Map: **Geometry R+**   Type: **Consensus**   Grade Level: **10**   School Year: **2011-2012**

Author: **Jamie Pietrantoni**   District/Building: **Island Trees/Island Trees High School**

Created: **05/10/2011**   Last Updated: **06/28/2011**

	Essential Questions	Content	Skills	Assessments	Standards/PIs	Resources/Notes
Unit 1	What is the difference between a mathematical statement and a non-mathematical statement? How is a statement negated? How is negation symbolized? Why are truth tables used? How is the truth table constructed for negation? Disjunction? Conjunction? Conditional? Biconditional? Inverse, converse and contrapositive?	**Logic** Sentences, Statements, Truth Values and Negation Conjunctions and Disjunctions Conditionals and Biconditionals Inverse, Converse, Contrapositive Logically Equivalent Statements Constructing Truth Tables **Vocabulary** statement negation truth values conjunction disjunction conditional biconditional inverse converse	Restates a non-mathematical sentence using logic notation Generates a truth table for conjunctions and disjunctions Generates a truth table for conditionals and biconditionals Identifies hypotheses and conclusions from given statements		**MST1-K2-1A** **MST3-G.G.24** **MST3-G.G.25** **MST3-G.G.26** **MST3-G.RP.1** **MST3-G.RP.3** **MST3-G.RP.4** **MST3-G.CM.3**	

		contrapositive				
		logically equivalent				
		truth table				
		hypothesis				
		conclusion				
Unit 2	How do the various geometric figures relate to each other? How are angles classified? Why is the shortest distance between two points a straight line? How is a plane determined? Why are planes coplaner, and how do they intersect? How do parallel and perpendicular lines relate to each other?	**Geometric Relations** Classify angles according to their measure Midpoints and line bisectors Distance between points Perpendicular lines and planes ***Vocabulary*** ***colinear points*** ***congruent*** ***midpoint*** ***angles*** ***acute*** ***right*** ***obtuse*** ***straight angles***	Memorizes the definitions included in this unit Finds the measure of angles Recognizes vertical angles and adjacent angles Defines complementary angles and supplementary angles Adds angles Draws points, lines, collinear points Finds the length of line segments Finds the midpoint of a line segment Determines if two line segments are congruent Recognizes the result of		MST3-G.G.1 MST3-G.G.2 MST3-G.G.3 MST3-G.G.4 MST3-G.G.5 MST3-G.G.6 MST3-G.G.7 MST3-G.G.8 MST3-G.G.9	

					MST3-G.G.35	
		congruent angles *line segments* *rays* *opposite rays* *parallel lines* *parallel planes* *congruent line segments* *midpoint of line segment* *bisector of line segment* *bisector of an angle* *perpendicular lines* *distance from a point to a line*	intersecting planes and lines intersecting within a plane Defines perpendicular bisector			
Unit 3	How do angles formed by two parallel lines and a tranversal relate to each other?	**PROPERTIES OF PARALLEL LINES:** Relate parallel and perpendicular lines Parallel lines, transversals and related angles Congruent and supplementary angles formed when two lines are cut by a transversal Perpendicular transversals Two or more transversals to the same set of parallel lines **Vocabulary:** Parallel lines Transversal Interior angles	Memorizes the definitions and geometric thereoms included in this unit Identifies a transversal Recognizes alternate interior angles Names same - side interior angles Distinguishes corresponding angles and alternate exterior angles Categorizes all types of angles created by parallel lines cut by a transversal		MST3-G.G.35	

		Exterior angles				
		Corresponding angles				
		Alternate interior angles				
		Alternate exterior angles				
		Interior angles on the same side of the transversal				
		Perpendicular lines				
		Supplementary angles				
		Congruent angles				

	Essential Questions	Content	Skills	Assessments	Standards/PIs	Resources/Notes
Unit 4	How are triangles classified? How do you find the sum of the angles of a triangle? Why does the Pythagorean Theorem only work with right triangles? How can the Pythagorean Theorem be used to solve a real world problem? Why is it necessary to be able to find the area of a triangle?	**Triangles** Types of Triangles classified by Sides: Scalene, Isosceles, Equilateral Types of Triangles classified by Angles: Acute, Right, Obtuse Angle Side Relationships Triangle Inequalities Interior and Exterior Angles Special Right Triangles Pythagorean Theorem Area of a Triangle **Vocabulary** polygon scalene isosceles equilateral	Applies algebra skills in finding missing sides and angles of a triangle Identifies base angles of an isosceles triangle to be congruent Computes the sum of the angles of any triangle Relates the largest side to the largest angle, smallest side to the smallest angle, and middle side to the middle angle of a triangle Solves various problems involving right triangles and the Pythagorean Theorem Calculates the area of a triangle		**MST3-G.G.30** **MST3-G.G.31** **MST3-G.G.32** **MST3-G.G.33** **MST3-G.G.34** **MST3-G.G.48**	

