and exterior angles and the area of regular polygons and circles; and to estimate and compare perimeters and areas of similar figures.
- | | | |
|------------|----------|--|
| 4.2/12A1,4 | 4.5/12D2 | |
| E1,2 | | |
16. To recognize the relationship between polyhedra and 2D figures; to estimate and calculate the surface area and volume of prisms, pyramids, cylinders, cones, and spheres; and to use these figures to solve a variety of real-life problems.
- | | | |
|--------------|----------|----------|
| 4.2/12A1,2,4 | 4.5/12D2 | 8.1/12B9 |
| B2 | | 9.2/12C2 |
| E1,2 | | |

STUDENT PROFICIENCIES

The student will be able to:

1. Predict the next number in a sequence by finding a pattern. (4.5/12A1,4,5, C1, D2,4-6; 8.1/12B11)
2. Formulate conjectures based on inductive reasoning. (4.5/12D2,4-6)
3. Identify and sketch models of points, lines, and planes and identify collinear and coplanar points. (4.2/12A1; 4.5/12B4)
4. Calculate the distance between two points in a coordinate plane using the distance formula. (4.2/12C1)
5. Identify and use congruent segments and find the midpoint of a segment in order to identify a segment bisector. (4.2/12C1, D2)
6. Use the angle addition postulate to find the measures of angles. (4.2/12A1)
7. Identify and use adjacent angles, vertical angles, complementary angles, supplementary angles and linear pairs of angles. (4.2/12A1)
8. Solve unfamiliar problems by using a systematic, logical approach. (4.5/12D2,4-6; 8.1/12B11)
9. Analyze conditional statements and write their converses, and identify biconditional statements. (4.5/12B1-4)
10. Write the inverses and contrapositives of conditional statements. (**Honors**) (4.5/12B1-4)
11. Construct a counterexample to prove a logical statement is false and present and defend this counterexample through class discussion. (4.2/12A4; 4.5/12B1-4, D1-5)
12. Complete proofs involving algebraic properties of equality, segment theorems, and angle theorems. (4.2/12A4; 4.5/12D1-6)
13. Identify the relationships among pairs of angles formed by pairs of lines and a transversal and use these relationships to determine the measures of angles. (4.2/12A3)
14. Recognize angle conditions that produce parallel lines, and prove two lines parallel based on given angle relationships. (4.2/12A3,4)
15. Deduce whether two lines are parallel or perpendicular by calculating and comparing their slopes. (4.2/12A4, C1)
16. Classify triangles by their sides and angles. (4.2/12A2; 4.5/12B1,2, E1)
17. Find angle measures in triangles. (4.2/12A2; 4.5/12B1,2, E1)

18. Identify congruent figures and corresponding parts. (4.2/12A3,4; 4.5/12A1,3)

STUDENT PROFICIENCIES (continued)

19. Test for triangle congruence using SAS, SSS, ASA, and AAS postulates.(4.2/12A3,4; 4.5/12A4,5, B2,3,5, D1-4)
20. Use congruent triangle postulates and theorems to plan and write proofs. (4.2/12A1,3,4, E1-2; 4.5/12A4,5, B2,3,5, D1-4)
21. Apply properties of isosceles, right and equilateral triangles. (4.2/12A1,3,4, E1-2; 4.5/12A4-5, B2,3,5, D1-4)
22. Prove triangles are congruent using coordinate geometry. (4.2/12A3,4; 4.5/12 C1,2, E1, F1,5)
23. Draw and apply properties of perpendicular bisectors and angle bisectors to triangles. (4.2/12A3-4; 4.5/12F1,2,5)
24. Draw and apply properties of medians and altitudes of triangles. (4.2/12A3,4; 4.5/12 F1,2,5)
25. Compare the lengths of the sides or the measures of the angles of triangles. (4.2/12A3, E1; 4.5/12A1, D4)
26. Identify polygons and special types of quadrilaterals, and make a table linking identifying properties to each specific shape. (4.2/12A1,3; 4.5/12A1-2, C1, D2, E1)
27. Find areas of special quadrilaterals. (4.2/12E2; 4.5/12E1, F1,5)
28. Apply sum of measures of interior angles to find measures of angles of quadrilaterals. (4.2/12A3; 4.5/12A1,3, C2, E1, F1,5)
29. Distinguish between reflection, rotation, translation, and dilation using properties of each motion. (4.2/12A1,3, B1; 4.5/12E1-2, F1,5)
30. Represent motion in the coordinate plane using vectors. (4.2/12C2; 4.5/12E1-2, F1,2)
31. Determine whether two or more given shapes can be used to generate a tessellation. (4.2/12B3-4; 4.5/12E1-2, F1,5)
32. Employ reciprocal and cross product properties to solve problems of ratio and proportion. (4.3/12D2; 4.5/12C4, F4)
33. Calculate the geometric mean between a pair of numbers. (4.3/12D2; 4.5/12F4)
34. Identify similar polygons and triangles. (4.2/12E1)
35. Justify that two triangles are similar by AA Similarity Postulate, SSS and SAS Similarity theorems. (4.2/12E1)

