New Milford's Mission Statement

The mission of the New Milford Public Schools, a collaborative partnership of students, educators, family and community, is to prepare each and every student to compete and excel in an ever-changing world, embrace challenges with vigor, respect and appreciate the worth of every human being, and contribute to society by providing effective instruction and dynamic curriculum, offering a wide range of valuable experiences, and inspiring students to pursue their dreams and aspirations.

College Prep Geometry

10/11

This course is designed for students who have demonstrated quality work in Algebra I. Topics include geometric terminology, concept of a logical deductive proof, constructions, concept of congruence, similarity, parallelism, the study of polygons and circles, and appropriate word problems. Algebraic concepts will be stressed. Calculators and/or computers will be used. A scientific calculator is required of all students in this course.

Vision of a Graduate

College Prep Geometry lends itself to focus a great deal on creativity in drawing activities that are flexible and encourage students to create a unique product and on communication skills through proof writing and questions involving written explanations. In addition, students will learn to think critically and persevere in problem solving as they learn to identify key pieces of information, label diagrams and retrieve key facts or formulas in order to solve problems.

Pacing Guide

Unit 1 Basics of Geometry	2 - 3 weeks
Unit 2 Transformations	5 - 6 weeks
Unit 3 Congruence, proof and construction	5 - 6 weeks
Unit 4 Properties of Triangles and Quadrilaterals	3 - 4 weeks
Midterm Exam - review and test	1 - 2 weeks
Unit 4 Properties of Triangles and Quadrilaterals(cont.)	2 - 3 weeks
Unit 5 Similarity and Right Triangles	5 - 6 weeks
Unit 6 Volume and Surface Area	5 - 6 weeks
Unit 7 Properties of Circles	3 - 4 weeks
Final Exam - review and test	1 - 2 weeks

Subject/Course: College Prep Geometry Unit 1: Basics of Geometry
Grade:9/10
Time frame: approx 2-3 weeks

ESTABLISHED GOALS	***Transfer***
CCSS.MATH.CONTENT.HSG.CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. CCSS.MATH.CONTENT.7SP Draw, construct and describe geometrical figures and describe the relationships between them. CCSS.MATH.CONTENT.8SP Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	*Students will be able to independently use their learning to…* 1. Model with mathematics 2. Solve problems by looking for and using rules and patterns **3.** Make sense of problems and persevere in solving them 4. Use appropriate tools strategically
	Meaning

	UNDERSTANDINGS *Students will understand that…* ● Geometric terms and notation must be used correctly to ensure accurate communication of information. ● Pairs of adjacent angles in geometric figures have specific numeric relationships ● Segment addition and angle addition theorems are important tools in solving geometric problems ● Pairs of angles formed by the intersection of a transversal with parallel lines have specific numeric relationships ● Segment length in the coordinate plane can be determined using the distance and midpoint formulas	ESSENTIAL QUESTIONS *Students will keep considering…* ● How does one express items in correct geometric terms? ● How is geometric notation used as a means of communication? ● What are the pairs of adjacent angles and what is the numeric relationship between them? ● What are the segment addition and angle addition theorems and how are they used? ● What are the pairs of angles created by a transversal intersecting parallel lines and what are their numeric relationships? ● What application do the distance and midpoint formulas have in geometric work?
	Acquisition	

	Students will know… ● Communication in geometric work is done through the use of vocabulary, markings and notations. ● That pairs of adjacent angles have specific numeric relationships ● The angle addition and segment addition theorems play an important role in solving geometric problems ● That a transversal intersecting parallel lines creates multiple angles where designated pairs have specific numeric relationships. ● That the distance and midpoint formulas can be used in calculating the lengths of segments in a coordinate plane.	*Students will be skilled at…* ● Identifying and using Geometric vocabulary ● Communicating using markings in diagrams or in notations used to identify information about the segments and angles in the diagrams. ● Calculating angle measures based on the relationship between the pairs of angles in a diagram. ● Determining the length of a segment in a coordinate plane using the distance and midpoint formula.