		right				
		acute				
		obtuse				
		equiangular				
		legs				
		hypotenuse				
		altitude				
		median				
		angle bisector				
		perpendicular bisector				
		area				
Unit 5	How are ratios and proportions used to solve geometric problems? Where are ratio/proportions used in the real world? How are theorems used to help solve problems dealing with ratios, proportions, and similar triangles?	**Ratio/Proportion/Similar Triangles** Ratios/Proportions Means/Extremes Proportion with Line Segments	Applies the theorem in a ratio: the product of the means is equal to the product of the extremes Applies algebra skills determining values for missing sides/angles in similar triangles Draws conclusions from the relationships between sides of a triangle given one or more lines parallel to one side of a triangle		**MST3-G.G.42** **MST3-G.G.46** **MST3-G.G.45** **MST3-G.G.47** **MST3-G.G.44**	

		Similar Triangles Altitude to the Hypotenuse **Vocabulary** ratio proportion similar midsegment ratio of similtude	Recognizes that the length of the altitude is the mean proportional between the lengths of the segments of the hypotenuse			
Unit 6	How are various polygons classified? Why are concave and convex polygons different? How are the angles of a polygon classified? How is the sum of the interior angles of a polygon computed? How is each interior angle of a regular polygon computed? What is the sum of the exterior angles of a polygon? How is each exterior angle of a regular polygon computed?	**Interior and Exterior Angles of a Polygon** Types of Polygons Types of Angles in Polygons Compute the sum of the interior angles of various polygons Compute the value for each interior angle of a regular polygon Compute the sum of the exterior angles of various polygons	Memorizes the names for various types of polygons Identifies various angles in a polygon Evaluates the sum of the interior angles of various types of polygons Evaluates each interior angle of a regular polygon Recognizes that the sum of the exterior angles of any polygon is 360 degrees Evaluates each exterior angle of a regular polygon		MST3-G.G.36 MST3-G.G.37	

		Compute the value for each exterior angle of a regular polygon **<u>Vocabulary</u>** Interior angle exterior angle pentagon hexagon octagon decagon n-gon regular polygon convex polygon concave polygon				

	Essential Questions	Content	Skills	Assessments	Standards/PIs	Resources/Notes
Unit 7	Why is it important to continue to use prior theorems and properties when working with quadrilaterals? How can we identify a quadrilateral that is a parallelogram? Why is a rectangle a special type of parallelogram? What properties distinguish a rhombus from a rectangle? Why is a square a rhombus but a rhombus NOT a square? How do trapezoids differ from other quadrilaterals?	**Quadrilaterals** Review Consecutive/Adjacent Vertices Consecutive/Adjacent Angles Consecutive/Adjacent Sides Quadrilaterals Opposite Sides/Adjacent Sides Diagonals Parallelograms Opposite sides are parallel A diagonal divides a parallelogram into two congruent triangles Opposite sides are congruent Consecutive angles are supplementary The diagonals bisect each other	Uses methods to find missing angles of parallelograms Assesses various sides and angles using appropriate properties of each special parallelogram (rectangle, square, rhombus) Determines if a quadrilateral is a special parallelogram (rectangle, square, rhombus) using theorems and properties such as consecutive and opposite angles Recalls the properties of an isosceles trapezoid Applies the properties of an isosceles trapezoid and algebra skills to compute angles		MST3-G.G.38 MST3-G.G.39 MST3-G.G.40 MST3-G.G.41	

Rectangles

A rectangle has all the properties of a parallelogram

A rectangle has four right angles (equiangular)