36. Use similar triangles and proportionality theorems to solve real-life problems and use concept of significant digits to report results with appropriate accuracy. (4.2/12D1, E1; 4.5/12C4; 8.1/12B11; 9.2/12A1,3)

STUDENT PROFICIENCIES (continued)

37. Solve problems involving similar right triangles formed by the altitude drawn to the hypotenuse of a right triangle. (4.2/12A3; 4.3/12D2)
38. Use the Pythagorean Theorem and its converse to solve problems. (4.2/12A1; 4.2/12E1; 4.3/12D2; 4.5/12C3-4, F4)
39. Determine the side lengths of special right triangles. (4.2/12A1, E1)
40. Express trigonometric ratios of an acute angle and use these ratios to solve right triangle problems occurring in real-life applications. (4.2/12A1, D1, E1)
41. Determine the magnitude and direction of a vector and calculate the sum of two vectors. (4.2/12C2)
43. Recognize and create self-similar fractal images through iteration, and deduce patterns to calculate the area and perimeter of these images as a function of the number of iterations. (4.2/12B4; 4.3/12A1,3; 4.5/12A1,3)
44. Identify segments and lines related to circles. (4.2/12A3)
45. Use the properties of tangents of circles, arcs, chords, inscribed angles and inscribed polygons of circles. (4.2/12A1,3; 4.5/12F1,5)
46. Identify and use angles formed by tangents, chords, and secants, and find the lengths of segments of tangents, chords, and lines that intersect a circle. (4.2/12A1,3; 4.3/12D2, 4.5/12D1-2, F1,5)
47. Derive and graph the equation of a circle. (4.2/12A1)
48. Find the measures of the interior and exterior angles of polygons, the circumference of a circle, and the length of an arc of a circle. (4.2/12A3)
49. Calculate the areas of regular polygons, circles and sectors. (4.2/12E2)
50. Compare perimeters and areas of similar figures; and compare the surface area and volume of similar solids. (4.2/12E2)
51. Incorporate area formulas to derive geometric probabilities and solve related problems. (4.4/12B2)
52. Draw perspective views of 3D objects on isometric dot paper and discover the relationship between 2D figures such as an isosceles triangle and 3D figures such as a cone (achieved through rotation about the altitude). (4.2/12A2, B2; 8.2/12B4)

53. Use estimation and then carefully calculate the surface area and volume of prisms, cylinders, pyramids, cones, and spheres. (4.2/12A2, E2)
54. Estimate and calculate the surface area and volume of similar solids (**Honors**). (4.2/12 E2)

METHODS OF EVALUATION

1. Homework and class work.
2. Class participation.
3. Tests and quizzes.
4. Projects.
5. Notebooks .
6. Cooperative learning assignments.
7. Mid-term and final examinations.

