

PLANNED COURSE

SUBJECT AREA: Mathematics

GRADE/COURSE: Geometry

Standard And Strand 2.1 Numbers, Number Systems and Number Relationships

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>A. Solve linear equations and inequalities and understand the operations of opposites and reciprocals.</p> <ul style="list-style-type: none"> • Compute absolute value. • Simplify equations involving exponents and roots. 	<p>1. Create equations based on:</p> <ul style="list-style-type: none"> • Basic definitions, postulates and theorems (e.g., midpoint, angle bisector, supplementary and complementary angles, vertical angles, etc.); • Congruence of polygons; • Inequality of sides and angles in triangles; • Properties of quadrilaterals; and • Angles of parallel lines. • Create and simplify expressions that represent distance between 2 points. • Simplify conjunction and disjunction expressions. • Design number line graphs. • Find areas of polygons and circles. • Find sides of right triangles using the Pythagorean Theorem. 	<p>Teacher observation</p> <p>Quizzes</p> <p>Tests</p> <p>Projects</p> <p>Homework</p> <p>Oral presentations</p> <p>Individual projects</p> <p>Portfolios</p>

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<ul style="list-style-type: none"> Understand the concept of subsets. 	<ul style="list-style-type: none"> Classify quadrilaterals and polygons. Create Venn Diagrams. 	<p>Teacher observation</p> <p>Quizzes</p> <p>Tests</p> <p>Projects</p> <p>Homework</p> <p>Oral presentations</p> <p>Individual projects</p> <p>Portfolios</p>

SUBJECT AREA: Mathematics
Standard And Strand 2.2 Computation and Estimation

GRADE/COURSE: Geometry

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>A. Develop and use computational concepts, operations and procedures on real numbers.</p> <p>B. Use estimation for problems for which an exact answer is not necessary.</p> <p>D. Recognize the degree of precision or tolerance level acceptable or appropriate for the task.</p> <p>F. Develop competence in the use of a scientific calculator.</p> <ul style="list-style-type: none"> • Understand the reasonableness of answers on a calculator. • Use a graphing calculator. 	<p>1. Simplify radical expressions. 2. Find sides of special triangles (30, 60, 90 and 45, 45, 90)</p> <p>1. Classify angles as acute, right and obtuse by observation. 2. Estimate the areas of irregular shapes and volumes of irregular solids.</p> <p>1. Measure line segments and angles using various increments of measurements. 2. Find the area of circles and polygons. 3. Calculate the volume of solids.</p> <p>1. Perform basic computations on the scientific calculator. 2. Solve trigonometric ratios (sin, cos and tan) and compare them to standard trigonometry tables. 3. Compute percent problems.</p>	<p>Teacher observation</p> <p>Quizzes</p> <p>Tests</p> <p>Projects</p> <p>Homework</p> <p>Oral presentations</p> <p>Individual projects</p> <p>Portfolios</p>

SUBJECT AREA: Mathematics
Standard And Strand 2.3 Measurement and Estimation

GRADE/COURSE: Geometry

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>A. Express the degree of accuracy appropriate to solve real world problems.</p> <ul style="list-style-type: none"> • Compare measures of angles. • Use absolute value. • Distinguish between real and imaginary values. • Represent linear and quadratic dimensions. • Determine the actual measurements from a scaled diagram or map. 	<ol style="list-style-type: none"> 1. Compute measurements in both degrees and angles. 2. Convert between degrees and radians. 3. Compute distance between 2 points. 4. Solve proportions involving quadratic equations. 5. Compute the area of plane figures. 6. Compute the volume of solids. 7. Compute actual measurements using proportional relationships. 	<p>Teacher observation</p> <p>Quizzes</p> <p>Tests</p> <p>Projects</p> <p>Homework</p> <p>Oral presentations</p> <p>Individual projects</p> <p>Portfolios</p>