The diagonals of a rectangle are congruent

Rhombus

A rhombus has all the properties of a parallelogram

A rhombus is equilateral

The diagonals of a rhombus are perpendicular to each other

The diagonals of a rhombus bisect its angles

Square

A square has all the properties of a rectangle

A square has all the properties of a rhombus

Trapezoids

One pair of parallel sides

Median of a trapezoid

Isosceles trapezoid

Vocabulary

parallel

congruent

consecutive angle

opposite angle

diagonal

supplementary

bisect

equiangular

equilateral

isosceles

median of a trapezoid

Unit 8					
How do the radii of a circle relate to each other? What are congruent circles and congruent arcs? How do central angles and arcs relate to each other? How is an inscribed angle measured? How are the measures of angles formed by two chords intersecting within a circle computed? How are the measures of angles formed by two tangents, two secants or a tangent and a secant computed? How are the lengths of the segments of two chords which intersect within a circle calculated? How are the lengths of the segments of tangents and secants intersecting outside the circle measured? How is a polygon circumscribed about a circle? How is a polygon inscribed in a circle?	**Circles** Parts of a circle Angles in a circle Angles outside the circle formed by tangents and secants Lengths of line segments formed by two chords intersecting within a circle Lengths of line segments formed by two tangents, two secants, or a tangent and a secant intersecting outside a circle Polygons inscribed in a circle Polygons circumscribed about a circle **Vocabulary** circle central angle arc radii	Memorizes definitions associated with circles Computes the measure of central angles, inscribed angles Computes the measure of an angle formed by two chords intersecting within a circle Computes the measure of an angle formed by two tangents, two secants or a tangent and a secant Computes the measures of the line segments formed by two chords intersecting within a circle Computes the measure of the line segments formed by a secant and a tangent or two secants intersecting outside the circle Recognizes an inscribed polygon Recognizes a circumscribed polygon		**MST3-G.G.49** **MST3-G.G.50** **MST3-G.G.51** **MST3-G.G.52** **MST3-G.G.53**	

		chords					
		inscribed angle					
		equidistant					
		inscribed polygon					
		tangent					
		secant					
		circumscribed polygon					

Key to Standards used in this Map

MST1-K2-1A [1 occurence] - MST Standard 1 - Key Idea 2 [Mathematical Analysis ii] - Performance Indicator 1A - use inductive reasoning to construct, evaluate, and validate conjectures and arguments, recognizing that patterns and relationships can assist in explaining and extending mathematical phenomena. [Intermediate]

MST3-G.RP.1 [1 occurence] - MST Standard 3 - Reasoning and Proof Strand - Students will recognize reasoning and proof as fundamental aspects of mathematics. - Performance Indicator G.RP.1 - recognize that mathematical ideas can be supported by a variety of strategies [Geometry]

MST3-G.RP.3 [1 occurence] - MST Standard 3 - Reasoning and Proof Strand - Students will make and investigate mathematical conjectures. - Performance Indicator G.RP.3 - investigate and evaluate conjectures in mathematical terms, using mathematical strategies to reach a conclusion [Geometry]

MST3-G.RP.4 [1 occurence] - MST Standard 3 - Reasoning and Proof Strand - Students will develop and evaluate mathematical arguments and proofs. - Performance Indicator G.RP.4 - provide correct mathematical arguments in response to other students' conjectures, reasoning, and arguments [Geometry]

MST3-G.CM.3 [1 occurence] - MST Standard 3 - Communication Strand - Students will communicate their mathematical thinking coherently and clearly to peers, teachers, and others. - Performance Indicator G.CM.3 - present organized mathematical ideas with the use of appropriate standard notations, including the use of symbols and other representations when sharing an idea in verbal and written form [Geometry]

MST3-G.G.1 [1 occurence] - MST Standard 3 - Geometry Strand - Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes. [Geometric Relationships] - Performance Indicator G.G.1 - know and apply that if a line is perpendicular to each of two intersecting lines at their point of intersection, then the line is perpendicular to the plane determined by them [Geometry]

MST3-G.G.2 [1 occurence] - MST Standard 3 - Geometry Strand - Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes. [Geometric Relationships] - Performance Indicator G.G.2 - know and apply that through a given point there passes one and only one plane perpendicular to a given line [Geometry]

MST3-G.G.3 [1 occurence] - MST Standard 3 - Geometry Strand - Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes. [Geometric Relationships] - Performance Indicator G.G.3 - know and apply that through a given point there passes one and only one line perpendicular to a given plane [Geometry]

MST3-G.G.4 [1 occurence] - MST Standard 3 - Geometry Strand - Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes. [Geometric Relationships] - Performance Indicator G.G.4 - know and apply that two lines perpendicular to the same plane are coplanar [Geometry]

MST3-G.G.5 [1 occurence] - MST Standard 3 - Geometry Strand - Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes. [Geometric Relationships] - Performance Indicator G.G.5 - know and apply that two planes are perpendicular to each other if and only if one plane contains a line perpendicular to the second plane [Geometry]

MST3-G.G.6 [1 occurence] - MST Standard 3 - Geometry Strand - Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes. [Geometric Relationships] - Performance Indicator G.G.6 - know and apply that if a line is perpendicular to a plane, then any line perpendicular to the given line at its point of intersection with the given plane is in the given plane [Geometry]

