Geometry Core Curriculum Map

	Standard	Content Objective	Process Standard/Objective	Suggested materials/strategies
September	Algebra Geometry

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October	Geometry Algebra Geometry	**3.1.4** - Measure angles and review classifications **3.1.4** - Identify angle pairs as adjacent, complementary, supplementary, linear or vertical **3.1.6, 3.1.7** - Classify angle pairs formed by two parallel lines cut by a transversal. Prove lines parallel through angle relationships **3.3.1** - Construct angles a) copy angles b) bisect angle to use in a real world situation, e.g. cutting molding in construction c) construct other angle measures including 45º, 60º and 90º, etc. **3.1.12** - Classify triangles using properties and discover those properties based on classification **3.1.12, 2.2.6** - Solve for unknown angle using sum of angles in a triangle **3.1.9** - Identify and construct a) a median using cut-out triangles and center of gravity b) an angle bisector c) an altitude	**Problem solving:** make a model or simulation, draw a picture or diagram, eliminate possibilities, extend knowledge by considering the strategies of others, propose and critique alternative approaches **Reasoning and proof:** recognize conclusions as valid or invalid, justify conclusions ,"What makes you think that?", make and investigate mathematical conjectures **Communication:** express mathematical ideas coherently, oral presentations and written communication **Connections**: find applications in newspapers, magazines, and other sources, recognize and apply relationship to art and science, extend investigations into real-world **Representation:** use a variety of visual representations and physical models, use appropriate symbolic notation	Protractor, Geoboards, dot paper, string, real-world ideas (physical therapists use a gonimeter to measure angle of joint flexibility), Patty Paper, pictures and diagrams, cooperative groups Patty Paper, Student Formations, Geometer's Sketchpad, Geoboards, pegboard, spaghetti, paper folding, compass and straight edge Pattern Blocks, Geometer's Sketchpad, miter saw and box, construction molding Paper folding, string, Geoboards, real-world objects, pictures snack items Patty Paper, Geometer's Sketchpad, compass, Geoboards, triangle models, hanging a weight from vertex for altitude, paper folding
November	Geometry Algebra Geometry	**3.1.1, 3.1.8, 3.3.4** - Review definition of congruent triangles and discover congruency using hands-on experiences a) formulate rules for proving congruency b) prove congruency **3.1.1, 3.1.8, 3.3.4** - Review proportional reasoning, e.g. scale drawings, indirect measure **2.2.6, 3.1.8** - Review solving for a missing side of similar triangles **3.1.8** - Discover conditions that make triangles similar by increasing two sides of two sides of a triangle **3.1.8** - Prove similarity of triangles	**Problem solving:** select and use appropriate methods for computation (mental, calculator, pencil and paper), guess and check, choose appropriate operations, make a diagram, extend knowledge by considering the thinking of others, propose alternative approaches **Reasoning and proof:** examine pattern for regularities and irregularities, link problem solving to a sequence of steps, use a variety of formal and informal proofs **Communication:** organize and consolidate mathematical thinking, express mathematical ideas coherently using correct language Connections: formulate real-world situations, establish connections among physical models and the mathematical expression or representation **Representation**: represent visually, numerically, geometrically and algebraically, use technology	Mira (transparent reflector), Patty Paper, triangles, Geoboards, Geometer's Sketchpad, cooperative groups, graphing calculator Graph paper, pictures and diagrams, Pattern Blocks, atlas, measuring devices Patty Paper, compass and straight edge, Geoboards, pegboard, dot paper, measure real-world objects