Code	Evaluative Criteria	Assessment Evidence
T, M, A	Evaluative Criteria consists of ● a carefully drawn diagram of the wall unit or entertainment center which includes a variety of angles. ● accurate use of vocabulary and notation to identify the geometric angles and segments within the diagram ● accurate use of numeric relationships to include segment and angle measures for the builders to use	PERFORMANCE TASK(S): **Goal**: To design a wall unit or entertainment center using lines and angles **Role**: Furniture designer **Audience**: Furniture company **Situation**: A furniture company is looking for new designs for wall units/entertainment centers to build and sell at their stores **Product**: A completed drawing of the unit with measurement specifications for the builders to use to calculate materials needed to build the unit **Standards for Success**: Scoring Rubric including focus on uniqueness of the design and accurate calculations of the angles in the diagram **Differentiation**: Scaffolding where students can create a design that is more complex and involves numerous concepts in their calculations

	Evaluative criteria consists of:	OTHER EVIDENCE:
M, A	● Is the correct vocabulary and/or notation used to identify the elements in a diagram?	● Alternative assessment projects such as a logo design activity, designing patterns or finding angle measures in existing diagrams
M, A	● Is the correct diagram created based on the given vocabulary and/or notations ?	● Review of standardized test questions to prep students for the challenge of the SAT and ACT exams
T, M, A	● Are the calculation of angles and segment lengths in a diagram accurate?	● Participation in class discussion, group work, and responses. ● Quizzes
T, M, A	● Does the design created include the required elements?	● Unit Test - to include a variety of DOK level of problems and may include SAT style problems.

Code	*Pre-Assessment*	
M	● Teacher checks for prerequisite and prior knowledge via warm-up and questioning activities, such as basic problems solving equations and identifying shapes by the correct name ● Teacher will provide review and assessment on prerequisite geometric vocabulary knowledge to ensure all students are capable of communicating effectively	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M	● Teacher review basic vocabulary and notation associated with segments, lines and angles	● Monitoring class work through board work, group work, questioning, and walk-arounds
M, A	● Students will practice communication skills by creating drawings based on given information or providing vocabulary and notation associated with a given diagram	● Check for understanding via going over homework and mediums such as reflections and exit tickets
M, A	● Teacher introduces a variety of relationships between pairs of angles and what the numeric relationship is between the pairs.	● Class worksheets with direct teacher observation or self assessment ● Practice on whiteboard/chalkboard with direct teacher observation
T, M, A	● Students will identify the relationship between angles in a diagram and then calculate the measures of angles within the diagram. .	● Kahoot quiz or pear deck slideshow with review questions and direct teacher observation
T, M, A	● Students will create patterns or designs based on given criteria and then determine the appropriate measurements	● Reflective journals or exit tickets at the end of the lesson
T, M, A	● Students complete a discovery activity on the pairs of angles created by a transversal intersecting parallel lines. As part of the activity, the students will identify the numeric relationship between the pairs of angles.	● Google form/google slide review assignments ● Homework assignments with direct teacher observation or self assessment

M, A M, A T, M, A T, M, A	● Students practice solving for angles within parallel lines. ● Teacher introduces the concepts of segment addition and angle addition. ● Students will solve problems using the segment and angle addition theorems ● Students complete problems involving applications of segment and pairs of angles **Suggested Resources and supplies** Resources: All Resources and materials must adhere to all New Milford Board of Education policies and regulations and are subject to New Milford Board of Education approval. Resources and materials must be researched and vetted by the writers and department heads prior to submission for approval. ● Textbook: Bass, Laurie, et.al. . *Geometry Common Core.* 1st ed. Upper Saddle River, NJ: Pearson, Prentice Hall, 2012. Print. ● Resource materials provided by Pearson such as implementing the common core, differentiation and standardized test practice ● Resource from the Bureau of Education and Research: *Strengthening your geometry program: Ideas, strategies and hands-on activities* ● Geogebra; interactive application: Hohenwarter, Markus ● Kahoot; interactive game: Wiggins and Murphy ● Geometer's Sketchpad; interactive application: KCP Technologies	● Projects/performance tasks modeling real world problems involving all aspects of transformations and symmetry ● Summative assessments Quizzes Unit test