SUBJECT AREA: Mathematics
Standard And Strand 2.4 Measurement and Estimation

GRADE/COURSE: Geometry

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>A. Develop two column deductive proofs.</p> <ul style="list-style-type: none"> • Use inductive proof and experiments to justify theorems about congruent figures. • Discern the difference between conditional, biconditional, converse, inverse and contrapositive statements. <p>B. Create valid arguments from given facts.</p> <p>D. Understand truth tables involving conjunction, disjunction and negation.</p> <p>E. Distinguish between inductive and deductive reasoning.</p>	<ol style="list-style-type: none"> 1. Display logical reasoning, given diagrams or other information. 2. Justify theorems about congruent figures, parallel lines, angles of triangles. 3. Write negation, biconditional, converse, inverse and contrapositive forms of sentences from a given statement. <ol style="list-style-type: none"> 1. Write statements in “if, then” form. <ol style="list-style-type: none"> 1. Create truth tables. 	<p>Teacher observation</p> <p>Quizzes</p> <p>Tests</p> <p>Projects</p> <p>Homework</p> <p>Oral presentations</p> <p>Individual projects</p> <p>Portfolios</p>

SUBJECT AREA: Mathematics

GRADE/COURSE: Geometry

Standard And Strand 2.5 Mathematical Problem Solving and Communication

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
A. Construct algorithms for solving multi step and non routine real world problems.	1. Select appropriate math concepts and apply them to non routine and multi step problems.	Teacher observation
B. Model situations geometrically to formulate and solve problems.	1. Write a clear, step by step explanation of the procedures of the geometry application.	Quizzes
C. Clearly explain, using appropriate math terminology, standard notation and mathematical rules and communicate the procedures used for all geometric applications.	1. Verbally defend reasoning. 2. Present problem solving procedures succinctly and correctly.	Tests
D. Summarize the results of a solution process and evaluate the degree to which the results were obtained.	1. Create Venn Diagrams showing relationships of quadrilaterals.	Projects
		Homework
		Oral presentations
		Individual projects
		Portfolios

SUBJECT AREA: Mathematics
Standard And Strand 2.6 Statistics and Data Analysis

GRADE/COURSE: Geometry

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>A. Define the various measures of central tendency.</p> <p>E. Determine the validity of the sampling method in a given study.</p> <p>F. Recognize how a change in data will affect each of the measures.</p>	<p>1. Use the results of class test scores to find the mean, median, mode and range.</p> <p>2. Compare the scores using data analysis of box and whisker graphs and stem and leaf graphs.</p> <p>3. Construct a pie chart with specific percents and compute the exact central angle measure for the information given.</p> <p>1. Create graphs to represent the results of their random sampling experiment.</p> <p>1. Collect data from their school community to conduct a random sampling experiment.</p>	<p>Teacher observation</p> <p>Quizzes</p> <p>Tests</p> <p>Projects</p> <p>Portfolios</p> <p>Homework</p> <p>Oral presentation</p>

SUBJECT AREA: Mathematics
Standard And Strand 2.7 Probability and Predictions

GRADE/COURSE: Geometry

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>A. Define and calculate conditional probability and compare odds.</p> <p>C. Draw conclusions regarding the validity of a probability or statistical argument.</p> <ul style="list-style-type: none">• Justify conclusions concerning validity. <p>E. Solve problems involving independent and compound events.</p>	<p>1. Calculate the probability that a class of students will all begin naming the vertices of a polygon with the same letter.</p> <p>2. Find the probability that a cube with different colored sides will turn up red on three successive rolls.</p>	<p>Teacher observations</p> <p>Quizzes</p> <p>Tests</p> <p>Homework</p> <p>Projects</p> <p>Portfolios</p> <p>Oral presentations</p>

SUBJECT AREA: Mathematics
Standard And Strand 2.8 Algebra and Functions

GRADE/COURSE: Geometry

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>G. Use systems of equations and matrices.</p> <p>K. Use transformations to graph linear functions in two variables.</p> <p>N. Graph equations and inequalities using technology as needed.</p> <p>S. Understand proportional relationships.</p>	<p>1. Differentiate between equations of parallel and perpendicular lines. 2. Represent graphs of lines and circles in equation form.</p> <p>1. Recognize the equation of a circle. 2. Represent graphs of lines and circles in equation form.</p> <p>1. Solve proportions to find measures of sides of similar triangles and polygons. 2. Construct pie charts using exact proportions of percents to angle measure of a circle.</p>	<p>Tests</p> <p>Quizzes</p> <p>Portfolios</p> <p>Projects</p> <p>Homework</p> <p>Presentations</p> <p>Teacher observation</p>