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December	Algebra Geometry Algebra	**2.2.3** - Apply Pythagorean Theorem to find the missing measures of right triangles **3.2.3** - Develop the distance formula using the Pythagorean Theorem **3.2.3** - Apply distance formula to prove diagonals of a rectangle are congruent **2.1.3** - Discover relationships between the sides of a special right triangle (30-60-90 and 45-45-90 triangles) **2.1.3** - Solve problems using the properties of special right triangles **2.2.3, 2.2.6, 3.3.4** - Using altitude to the hypotenuse of a right triangle and the geometric mean, find missing measures of right triangles	**Problem solving:** propose and critique alternative approaches to solving problems, make an equation, manipulate formulas, solve a related simpler problem, make a model, ask, "How are these ideas related?" **Reasoning and proof:** explain and justify problem solving procedures, identify information as necessary or not, make and investigate mathematical conjectures **Communication:** express ideas coherently, use portfolios or journals, group discussion Connections: use real-world applications, use physical models, e.g. Leaning Tower of Pisa, consider historical and multicultural influences **Representation:** use visual representations, graph paper, models and technology	Centimeter cubes, Cuisenaire rods, color tiles, calculator, "Cut-apart Proof Puzzle" Program calculator with a formula Real-world objects and situations, graph paper. Make a square from balsa wood using no measuring tools Color Tiles, protractor, table or spreadsheet Calculator, real-world problems, use a homemade clinometer (protractor, string and straw) having fixed degrees Diagrams, real-world problems such as civil engineering and civic planning, Geometer's Sketchpad
January	Geometry Algebra	**3.3.1** - Use similar right triangles to solve real-world problems of indirect measurement **2.2.1** - Identify the adjacent side, opposite side and hypotenuse given any acute angle in a right triangle a) write ratios for these sides without using trigonometric terms b) write trigonometric ratios as a fraction and a decimal using trigonometric relations and terminology (sine, cosine, tangent) **2.2.1** - Using a calculator, find the angle measurement in degrees when given a trigonometric ratio **2.2.2** - Find the trigonometric ratio given the angle. Use a calculator **2.2.3, 3.3.4** - Solve real world problems using trig ratios e.g. height of immeasurable objects, distance, angle of elevation, angle of descent, etc. **2.2.4** - Find the missing part of a triangle using the law of sines and cosines	**Problem solving:** draw pictures, select and use appropriate methods of computing, make an equation, use proportional reasoning, clarify new math concepts and terms **Reasoning and proof:** identify information as necessary, sufficient or extraneous, identify conclusions as valid or invalid, examine patterns, note regularities and irregularities **Communication:** employ precise language and notation, express ideas clearly, group discussions, portfolios, journals **Connections:** formulate real-world situations, solve and justify answers, apply math outside the classroom and in everyday life **Representation:** use a variety of visual representations (manipulatives, technology, models, paper), explore and formulate conjectures, represent situations algebraically, verbally, graphically, and geometrically	Real-world problems, clinometer, indirect measure using mirrors, physical experiments, triangle models, diagrams and pictures, The Greedy Triangle (literature), Geoboards, cooperative groups, use different colored bands to identify sides of a triangle on a Geoboard. Calculators, tables Calculator Calculator, real-world objects, clinometer, calculators Equations, calculators, pictures and videos of real-world applications, Geoboards, dot paper

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February	Geometry Algebra Geometry Algebra	**3.1.10** - Review the classification of quadrilaterals, e.g. rhombus, square, rectangle, kite, trapezoid, parallelogram **3.2.3** - Verify the classification of these quadrilaterals using coordinate geometry a) review distance formula, slope of a line, and midpoint of a line b) using these formulas, classify quadrilaterals **3.2.3** - Verify that diagonals of a rectangle are congruent using the distance formula **2.1.4** - Review the area of quadrilaterals and discover the effect on area when changing linear dimensions **4.2.1, 4.2.4** - Solve real-world problems using the area of regular polygons and irregular regions **2.1.2** - Use patterns to determine the relationship between the measure of angles and the number of sides on a polygon a) find the sum of the interior angles in a polygon b) find the measure of an interior angle of a regular polygon c) find the sum of the exterior angles of a polygon	**Problem solving:** look for patterns, make a model, draw a picture or diagram, solve a variety of multi-step problems, extend problems, estimate solutions, extend knowledge by considering the strategies of others **Reasoning and proof:** make and investigate conjectures, identify information as necessary or unnecessary, examine patterns and realize that observing a pattern does not constitute a proof **Communication:** organize and consolidate thinking, use group discussions, journals or portfolios, employ precise language and notation **Connections**: establish connections among math representation and physical models, find applications outside the classroom, use magazines, newspapers, physical models and other sources, consider historical and cultural contributions **Representation:** use a variety of visual representations (manipulatives, technology, paper, models), represent verbally, algebraically and geometrically, use appropriate symbols	"I have... Who has?" Geoboards, dot paper, isometric paper, Pattern Blocks Graph paper, Geometer's Sketchpad, calculator, cooperative groups Real-world objects, Geoboards, dot paper, peg board, graph paper Color Tiles, centimeter cube surface, cut-out models, Geoboards, dot paper Geometer's Sketchpad, string and student formations, graph paper, Geoboards Pattern Blocks, spreadsheet or table, sketching diagrams, pencil or spaghetti to extend line segments, Geometer's Sketchpad, real-world objects, protractor, table or spreadsheet, calculator