	● Desmos; advanced graphing calculator ● Google forms and Google slides with pear deck extension ● Supplies: white boards, straight edge, graph paper, colored pencils	

Subject/Course: College Prep Geometry Unit: 2 Transformations
Grade:9/10
Time frame: approx 5-6 weeks

ESTABLISHED GOALS	***Transfer***
CCSS.MATH.CONTENT.HSG.CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. CCSS.MATH.CONTENT.HSG.CO.A.2 Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch). CCSS.MATH.CONTENT.HSG.CO.A.5	*Students will be able to independently use their learning to…* 1. Create graphic representations of data 2. Model with functions to make sense of a pattern 3. Solve problems by looking for and using rules and patterns 4. Make sense of problems and persevere in solving them ***Meaning***

Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	UNDERSTANDINGS *Students will understand that…* ● Geometric terms and notation must be used correctly to ensure accurate communication of information. ● Functions can be used to change a figure's position and/or size. ● Functions can be used to represent a transformation in the coordinate plane. ● Dilations have a direct relation to similarity and scale factors between figures ● Transformations can be created using a variety of tools, including technology, ● Dilations have a center and a radius	ESSENTIAL QUESTIONS *Students will keep considering…* ● How does one express items in correct geometric terms? ● How can one change a figure's position without changing its size and shape? ● How can one change a figure's size without changing its shape? ● How can one represent a transformation in the coordinate plane? ● How can one recognize congruence and similarity in figures? ● How can transformations be used to create designs and tessellations? ● How can transformations describe a change in the position of an object? ● What are the properties of a figure preserved during a dilation? ● How are dilations related to similar figures and their scale factors
	Acquisition	

	Students will know… ● A transformation of a geometric figure is a change in its position, shape, or size. ● Some transformations preserve distance and angles while some do not. ● A transformation can be represented as a function ● A transformation can be created using a variety of mediums. ● Similar figures are a direct result of a dilation and the scale factor used to create the dilation	*Students will be skilled at…* ● Identifying and using Geometric vocabulary ● Observing patterns and developing definitions of reflections, rotations, and translations. ● Using geometric software and/or manipulatives to model and compare transformations. ● Demonstrating a sequence of transformations that will carry a figure onto another. ● Showing graphic representation of data ● Determining the scale factor of similar figures created by a dilation

STAGE 2

Code	Evaluative Criteria	Assessment Evidence
T, M, A	Evaluative Criteria consists of ● an explanation of which transformations were used to design the pattern. ● accurate use of the transformation to create the pattern ● a final design that holds to the definition of a tessellation	PERFORMANCE TASK(S): **Goal**: To design a wallpaper pattern using tessellations **Role**: Interior Designer **Audience**: Hotel Manager **Situation**: The manager of a hotel wants to redesign the lobby and has hired an interior designer to make a new geometric wallpaper pattern. **Product**: A completed tessellation design **Standards for Success**: Scoring Rubric including focus on color, size and production of a tessellatable shape **Differentiation**: Scaffolding where students can create a design from a simple transformation and basic coloring pattern or a more complex transformation and more sophisticated coloring scheme.

	Evaluative criteria consists of:	OTHER EVIDENCE:
M, A	● Is the correct transformation created based on the vocabulary and/or function notation?	● Alternative assessment projects such as a logo design activity, graphing transformations on the coordinate plane, dilations with similar figures and designing patterns
M, A	● Is the correct vocabulary and/or notations used to represent a given transformation?	● Review of standardized test questions to prep students for the challenge of the SAT and ACT exams
T, M, A	● Are the appropriate transformations chosen for a specific application?	● Participation in class discussion, group work, and responses.
T, M, A	● Does the transformation model the desired application?	● Quizzes ● Unit Test - to include a variety of DOK level of problems and may include SAT style problems.