MST3-G.G.7 [1 occurence] - MST Standard 3 - Geometry Strand - Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes. [Geometric Relationships] - Performance Indicator G.G.7 - know and apply that if a line is perpendicular to a plane, then every plane containing the line is perpendicular to the given plane [Geometry]

MST3-G.G.8 [1 occurence] - MST Standard 3 - Geometry Strand - Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes. [Geometric Relationships] - Performance Indicator G.G.8 - know and apply that if a plane intersects two parallel planes, then the intersection is two parallel lines [Geometry]

MST3-G.G.9 [1 occurence] - MST Standard 3 - Geometry Strand - Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes. [Geometric Relationships] - Performance Indicator G.G.9 - know and apply that if two planes are perpendicular to the same line, they are parallel [Geometry]

MST3-G.G.24 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.24 - determine the negation of a statement and establish its truth value [Geometry]

MST3-G.G.25 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.25 - know and apply the conditions under which a compound statement (conjunction, disjunction, conditional, biconditional) is true [Geometry]

MST3-G.G.26 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.26 - identify and write the inverse, converse, and contrapositive of a given conditional statement and note the logical equivalences [Geometry]

MST3-G.G.30 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.30 - investigate, justify, and apply theorems about the sum of the measures of the angles of a triangle [Geometry]

MST3-G.G.31 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.31 - investigate, justify, and apply the isosceles triangle theorem and its converse [Geometry]

MST3-G.G.32 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.32 - investigate, justify, and apply theorems about geometric inequalities, using the exterior angle theorem [Geometry]

MST3-G.G.33 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.33 - investigate, justify, and apply the triangle inequality theorem [Geometry]

MST3-G.G.34 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.34 - determine either the longest side of a triangle given the three angle measures or the largest angle given the lengths of three sides of a triangle [Geometry]

MST3-G.G.35 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.35 - determine if two lines cut by a transversal are parallel, based on the measure of given pairs of angles formed by the transversal and the lines [Geometry]

MST3-G.G.36 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.36 - investigate, justify, and apply theorems about the sum of the measures of the interior and exterior angles of polygons [Geometry]

MST3-G.G.37 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.37 - investigate, justify, and apply theorems about each interior and exterior angle measure of regular polygons [Geometry]

MST3-G.G.38 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.38 - investigate, justify, and apply theorems about parallelograms involving their angles, sides, and diagonals [Geometry]

MST3-G.G.39 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.39 - investigate, justify, and apply theorems about special parallelograms (rectangles, rhombuses, squares) involving their angles, sides, and diagonals [Geometry]

MST3-G.G.40 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.40 - investigate, justify, and apply theorems about trapezoids (including isosceles trapezoids) involving their angles, sides, medians, and diagonals [Geometry]

MST3-G.G.41 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.41 - justify that some quadrilaterals are parallelograms, rhombuses, rectangles, squares, or trapezoids [Geometry]

MST3-G.G.42 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.42 - investigate, justify, and apply theorems about geometric relationships, based on the properties of the line segment joining the midpoints of two sides of the triangle [Geometry]

MST3-G.G.44 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.44 - establish similarity of triangles, using the following theorems: aa, sas, and sss [Geometry]

MST3-G.G.45 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.45 - investigate, justify, and apply theorems about similar triangles [Geometry]

MST3-G.G.46 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.46 - investigate, justify, and apply theorems about proportional relationships among the segments of the sides of the triangle, given one or more lines parallel to one side of a triangle and intersecting the other two sides of the triangle [Geometry]

MST3-G.G.47 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.47 - investigate, justify, and apply theorems about mean proportionality [Geometry]

MST3-G.G.48 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.48 - investigate, justify, and apply the pythagorean theorem and its converse [Geometry]

MST3-G.G.49 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.49 - investigate, justify, and apply theorems regarding chords of a circle [Geometry]

MST3-G.G.50 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.50 - investigate, justify, and apply theorems about tangent lines to a circle [Geometry]

MST3-G.G.51 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.51 - investigate, justify, and apply theorems about the arcs determined by the rays of angles formed by two lines intersecting a circle when the vertex is inside the circle, on the circle, and outside the circle [Geometry]

MST3-G.G.52 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.52 - investigate, justify, and apply theorems about arcs of a circle cut by two parallel lines [Geometry]

MST3-G.G.53 [1 occurence] - MST Standard 3 - Geometry Strand - Students will identify and justify geometric relationships formally and informally. [Informal and Formal Proofs] - Performance Indicator G.G.53 - investigate, justify, and apply theorems regarding segments intersected by a circle [Geometry]