SCOPE AND SEQUENCE
COURSE OUTLINE/STUDENT OBJECTIVES

Topics in brackets throughout the scope and sequence should be omitted from the “Geometry Concepts” course requirements

Topics covered only in Honors are noted as such: (Honors)

The student will be able to:

N. J. Core Curriculum Standards/ Grades	Strands & Indicators	Course Outline/Student Objectives
4.2/9,10,11,12 4.5/9,10,11,12 8.1/9,10,11,12	<p style="text-align: center;">A1</p> C1 D2 E2 A3-5 B4 C6 E1-3 B11	I. The Language Of Geometry <ul style="list-style-type: none"> A. Patterns and Inductive Reasoning <ul style="list-style-type: none"> 1. Find and describe patterns 2. Formulate real-life conjectures based on inductive reasoning B. Points, Lines, and Planes <ul style="list-style-type: none"> 1. Understand and use both undefined and defined terms 2. Sketch intersections of lines and planes C. Segments and Their Measures <ul style="list-style-type: none"> 1. Use ruler and segment addition postulates 2. Calculate distances in the coordinate plane using distance formula D. Angles and Their Measures <ul style="list-style-type: none"> 1. Use the angle addition postulate to find the degree measure of angles 2. Classify angles as acute, obtuse, right, or straight E. Segments and Angle Bisectors <ul style="list-style-type: none"> 1. Construct segment and angle bisectors 2. Use the midpoint formula to find the coordinates of a midpoint and identify segment bisectors F. Angle Pair Relationships <ul style="list-style-type: none"> 1. Identify and use vertical and adjacent angles and linear pairs 2. Identify and use complementary and supplementary angles

		<p>G. Perimeter, Circumference, and Area</p> <ol style="list-style-type: none"> 1. Find the perimeter and area of common plane areas 2. Use a problem-solving plan to logically approach unfamiliar problems
<p>4.1/9,10,11,12 4.2/9,10,11,12 4.5/9,10,11,12</p>	<p>A3 A1,4 A1-5</p>	<p>II. Reasoning And Introduction To Proof</p> <p>A. Conditional Statements</p> <ol style="list-style-type: none"> 1. Recognize and analyze a conditional statement

	B1-4 C1-4 D1-6 E1-3	<p>II. Reasoning And Introduction To Proof (continued)</p> <p>2. Use conditional statements to write postulates about points, lines, and planes</p> <p>B. Definitions and Biconditional Statements</p> <p>1. Use definitions to express spatial ideas precisely</p> <p>2. Recognize and use biconditional statements</p> <p>C. Deductive Reasoning</p> <p>1. Form conclusions by applying the laws of logic to true statements and analyze through discussion</p> <p>2. Construct a counterexample to prove a logical statement is false and describe to peers</p> <p>D. Reasoning with Properties from Algebra</p> <p>1. Identify and use algebraic properties of equality in proofs</p> <p>2. Use properties of length and measure to solve real-life problems</p> <p>E. Proving Statements about Segments</p> <p>1. Justify statements about congruent segments</p> <p>2. Write reasons for steps in a proof using segment postulates</p> <p>F. Proving Statements about Angles</p> <p>1. Use angle congruence properties</p> <p>2. Prove properties about special pairs of angles</p>
4.2/9,10,11,12 4.5/9,10,11,12 9.2/9,10,11,12	A1,3,4 C1 A1-5 B1-4 C1-4 D1-6 E1-3 F4,5 A1,3	<p>III. Perpendicular And Parallel Lines</p> <p>A. Lines and Angles</p> <p>1. Identify relationships between lines</p> <p>2. Identify angles formed by transversals</p> <p>B. Prove Results about Perpendicular Lines</p> <p>C. Parallel Lines and Transversals</p> <p>1. Identify the relationships among pairs of angles formed by parallel lines and a transversal</p> <p>2. Use properties of parallel lines to solve applications problems</p> <p>D. Proving Lines are Parallel</p> <p>1. Prove two lines are parallel based on their angle relationships</p> <p>E. Lines in the Coordinate Plane</p> <p>1. Find slopes of lines and use slope to identify parallel lines in a coordinate plane</p> <p>2. Use slope to identify perpendicular lines in a coordinate plane</p>
4.2/9,10,11,12 4.5/9,10,11,12	A1,3,4 A1,3 B1,2 C1,2,4	<p>IV. Congruent Triangles</p> <p>A. Triangles and Angles</p> <p>1. Classify triangles by their sides and angles</p> <p>2. Find angle measures in triangles</p>