Code	*Pre-Assessment*	
M	● Teacher checks for prerequisite and prior knowledge via warm-up and questioning activities, such as basic problems on graphing vertical and horizontal lines and writing equations ● Prerequisite knowledge is reinforced through algebra review assignments ● Teacher will provide review and assessment on prerequisite geometric vocabulary knowledge to ensure all students are capable of communicating effectively	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M	● Teacher introduces vocabulary and notation associated with translations, reflections, rotations and dilations.	● Monitoring class work through board work, group work, questioning, and walk-arounds
T, M, A	● Teacher demonstrates a variety of methods on how to complete an actual transformation using translations, reflections, rotations and dilations.	● Check for understanding via going over homework and mediums such as reflections and exit tickets
T, M, A	● Students use a variety of methods to complete transformations on worksheets, whiteboards and graph paper .	● Class worksheets with direct teacher observation or self assessment ● Practice on whiteboard/chalkboard with direct teacher observation
M, A	● Students will observe patterns and develop definitions of reflections, rotations, translations and dilations	● Kahoot quiz or pear deck slideshow with review questions and direct teacher observation
T, M, A	● Students will complete a project where they create an original shape and complete each of the 4 transformations on that shape	● Reflective journals or exit tickets at the end of the lesson
M, A	● Teacher expands upon their understanding of transformations by examining similar figures and their scale factors.	● Google form/google slide show review assignments
M, A	● Students will examine similar figures created by dilations and calculate scale factors that can be used to find missing lengths	● Homework assignments with direct teacher observation or self assessment

M, A T, M, A T, M, A	● Teacher introduces the concepts of symmetry and demonstrates them with physical models. ● Students will identify the symmetry associated with a variety of figures ● Students will create a shape that tessellates and use it to make a tessellation picture on paper.	● Projects/performance tasks modeling real world problems involving all aspects of transformations and symmetry ● Summative assessments Quizzes Unit test

Suggested Resources and supplies

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- Textbook: Bass, Laurie, et.al. . *Geometry Common Core.* 1st ed. Upper Saddle River, NJ: Pearson, Prentice Hall, 2012. Print.
- Resource materials provided by Pearson such as implementing the common core, differentiation and standardized test practice
- Resource from the Bureau of Education and Research: *Strengthening your geometry program: Ideas, strategies and hands-on activities*
- Geogebra; interactive application: Hohenwarter, Markus
- Kahoot; interactive game: Wiggins and Murphy
- Geometer's Sketchpad; interactive application: KCP Technologies
- Desmos; advanced graphing calculator

	● Google forms and Google slides with pear deck extension ● Supplies: Patty paper, white boards, straight edge, graph paper, colored pencils	

Subject/Course: College Prep Geometry Unit 3: Congruence, Proof and Construction
Grade:9/10
Time frame: approx. 5-6 weeks

<table>
<tr><td rowspan="4">ESTABLISHED GOALS

<u>CCSS.Math.Content.HSG.CO.B.7</u>
Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
<u>CCSS.Math.Content.HSG.CO.B.8</u>
Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
<u>CCSS.Math.Content.HSG.CO.B.6</u>
Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.</td><td colspan="2">Transfer</td></tr>
<tr><td colspan="2">Students will be able to independently use their learning to…

● Support ideas clearly and concisely using proper mathematical language/notation.
● Construct viable arguments involving mathematics and critique the reasoning of others.
● Make sense of problems and persevere in solving them</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td>UNDERSTANDINGS
Students will understand that…

● Congruent figures have the same size and shape.
● Orientation of a triangle is not necessary for congruence if the corresponding parts are congruent.
● Angle relationships exist when parallel lines are intersected by a transversal.
● Geometric configurations can be constructed through the use of a variety of tools including technology
● Proof is the highest level of mathematical argument.
● Triangle congruence can be proven using geometric theorems</td><td>ESSENTIAL QUESTIONS
Students will keep considering…

● How does one know if triangles are congruent?
● What effect do rotations have on the congruence criteria?
● How does one use criteria to prove congruence?
● How can one find the measure of special angle pairs given parallel lines?
● How does one perform a geometric construction?
● How does one formulate a proof?</td></tr>
</table>

