Moon Area School District Curriculum Map

Course: Geometry
Grade Level: 9
Content Area: Mathematics
Frequency: Full-Year Course

Primary Resource(s) & Technology:
McDougal Littell Geometry, IXL online software,
Microsoft Teams, Promethean Boards, Student Laptops

Pennsylvania and/or focus standards referenced at:
www.pdesas.org
www.education.pa.gov

Big Ideas/EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
What methods can you use to bisect a segment? Describe the relationships between the four angles formed by two intersecting lines. How do you find the circumference and area of a circle if you know its diameter? Name and describe different polygons	2.1.11.A (Introduced) 2.3.11.B (Introduced) 2.4.11.E (Introduced) 2.5.11.B (Introduced) 2.9.11.A (Introduced)	**Basics of Geometry - Chapter 1** Use segment postulates and use the distance formula to measure distances. Use angle postulates and classify angles as acute right obtuse or straight. Bisect a segment and bisect an angle. Identify vertical angles, linear pairs, complementary, and supplementary angles. Find the perimeter and area of common plane figures and use a general problem-solving plan.	August - September

		Construct geometric figures using dynamic geometry tools (e. Cabri Geometre).	
Create a statement and write its converse. Rewrite a biconditional statement as a conditional statement and its converse. If AB=CD, and CD=EF, write a valid statement about AB and EF and give a reason. Draw an example diagram to show two angles that are linear pairs with another angle. In a two column proof, what can be written under the reasons column? Explain the	2.4.11.A (Introduced) 2.4.11.E (Introduced) 2.5.11.B (Introduced) 2.5.11.C (Introduced) 2.8.11.D (Introduced) 2.8.11.E (Introduced) 2.8.11.J (Introduced) 2.8.11.L (Introduced) 2.9.11.G (Introduced)	**Reasoning and Proof - Chapter 2** Recognize and analyze a conditional statement and write postulates about points lines and planes using conditional statements. Recognize and use conditional and biconditional statements. Use properties from algebra and properties of length and measure to justify segment and angle relationships. Justify statements about congruent segments and write reasons for steps in a proof. Use angle congruence properties and prove properties about special pairs of angles.	October/ November

difference between a postulate and a theorem. How is the converse of a statement related to the statement? What can you conclude about two coplanar lines that are perpendicular to the same line? If you know two points on line p and two points on line q how could you tell pIIq? If you know the slope of one line how do you find the slope of a line that is perpendicular to it?			
What types of angle pairs are formed by transversals? How are corresponding angles and alternate interior angles related for two parallel lines and a	2.4.11.A (Introduced) 2.4.11.E (Introduced) 2.5.11.B (Introduced) 2.5.11.C (Introduced)	**Parallel and Perpendicular Lines - Chapter 3** Demonstrate mathematical solutions to problems (e.g., in the Identify relationships between lines and identify angles formed by transversals. and other types of mathematical representations to communic Write different types of proofs and prove results about perpendicular lines. Present mathematical procedures and results clearly, systema Prove and use results about parallel lines and transversals and use properties of parallel lines to solve real-life problems.	November / December

transversal? Given 2 parallel lines cut by a transversal and one of the 8 angles formed, find the other seven. How do you prove lines parallel? What is the difference between what you can prove with the Corresponding Angles Converse and the Corresponding Angles Postulate? How do you find the slope of a line given the coordinates of two points on the line? How do you find the slope of a line from a graph without using a formula? How do you write the equation of a	2.8.11.D (Introduced) 2.8.11.E (Introduced) 2.8.11.J (Introduced) 2.8.11.L (Introduced)	Prove that two lines are parallel and use properties of parallel lines to solve real-life problems. Use equations to represent curves Use properties of parallel lines in real-life situations and construct parallel lines using straightedge and compass. Find slopes of lines and use slope to identify parallel lines in a coordinate plane and write equations of lines in a coordinate plane. Use slope to identify perpendicular lines in a coordinate plane and write equations of perpendicular lines.	s, inequalities, systems of equ de routine and non-routine pr (e.g., lines, circles, ellipses, between algebraic equations and the coordinate plane. when given the graph of the line, on the line.