9.2/9,10,11,12	D1,2,3,4 E1 F1,2,5 A3	<p>IV. Congruent Triangles (continued)</p> <p>B. Congruence and Triangles</p> <ol style="list-style-type: none"> 1. Identify congruent figures and corresponding parts 2. Prove that two triangles are congruent <p>C. Proving Triangles are Congruent</p> <ol style="list-style-type: none"> 1. Prove that triangles are congruent using SSS, SAS, ASA, and AAS 2. Use congruence postulates in real-life problems <p>D. [Using Congruent Triangles]</p> <ol style="list-style-type: none"> 1. Use congruent triangles to plan and write proofs 2. Use congruent triangles to prove constructions are valid. <p>E. Isosceles, Equilateral, and Right Triangles</p> <ol style="list-style-type: none"> 1. Use properties of isosceles and equilateral triangles 2. Use properties of right triangles <p>F. [Triangles and Coordinate Proof]</p> <ol style="list-style-type: none"> 1. Place geometric figures in a coordinate plane 2. Write a coordinate proof
<p>4.2/9,10,11,12</p> <p>4.5/9,10,11,12</p> <p>8.1/9,10,11,12</p> <p>9.2/9,10,11,12</p>	<p>A1,3,4 E1 B1,2 C4 D1,2,3,4 E1 F1,5 A3 B11 A3</p>	<p>V. Properties Of Triangles</p> <p>A. Perpendiculars and Bisectors</p> <ol style="list-style-type: none"> 1. Use properties of perpendicular bisectors 2. Use properties of angle bisectors <p>B. Bisectors, Medians, and Altitudes of a Triangle</p> <ol style="list-style-type: none"> 1. Use properties of perpendicular bisectors of a triangle 2. Use properties of medians and altitudes of a triangle <p>C. Midsegment Theorem</p> <ol style="list-style-type: none"> 1. Identify the midsegments of a triangle 2. Use properties of midsegments of a triangle <p>D. Inequalities in One Triangle</p> <ol style="list-style-type: none"> 1. Find longest sides and largest angles of triangle 2. Use the <i>Triangle Inequality</i> <p>E. Indirect Proof and Inequalities in Two Triangles (Honors)</p> <ol style="list-style-type: none"> 1. Read and write an indirect proof 2. Compare side lengths and angle measures
<p>4.2/9,10,11,12</p> <p>4.5/9,10,11,12</p> <p>9.2/9,10,11,12</p>	<p>A1,3 E2 A B C1,2,6 D E F1,5 A3</p>	<p>VI. Quadrilaterals</p> <p>A. Polygons</p> <ol style="list-style-type: none"> 1. Identify, name, and describe polygons 2. Use the sum of the measures of interior angles <p>B. Properties of Parallelograms</p> <ol style="list-style-type: none"> 1. Identify properties of parallelograms 2. Use properties of parallelograms in real-life situations <p>C. Proving Quadrilaterals are Parallelograms</p> <ol style="list-style-type: none"> 1. Prove a quadrilateral is a parallelogram 2. Use coordinate geometry with parallelograms