SUBJECT AREA: Mathematics
Standard And Strand 2.9 Geometry

GRADE/COURSE: Geometry

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>A. Become competent in the use of dynamic geometry software, such as the Geometer's Sketchpad.</p> <p>B. Prove two figures are similar using inductive and deductive reasoning and algebraic and coordinate proofs.</p> <ul style="list-style-type: none"> • Apply these properties to real life situations. • Understand congruency of various shapes including segments, angles, triangles, polygons, circles and solids. 	<ol style="list-style-type: none"> 1. Measure sides and angles of geometric figures. 2. Construct geometric figures. 3. Prove theorems inductively. 4. Use the Geometer's Sketchpad to inscribe regular polygons in a circle and compute the perimeter of the polygon. <ol style="list-style-type: none"> 1. Find the measure of sides of similar triangles. 2. Set up and solve proportions created by similar triangles in the real world. 3. Find examples of similar triangles in the real world. 4. Prove two triangles are similar using AA, SAS and SSS similarity. 	<p>Teacher observation.</p> <p>Quizzes.</p> <p>Tests.</p> <p>Projects</p> <p>Homework</p> <p>Oral presentations</p> <p>Individual projects</p> <p>Portfolio</p>

SUBJECT AREA: Mathematics
Standard And Strand 2.10 Trigonometry

GRADE/COURSE: Geometry

Resources:

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>A. Use graphing calculators to display periodic and circular functions.</p> <p>B. Identify, create and solve practical problems involving right triangles using the trigonometric functions and the Pythagorean Theorem.</p> <ul style="list-style-type: none"> • Use sine, cosine and tangent ratios to represent real life situations. • Know the Law of Sines and the Law of Cosines 	<ol style="list-style-type: none"> 1. Draw diagrams of angles less than 0 degrees and more than 180 degrees. 2. Describe the graphs of sine, cosine and tangent. <ol style="list-style-type: none"> 1. Apply the Pythagorean Theorem to find the length of a missing side of a right triangle, given an incomplete figure. 2. Determine the sine, cosine or tangent ratios of acute angles of right triangles, given two or three sides of the triangle. 3. Identify right, acute and obtuse angles. 4. Find the lengths of sides and measures of angles of oblique triangles. 	<p>Teacher observation</p> <p>Tests</p> <p>Quizzes</p> <p>Homework</p> <p>Portfolios</p> <p>Presentations</p> <p>Projects</p>

SUBJECT AREA: Mathematics
Standard And Strand 2.11 Concepts of Calculus

GRADE/COURSE: Geometry

Resources:

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>A. Understand maximum and minimum values of parabolic functions.</p> <ul style="list-style-type: none"> • Differentiate between functions and relations. • Determine the domain and range of functions and relations. • Identify intervals over which a function remains constant. <p>D. Determine sums of finite sequences of numbers and infinite geometric series.</p>	<ol style="list-style-type: none"> 1. Find the maximum and minimum values from a given equation and by inspecting a graph. 2. Perform the vertical line test on a function graph. 3. List the possible X-coordinates (domain) and Y-coordinates (range) of a set of ordered pairs. 4. Use a graphing calculator to identify intervals over which a function increases, decreases or remains constant. <ol style="list-style-type: none"> 1. Compute sums of finite sequences and infinite series. 2. Estimate area under curves using sequences of areas. 	<p>Teacher observation</p> <p>Tests</p> <p>Quizzes</p> <p>Homework</p> <p>Portfolios</p> <p>Presentations</p> <p>Projects</p>

Geometry Resources

Geometry, Holt, Rinehart and Winston, 1991: teachers' edition, activity sheets, transparencies, practice masters, reteaching masters, tests.

PSSA Mathematics Coach, Grade 11, Educational Design, David Gold, 2002

Resource Pro, Prentice Hall, Pre algebra, Algebra, Geometry, Advanced Algebra Test bank, 2001

Honors: Geometry, Amsco School Publication, Isadore Dressler, 1973