line? When given a graph, do you have to use specific points to find the slope or can you use any 2 points on the line? What is another way to graph the line besides by using 2 points?			
How can you classify a triangle by its sides? by its angles? Draw and name two triangles and explain which corresponding angles and sides are congruent. How can you use the SAS congruence postulate to prove two triangles congruent? What information do you need to know in order to use the AAS	2.3.11.B (Introduced) 2.4.11.A (Introduced) 2.4.11.B (Introduced) 2.5.11.B (Introduced) 2.9.11.B (Introduced) 2.9.11.D (Introduced) 2.9.11.G (Introduced) 2.9.11.I (Introduced)	**Congruent Triangles - Chapter 4** Classify triangles by their sides and angles and find angle measures in triangles. Identify congruent figures and corresponding parts and prove that two triangles are congruent. Prove that triangles are congruent using the SSS and SAS postulates and use congruence postulates in real-life problems. Prove that triangles are congruent using the ASA Congruence Postulate and the AAS Congruence Theorem and use congruence postulates in real-life problems. Use congruent triangles to plan and write proofs and to prove constructions are valid. Use properties of isosceles, equilateral, and right triangles.	December/ January

Congruence Theorem to prove two triangles are congruent? How do you plan a proof? How could you use the HL Congruence theorem to prove two isosceles triangles congruent?			
How do you write a coordinate proof? How do you find the point of concurrency of the perpendicular bisectors of the sides of a triangle? How are the Perpendicular Bisector Theorem and the Angle Bisector Theorem different? When can you conclude that a point is on the perpendicular	2.4.11.A (Introduced) 2.4.11.B (Introduced) 2.5.11.B (Introduced) 2.9.11.B (Introduced) 2.9.11.D (Introduced)	**Relationships within Triangles - Chapter 5** roofs or proof by contradiction to v Construct valid arguments from stated facts. Use properties of perpendicular bisectors and use properties of angle bisectors to identify equal distances. inology, standard notation, m of mathematical representations to communic concepts, procedures, generalizations, ideas and results. Use properties of perpendicular bisectors of a triangle and use properties of angle bisectors of a triangle. polygons are congruent or sim d deductive proofs. Identify corresponding parts in congruent triangles to solve pr Use properties of the medians and altitudes of a triangle Use triangle measurements to decide which side is longest or which angle is largest and use the Triangle Inequality. Read and write an indirect proof and use the Hinge Theorem and its converse to compare side lengths and angle measurements.	January/ February

bisector or an angle? Where can the centroid of a triangle be located? Where can the orthocenter of a triangle be located? How do you find the possible third side of a triangle if you know the lengths of two sides? What are the steps in writing an indirect proof?			
How do you use proportions in everyday life? How do you calculate the actual distance from a scale drawing? If two figures are similar, how do you find the length of a missing side?	2.1.11.A (Introduced) 2.2.11.B (Introduced) 2.2.11.C (Introduced) 2.2.11.D (Introduced) 2.9.11.F (Introduced) 2.9.11.H (Introduced)	**Similarity - Chapter 6** (e.g., opposite, reciprocal, absolute value, rais finding logarithms). Find and simplify the ratio of two numbers and use proportions to solve ems for which an exact answer is read-life problems Construct and apply mathematical models, including lines and values of related quantities. Use properties of proportions and use proportions to solve real-life problems unt of error that may exist in a c Use the properties of angles, arcs, chords, tangents and secan Use similarity theorems to prove that two triangles are similar and use similar triangles to solve real-life problems re and its image using various trans Given a line parallel to one side of a	February/ March

If the triangles were congruent, what would the ratio be of the corresponding sides. How can you show that 2 triangles are similar. How can you write a similarity statement for 2 similar triangles? How do you prove that two triangles are similar by using the SSS and SAS Similarity Theorem? If two triangles were congruent, what would be the ratio of the corresponding sides		triangle, write the proportion. Given three parallel lines, write the proportion for the intersecting transversals Find the center of dilation Be able to determine if it is a reduction or enlargement	