		<p>VI. Quadrilaterals (continued)</p> <p>D. Rhombuses, Rectangles, and Squares</p> <ol style="list-style-type: none"> 1. Use properties of sides and angles of rhombuses, rectangles, and square 2. Use properties of diagonals of rhombuses, rectangles, and squares <p>E. Trapezoids and Kites</p> <ol style="list-style-type: none"> 1. Use properties of trapezoids 2. [Use properties of kites] <p>F. Special Quadrilaterals</p> <ol style="list-style-type: none"> 1. Identify special quadrilaterals given limited information 2. [Prove that a quadrilateral is a special type] <p>G. Areas of Triangles and Quadrilaterals</p> <ol style="list-style-type: none"> 1. Find the areas of squares, rectangles, parallelograms, and triangles 2. Find the areas of trapezoids, [kites], and rhombuses
<p>4.2/9,10,11,12</p> <p>4.3/9,10,11,12</p> <p>4.5/9,10,11,12</p> <p>8.1/9,10,11,12</p> <p>8.2/9,10,11,12</p> <p>9.2/9,10,11,12</p>	<p>A1,3,4</p> <p>D1</p> <p>E</p> <p>D2</p> <p>A1-5</p> <p>B1-4</p> <p>C1-4,6</p> <p>D1-6</p> <p>E1-3</p> <p>F1,4,5</p> <p>B11</p> <p>B3,4</p> <p>A1,3</p>	<p>VII. Similarity</p> <p>A. Ratio and Proportion</p> <ol style="list-style-type: none"> 1. Find and simplify the ratio of two numbers 2. Use the concept of significant digits 3. Use reciprocal and cross product properties <p>B. Problem Solving in Geometry with Proportions</p> <ol style="list-style-type: none"> 1. Find the geometric mean between two numbers 2. Using proportions to solve real-life problems <p>C. Similar Polygons</p> <ol style="list-style-type: none"> 1. Identify similar polygons 2. Use similar polygons to solve application problems <p>D. Similar Triangles</p> <ol style="list-style-type: none"> 1. Identify similar triangles 2. Use similar triangles to solve real-life problems <p>E. Proving Triangles are Similar</p> <ol style="list-style-type: none"> 1. Use SSS and SAS Similarity theorems to prove that two triangles are similar 2. Use similar triangles to solve real-life problems <p>F. Proportions and Similar Triangles</p> <ol style="list-style-type: none"> 1. Use proportionality theorems to find segment lengths 2. Solve applications using proportionality theorems
<p>4.1/9,10,11,12</p> <p>4.2/9,10,11,12</p>	<p>C1</p> <p>A1,3,4</p> <p>B4</p> <p>C2</p> <p>D1,2</p> <p>E1</p>	<p>VIII. Right Triangles And Trigonometry</p> <p>A. Similar Right Triangles</p> <ol style="list-style-type: none"> 1. Solve problems involving similar right triangles formed by the altitude drawn to the hypotenuse of a right triangle 2. Use geometric mean to solve problems

4.3/9,10,11,12 4.5/9,10,11,12 8.1/9,10,11,12 9.1/9,10,11,12 9.2/9,10,11,12	A1,3 D2 A1,3 B2 C4,6 D1,2,4 E3 F4,5 A8 B5 A1 C2	VIII. Right Triangles And Trigonometry (continued) B. Pythagorean Theorem 1. Prove the <i>Pythagorean Theorem</i> 2. Use the <i>Pythagorean Theorem</i> to solve real-life problems C. Converse of Pythagorean Theorem 1. Use the converse of the <i>Pythagorean Theorem</i> to solve problems 2. Use side lengths to classify triangles by their angle measures D. Special Right Triangles 1. Find the side lengths of special right triangles 2. Use special right triangles to solve real-life problems E. Trigonometric Ratios 1. Find the sine, cosine, and tangent of an acute angle 2. Use trigonometric ratios to solve real-life problems F. Solving Right Triangles 1. Solve for the side lengths and angle measures of a right triangle 2. Use right triangles to solve real-life problems G. Vectors 1. Find the magnitude and the direction of a vector 2. Add vectors 3. Use vectors in real-life situations H. Fractals 1. Create fractal images using iteration 2. Find patterns in area and perimeter of self-similar figures
4.1/9,10,11,12 4.2/9,10,11,12 4.3/9,10,11,12 4.5/9,10,11,12 8.1/9,10,11,12 9.2/9,10,11,12	A2 B4 C1 A1,3,4 D1,2 E1 D2 A1,3 B2 C4,6 D1,2,4 E3 F4,5 A8 A1, C2	IX. Circles A. Tangents to Circles 1. Identify segments and lines related to circles 2. Use properties of a tangent to a circle B. Arcs and Chords C. Use Properties of Arcs and Chords of a Circle D. Inscribed Angles 1. Use inscribed angles to solve problems 2. Use properties of inscribed polygons E. Other Angle Relationships in Circles 1. Use angles formed by tangents and chords to solve problems 2. Use angles formed by lines that intersect a circle to solve problems F. Segment Lengths in Circles 1. Find the lengths of segments of chords, tangents and Secants