	Acquisition	
	Students will know… ● Vocabulary: triangle, acute, obtuse, right, isosceles, scalene, equilateral, equiangular, interior angle, exterior angle ● The criteria used to prove triangles congruent (SAS, ASA, AAS, SSS and HL) ● That as a result of triangles being proven congruent, additional corresponding parts can identified as congruent(CPCTC) ● Vertical angles and the reflexive property play an important role in proving triangles congruent. ● The four special segments in triangles: median, altitude, angle bisector, perpendicular bisector.. ● Constructions can be made to identify a locus of points	*Students will be skilled at…* ● Identifying which theorem can be used to prove or disprove triangles congruent. ● Creating basic constructions for bisectors and congruent figures ● Proving and applying theorems about angles ● Using and applying the vertical angles theorem ● Identifying special angle pairs and relationships given two lines and a transversal ● Constructing basic geometric figures including but not limited to : congruent angles, bisectors, parallel and perpendicular lines

STAGE 2

Code	Evaluative Criteria	Assessment Evidence
T, M, A	Further information: Evaluative Criteria consists of: ● comprehensive explanation of corrections ● accurate use of mathematical concepts ● use of appropriate proof structure ● accurate completion of all tasks	PERFORMANCE TASK(S): **Goal**: To demonstrate how to communicate clearly using the medium of mathematical proof by correcting student mistakes **Role**: Teacher **Audience**: Student **Situation**: Students will be given incorrect proofs. It will be their job to correct the mistakes and provide feedback. **Product**: A completed worksheet with corrections clearly labeled with explanation. **Standards for Success**: Rubric based on understanding of different styles of proof **Differentiation:** Students will be able to choose from a variety of styles and difficulty level of proofs.

	Evaluative criteria consists of:	OTHER EVIDENCE:
M , A	● Is there a clear understanding of vocabulary in terms of the connection to congruences when comparing geometric shapes?	● Alternative assessment projects such as a group proof activities, finding the mistake exercises or constructions involving real world criteria
M, A	● Is there a clear understanding of the format of a proof?	● Review of standardized test questions to prep students for the challenge of the SAT and ACT exams
T, M, A	● Do the steps in the proof follow a logical order?	● Participation in class discussion, group work, and responses.
T, M, A	● Has a clear understanding of the purpose and outcome of the proof been communicated?	● Quizzes
M, A	● Are the correct steps followed in making a construction?	● Unit Test - to include a variety of DOK level of problems and may include SAT style problems.
T, M, A	● Does a construction accurately depict the desired outcome of a real-world application?	

Code	***Pre-Assessment***
M	● Teacher checks for prerequisite and prior knowledge via warm-up and questioning activities, such as basic problems on geometric vocabulary as marked within a diagram ● Prerequisite knowledge is reinforced through algebra review assignments ● Teacher will provide review and assessment on prerequisite geometric vocabulary knowledge to ensure all students are capable of communicating effectively

	Summary of Key Learning Events and Instruction	Progress Monitoring
M, A	● Teacher will introduce the methods of proof: statement/reason, flowchart and paragraph using prior knowledge on algebraic and geometric terms	● Monitoring class work through board work, group work, questioning, and walk-arounds ● Check for understanding via going over homework and mediums such as reflections and exit tickets ● Class worksheets with direct teacher observation or self assessment ● Practice on whiteboard/chalkboard with direct teacher observation ● Kahoot quiz or pear deck slideshow with review questions and direct teacher observation ● Reflective journals or exit tickets at the end of the lesson ● Google form/google slide show review assignments ● Homework assignments with direct teacher observation or self assessment ● Projects/performance tasks modeling real world problems involving all aspects of proofs and constructions ● Summative assessments Quizzes Unit test
M, A	● Teacher will introduce the methods that do and do not prove triangles congruent.	
T, M, A	● Students will complete proofs, using each method, to demonstrate their understanding of the logical sequence of steps and knowledge of vocabulary	
M, A	● Teacher reviews vocabulary and guides students in basic constructions of bisectors, perpendiculars, congruent figures.	
T, M, A	● Students will apply their knowledge of vocabulary and constructions to constructions of parallel lines, isosceles and equilateral triangles and rectangles.	
T, M, A	● Students will use constructions to accurately depict solutions to real world situations	