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March	Geometry Algebra Measurement Geometry Probability	**3.2.4** - Use coordinate geometry to analyze transformations of polygons discovering the change in coordinate values a) perform translations b) perform rotations (90º, 180º, 270º) c) perform reflections d) perform dilations **3.1.11** - Identify parts of circle (radii, diameters, chords, secants, arcs, sectors, central angles, inscribed angles, tangents of a circle) **3.2.1** - Introduce the circle on a coordinate system and graph a circle given the equation in the form $(x-h)^2 + (y-k)^2 = r^2$. Write the equation of a circle given a graph **3.3.2** - Define pi as a ratio between circumference and diameter **2.1.4**-Review the area of circle given the formula and explore how a change in the length of the radius affects the area of a circle **3.3.3**-Demonstrate the relationship between the measurement of intercepted an arc, an inscribed angle, and a central angle **4.2.2**-Find the area of a sector **4.2.2**-Discover arc length as a fraction of the circumference **5.2.1**-Identify geometric probabilities by performing simulations involving area or length, e.g. areas on a target **5.2.2** - Calculate geometric probability using the area of two different regions	**Problem solving:** extend math knowledge by considering the thinking of others, propose, critique and alternative approaches, choose appropriate operations, guess and check, solve a related simpler problem **Reasoning and proof:** explain and justify problem solving procedures, "Why do you think so?", use informal proof where appropriate , make conjectures, find applications outside classroom **Communication:** express math ideas clearly to peers, teachers and others, employ precise notation, organize and consolidate thinking, group discussions, portfolios **Connections:** formulate real-world situations, solve and justify them, apply concepts outside classroom, establish connections among mathematical expressions and physical models, use pictures and real-world sources **Representation:** use a variety of visual representations (manipulatives, technology, paper, models), represent verbally, algebraically and geometrically	Graphing calculators, Mira, Geoboards, Geometer's Sketchpad, student formations, graph paper, constructions Pictures and diagrams, Geoboards,(circular side) dot paper , real-world applications Graph paper, graphing calculator, Geometer's Sketchpad , graphs M & M circumference activity String ratio to discover pi, use a table or spreadsheet to record data, Sir Cumference and the Dragon of Pi (literature) Geoboards (circular side) and protractors, string, circular objects, cooperative groups Graphing calculator applications, students throwing for a bulls eye on a target, carnival game throwing beanbag through holes in a rectangular surface, spinner with colored sections weighted differently Cutting paper, spinners,

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April	Geometry Measurement Algebra Geometry	**3.1.13** - Classify 3-D objects according to their properties a) use nets to build shapes b) **2.1.2** - use a table to derive Euler's Formula relating faces edges and vertices **4.2.3** - Calculate the surface area and volume of 3-D objects (prisms, cones, spheres, cylinders, and pyramids) given the formulas **2.1.4** - Discover the effect on volume when changes are made in the linear dimensions of the shape **3.3.5** - Sketch the cross sections of solids	**Problem solving:** make a model or simulation, check for reasonableness or results, develop clarification, "How does this apply here?", solve multi-step problems, estimate solutions, work backwards **Reasoning and proof:** make and investigate conjectures, identify information as necessary and sufficient and conclusions as valid **Communication:** organize and consolidate thinking using group discussions, presentations **Connections:** apply to real world situations that require extended investigation, connect math expressions to physical models **Representation:** use a variety of visual representations (models, nets, and technology)	Nets, toothpicks and Swedish Berries or Dots for building objects, straw and paper clips, real-world models and objects, pop-up dodecahedron, geometric solids, tables, food items (cans, boxes, bucket etc.) Ice cream cone containing a scoop of ice cream, number of painted surfaces on a cube, or number of frosted sides on a cake (rectangular) when cut into cubes, linking cubes Tables/spreadsheets, isometric paper, linking cubes, calculators Use food to cut cross sections, fill a clear geometric solid and tip it to a different position to see cross sections, salt dough, folded cardboard shapes
May	All standards	- Real world projects applying geometric knowledge - Review for CRT's	**Problem solving:** solve a variety of multi-step problems including puzzles, open-ended or extended problems, ask questions like, "Where have we seen this before?", propose and critique alternative approaches **Reasoning and proof:** explain and justify procedures, identify information as needed or not, as sufficient or insufficient **Communications:** organize and consolidate math thinking through group discussion, journals, portfolios, oral or written reports, employ precise language and notation **Connections:** formulate real-world situations or investigations, solve and justify answers, explore multicultural and historical contributions **Representation:** use a variety of visual representations, use correct notation	Real-world problems and projects, hands on materials, calculators