		<p>IX. Circles (contained)</p> <p>G. Equations of Circles</p> <ol style="list-style-type: none"> 1. Write the equation of a circle 2. Use the equation of a circle and its graph to solve problems
<p>4.1/9,10,11,12</p> <p>4.2/9,10,11,12</p> <p>4.3/9,10,11,12</p> <p>4.4/9,10,11,12</p> <p>4.5/9,10,11,12</p> <p>8.1/9,10,11,12</p> <p>9.2/9,10,11,12</p>	<p>A2</p> <p>B4</p> <p>C1</p> <p>A1,3,4</p> <p>D1,2</p> <p>E1,2</p> <p>D2</p> <p>B2</p> <p>A1,3</p> <p>B2</p> <p>C4,6</p> <p>D1,2,4</p> <p>E3</p> <p>F4,5</p> <p>A8</p> <p>A1</p> <p>C2</p>	<p>X. Area Of Polygons And Circles</p> <p>A. Angle Measures in Polygons</p> <ol style="list-style-type: none"> 1. Find the measure of interior and exterior angles of polygons 2. Use measures of angles to solve real-life problems <p>B. Find the Area of Regular Polygon</p> <p>C. Perimeters and Areas of Similar Figures</p> <ol style="list-style-type: none"> 1. Compare perimeters and areas of similar figures 2. Use perimeters and areas of similar figures to solve real life problems. <p>D. Circumference and Arc Length</p> <ol style="list-style-type: none"> 1. Find the circumference of a circle and the length of a circular arc 2. Use circumference and arc length to solve real-life problems <p>E. Areas of Circles and Sectors</p> <ol style="list-style-type: none"> 1. Find the area of a circle and a sector or a circle 2. Use areas of circles and sectors to solve problems <p>F. Geometric Probability</p> <ol style="list-style-type: none"> 1. Find a geometric probability 2. Use geometric probability to solve real-life problems
<p>4.1/9,10,11,12</p> <p>4.2/9,10,11,12</p> <p>4.3/9,10,11,12</p> <p>4.5/9,10,11,12</p> <p>8.1/9,10,11,12</p> <p>8.2/9,10,11,12</p> <p>9.2/9,10,11,12</p>	<p>A2</p> <p>B4</p> <p>C1</p> <p>A1,2,3,4</p> <p>B2</p> <p>D1,2</p> <p>E1,2</p> <p>D2</p> <p>A1,3</p> <p>B2</p> <p>C4,6</p> <p>D1,2,4</p> <p>E3</p> <p>F4,5</p> <p>A8</p> <p>B9</p> <p>B4</p> <p>A1</p> <p>C2</p>	<p>XI. Surface Area And Volume</p> <p>A. Exploring Solids</p> <ol style="list-style-type: none"> 1. Use properties of polyhedra 2. Explore relationships between 2D shapes and polyhedra with Geometer's Sketchpad and isometric dot paper <p>B. Estimate and Calculate Surface Area of Prisms, Cylinders, Pyramids, and Cones</p> <p>C. Volume of Prisms, Cylinders, Pyramids, and Cones</p> <ol style="list-style-type: none"> 1. Estimate and calculate the volume of geometric solids 2. Solve real-life applications related to solid volume <p>D. Surface Area and Volume of Spheres</p> <ol style="list-style-type: none"> 1. Estimate and calculate the surface area and volume of a sphere 2. Solve real-life applications of spheres <p>E. Similar Solids (Honors)</p> <ol style="list-style-type: none"> 1. Find and use the scale factor of similar solids 2. Use similar solids to estimate and solve real-life problems

4.2/9,10,11,12	A1,3 B1,3,4 C2	XII. Transformations
4.5/9,10,11,12	E1,2 F1,5	<ul style="list-style-type: none"> A. Rigid Motion in a Plane <ul style="list-style-type: none"> 1. Identify the three basic rigid transformations 2. Use transformations in real-life situations B. Reflections and Rotations <ul style="list-style-type: none"> 1. Identify and use reflections and rotations in a plane 2. Identify relationship between reflection and symmetry C. Translations and Vectors <ul style="list-style-type: none"> 1. Identify and use translations in the plane 2. Use vectors in real-life situations D. Glide Reflections and Compositions <ul style="list-style-type: none"> 1. Identify glide reflections in a plane 2. Represent transformations as compositions of simpler transformations E. Dilations F. Create Tessellations Using Polygons