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Subject/Course: College Prep Geometry Unit: 4 Triangles and Quadrilaterals
Grade:9/10
Time frame: approx. 3-4 weeks

<table>
<tr><td rowspan="4">ESTABLISHED GOALS

<u>CCSS.Math.Content.HSG.CO.C.11</u>
Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

<u>CCSS.Math.Content.HSG.CO.C.10</u>

Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles</td><td colspan="2">Transfer</td></tr>
<tr><td colspan="2">Students will be able to independently use their learning to…

● Work carefully to solve the problem and verify that calculations are accurate and solutions are reasonable.
● Solve problems by looking for and using rules, patterns, and experience with similar problems.
● Make sense of problems and persevere in solving them</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td>UNDERSTANDINGS

● Special properties apply to isosceles and equilateral triangles
● Special segments in triangles exhibit specific properties in the real world.
● Points of concurrency exist in all triangles as a result of the intersection of the special segments</td><td>ESSENTIAL QUESTIONS

● What distinguishes isosceles and equilateral triangles from other triangles?
● What are the special segments in triangles?
● How do the properties of the points of concurrency in a triangle relate to the real world?</td></tr>
</table>

are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point. CCSS.Math.Content.HSG.SRT.B.4 Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.* *CCSS.Math.Content.HSG.SRT.B.5* Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	• Two sides of a triangle must have a sum larger than the third. • Properties of parallelograms work from specific (square) to general (parallelogram). • Parallelograms use properties of parallel lines. • Quadrilaterals can be determined through the slope and distance formula. • Squares are rectangles, but a rectangle is not necessarily a square. • Trapezoids and kites are special quadrilaterals which do not have the properties of parallelograms • Interior and exterior angles in polygons can be calculated using specific formulas	• What distinguishes the types of quadrilaterals? • How can we prove which quadrilateral we have? • What are the properties of a trapezoid and kite, which separate it from a parallelogram? • How are the interior and exterior angles in polygons calculated?
	Acquisition	
	Students will know… • Triangles can be broken into the more specific classifications: acute, obtuse, right, isosceles, scalene, equilateral, equiangular, and regular. • The specific properties of each triangle • The sum of interior angles in a triangle is 180 degrees. • The four special segments in triangles: median, altitude, angle bisector, perpendicular bisector. • Points of concurrency created by these special segments have real world applications	*Students will be skilled at…* • Identifying congruent angles and sides in an isosceles or equilateral triangle. • Applying properties of special segments in triangles to problems using algebraic thinking. • Calculating the length of a midsegment in a triangle. • Finding the missing angle measures in a triangle. • Using and applying Polygon Angle Sum Theorem. • Using and applying Exterior Angle Theorem

	● The triangle inequality theorem states that the sum of any two sides must be longer than the third. ● The longest side in a triangle is across from the largest angle and the shortest side is across from the smallest angle. ● Quadrilaterals can be broken into the more specific classifications of: parallelograms, rectangles, rhombus, square, trapezoid and kite. ● The specific properties of each quadrilateral ● The properties of midsegments in triangles and trapezoids ● Polygons have interior and exterior angles that can be calculated using specific formulas	● Proving the type of quadrilateral given information about the angles and sides. ● Showing the type of parallelogram by calculating slope and distance. ● Identifying the classification of parallelograms given the angle and side measurements. ● Giving a specific quadrilateral and coordinates (as variables) identify any missing coordinates (as variables). ● Applying properties of quadrilaterals to real-world problems. ● Calculating the interior and exterior angles in polygons