What proportion can you write if a line is parallel to one side of a triangle? If three parallel lines intersect two transversals, what proportion can you write? If a ray bisects an angle of a triangle and divides the opposite side into segments, what proportion can you write? How do you dilate a figure in the coordinate plane?			
If you know the lengths of two sides of a right triangle, how do you find the length of the third side? How can you	2.1.11.A (Introduced) 2.2.11.B (Introduced) 2.2.11.C (Introduced) 2.3.11.C (Introduced)	**Right Triangles and Trigonometry - Chapter 7** ...ding logarithms). Solve problems involving similar right triangles formed by the altitude drown to the hypotenuse of a right triangle and use a geometric mean to solve problems. Demonstrate the ability to produce measures with specified le Prove the Pythagorean Theorem and use it to solve real-life problems.	...reciprocal, absolute value, rais March/April ...ems for which an exact answer is ...tical models, including lines and ...tities.

use the sides of a triangle to determine if it is right? How do you show that a line is perpendicular to a plane? How can you find the length of the altitude to the hypotenuse of a right triangle? How would you use the AA Similarity to show 2 triangles are similar? How do you find the lengths of the sides of a 30-60-90 triangle and a 45-45-90 triangle? How can you figure out which is the shorter leg in a 30-60-90 triangle?	2.9.11.D (Introduced) 2.9.11.I (Introduced)	Identify corresponding parts in congruent triangles to solve pr Use the converse of the Pythagorean Theorem to solve problems and use side lengths to classify triangles by their angle measure. Find the side lengths of special right triangles and use special right triangles to solve real-life problems Find the sine, cosine and tangent of an acute angle and use trig ratios to solve real-life problems Solve a right triangle and use right triangles to solve real-life problems	formulate and solve problem

How might you used a trigonometric ratio in real-life? What is the minimum amount of information you need to solve a right triangle?			
How do you find a missing angle measure in a convex polygon? How many exterior angles are there at each vertex of a convex polygon? How are exterior angles at the same vertex related to each other? How many ways can you prove that a quadrilateral is a parallelogram? State them.	2.4.11.A (Introduced) 2.4.11.B (Introduced) 2.5.11.A (Introduced) 2.5.11.B (Introduced) 2.9.11.C (Introduced) 2.9.11.G (Introduced)	**Quadrilaterals - Chapter 8** Identify, name, and describe polygons and use the sum of the measures of the interior and exterior angles of a quadrilateral. Use some properties of parallelograms in different types of situations Prove that a quadrilateral is a parallelogram anhd use coordinate geometry with parallelograms Use properties of sides, angles, and diagonals of rhombuses, rectangles, and squares Use properties of trapezoids and kites Identify special quadrilaterals based on limited information and prove that a quadrilateral is a special type. Find the areas of squares, rectangles, parallelograms, triangles, trapezoids, kites and rhombuses	April/May

What is true of the diagonals of a rectangle and a square but not of those of a rhombus? What is the difference between a trapezoid and a kite? What are the similarities between a parallelogram, rhombus, rectangle, square and a kite? How can you use the area of triangles and quadrilaterals?			
How can you verify that a segment is tangent to a circle? How could someone use properties of tangents in	2.5.11.B (Introduce 2.8.11.E (Introduce 2.8.11.J (Introduce 2.9.11.E (Introduce 2.9.11.F (Introduce 2.9.11.G (Introduce	**Properties of Circles - Chapter 10** Identify segments and lines related to circles and use properties of a tangent to a circle Use properties of arcs and chords of circles	May

the game of golf? How do you find the measure of an arc of a circle? How can you tell if two chords in a circle are congruent? Which is closer to the center of a circle - a longer chord or a shorter chord? How do you find the measure of an inscribed angle? If a rectangle is inscribed in a circle, what is ture about the diagonals of the rectangle? How do you find the measure of an angle		Use inscribed angles to solve problems and use properties of inscribed polygons. Use angles formed by tangents and chords to solve problems in geometry Use angles formed by lines that intersect a circle to solve problems Find the lengths of segments of chords, tangents, and secants Write the equation of a circle and use it and its graph to solve problems Draw the locus of points that satisfy a given condition Draw the locus of points that satisfy two or more conditions	

formed by 2 chords that intersect inside a circle? What do you need to know in order to write the equation of a circle in standard form? Will any point on the circle result in the same standard equation of a circle?			