Note: The New Jersey Core Curriculum Content Standards can be accessed at www.state.nj.us

TARGETS FOR CONTENT COVERAGE (Regular and Honors)

1st Semester (Prior to Midterm)

- Chapter 1 Basics of Geometry**
- Chapter 2 Reasoning and Proof**
- Chapter 3 Perpendicular and Parallel Lines**
- Chapter 4 Congruent Triangles**
- Chapter 5 Properties of Triangles**
 5.4 Midsegment Theorem (Honors Only)
 5.6 Indirect Proof and Inequalities in Two Triangles (Honors Only)
- Chapter 6 Quadrilaterals**

2nd Semester

- Chapter 8 Similarity**
- Chapter 9 Right Triangles and Trigonometry**
- Chapter 10 Circles**
 Omit 10.7 Locus
- Chapter 11 Area of Polygons and Circles**
- Chapter 12 Surface Area and Volume**

12.7 Similar Solids (Honors Only)

Chapter 7 Transformations

7.5 Glide Reflections and Compositions (Honors Only)

Omit 7.6 Frieze Patterns

Cover Tessellations and Fractals through projects (textbook pages 452-453, 590-591, or other materials).

TARGETS FOR CONTENT COVERAGE (Concepts)

1st Semester (Prior to Midterm)

Chapter 1 Basics of Geometry

Chapter 2 Segments and Angles

Chapter 3 Parallel and Perpendicular Lines

Chapter 4 Triangle Relationships

Chapter 5 Congruent Triangles

Omit (5.5) Using Congruent Triangles

Chapter 6 Quadrilaterals

2nd Semester

Chapter 7 Similarity

Chapter 8 Polygons and Area

Chapter 9 Surface Area and Volume

Chapter 10 Right Triangles and Trigonometry

Chapter 11 Circles

- Transformations (sections are from chapters 3, 5, 7 and 11 as below)
 - 3.7 Translations
 - 5.7 Reflections and Symmetry
 - 7.6 Dilations
 - 11.8 Rotations

Also include material on Tessellations and Fractals (see textbook for Regular/Honors course).

KEY ALGEBRA TOPICS FOR REVIEW

Geometry teachers should devote significant time to reviewing the following Algebra 1 skills which are essential to success in Geometry. Through regular use of these skills in Geometry, all students should have mastered these Algebra skills which are also necessary prerequisites for success in Algebra 2.

All students should be able to:

- **Graph functions in the coordinate plane**
- **Solve linear equations involving one variable**
- **Solve simple linear inequalities**
- **Solve systems of equations involving two variables**
- **Create, evaluate, and simplify expressions by following order of operations, including parentheses**
- **Substitute a number for a variable in an equation or inequality and evaluate**
- **Translate a verbal phrase or sentence into an algebraic expression, equation, or inequality**
- **Use factoring to solve simple quadratic equations**
- **Simplify expressions and equations involving radicals**

RESOURCES/ACTIVITES GUIDE

Larson, Ron, Laurie Boswell, and Lee Stiff. *Geometry: Applying, Reasoning, Measuring*, Evanston, Illinois: McDougall Littell, 2004. (Regular and Honors)

Larson, Ron, Laurie Boswell, and Lee Stiff. *Geometry: Concepts and Skills*, Evanston, Illinois, 2004. (Concepts)

McDougal Littell Resource Materials:

Basic Skills Workbook

Warm-up Transparencies and Daily Homework Quiz

Standardized Test Practice Workbook

Worked-Out Solution Key

Practice Workbook with Examples

Note taking Guide with Transparencies

Chapter Resource Books

Test and Practice Generator CD-ROM

Easy Planner CD-ROM

e-Edition CD-ROM and Online

Personal Student Tutor CD-ROM

Power Presentations CD-ROM

Chapter Audio Summaries CD

Geometry in Motion VHS

SUGGESTED AUDIO VISUAL/COMPUTER AIDS

1. Geometer's Sketchpad software
2. Scientific calculators
3. Internet Access to:
www.classzone.com
www.mathforum.org/drmath
4. Manipulatives
5. Overhead projector with transparencies