STAGE 2

Code	Evaluative Criteria	Assessment Evidence
T, M, A	Evaluative Criteria consists of: ● accurate use of mathematical concepts ● identification of the appropriate number of triangles and how to connect them ● correct method for construction the triangles ● final hexagon carefully pieces together	PERFORMANCE TASK(S): **Goal**: To use knowledge of triangle properties to create a hexagonal piece for a quilt. **Role**: Designer **Audience**: Owner of a textile company **Situation**: The owner of the company is looking to make quilts using hexagonal pieces created by combining a series of equilateral and isosceles triangles **Product**: A hexagonal quilt piece comprised of numerous triangles **Standards for Success**: Rubric based on knowledge of points of concurrency and constructions. **Differentiation**: Students will have the option to choose their own design and color scheme

	Evaluative criteria consists of:	OTHER EVIDENCE:
M, A T, M, A M, A T, M. A M, A T, M, A	● Is the triangle identified correctly using the given properties? ● Are the correct properties applied based on the given triangle? ● Is the quadrilateral correctly identified using the given properties? ● Are the correct properties applied based on the given quadrilateral? ● Are the calculations accurate based on the desired outcome? ● Is the correct property and calculation identified for use on a real world application?	● Alternative assessment projects such as a group proof activities, finding the mistake exercises or constructions involving real world criteria ● Review of standardized test questions to prep students for the challenge of the SAT and ACT exams ● Participation in class discussion, group work, and responses. ● Quizzes ● Unit Test - to include a variety of DOK level of problems and may include SAT style problems.

Code	***Pre-Assessment***	
M	● Teacher checks for prerequisite and prior knowledge via warm-up and questioning activities, such as basic problems on solving equations,order of operations and substitution ● Prerequisite knowledge is reinforced through algebra review assignments ● Teacher will provide review and assessment on prerequisite geometric vocabulary knowledge to ensure all students are capable of communicating effectively	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M, A	● Teacher will guide students through a review of prior knowledge on triangles including median, altitude, perpendicular bisector and angle bisector	● Monitoring class work through board work, group work, questioning, and walk-arounds
M, A	● Teacher will introduce properties of triangles: sum of interior angles, exterior angle theorem, isosceles triangles, triangle inequality theorem, and longest/shortest side relationship to smallest/largest angle	● Check for understanding via going over homework and mediums such as reflections and exit tickets ● Class worksheets with direct teacher observation or self assessment
T, M, A	● Student knowledge will be reinforced through a discovery lesson using linguini and measuring activities	● Practice on whiteboard/chalkboard with direct teacher observation
T, M, A	● Students will apply knowledge of vocabulary and properties of triangles on class practice with direct monitoring from the teacher	● Kahoot quiz or pear deck slideshow with review questions and direct teacher observation
M, A	● Teacher will introduce the vocabulary associated with points of concurrency	● Reflective journals or exit tickets at the end of the lesson
T, M, A	● Students will demonstrate their understanding of points of concurrency through a construction project requiring application of content to specific scenarios.	● Google form/google slide show review assignments ● Homework assignments with direct teacher

M, A	● Teacher will guide students through a review of prior knowledge on quadrilaterals	observation or self assessment ● Projects/performance tasks modeling real world problems involving all aspects of proofs and constructions ● Summative assessments Quizzes Unit test
M, A	● Teacher will introduce the family tree of quadrilaterals.	
T, M, A	● Students will apply knowledge of vocabulary and properties of quadrilaterals on class practice with direct monitoring from the teacher	
T, M, A	● Students will demonstrate understanding of vocabulary and properties of triangles and quadrilaterals through construction activities involving equilateral and isosceles triangles, squares, rectangles, rhombus, and parallelograms.	
M, A	● Students will use a discovery lesson to determine the polygon angle sum theorem	
T, M, A	● Students will apply their knowledge of interior and exterior angles to application problems with direct monitoring from the teacher	
	Suggested Resources and supplies All Resources and materials must adhere to all New Milford Board of Education policies and regulations and are subject to New Milford Board of Education approval. Resources and materials must be researched and vetted by the writers and department heads prior to submission for approval.	

	● Textbook: Bass, Laurie, et.al. . *Geometry Common Core.* 1st ed. Upper Saddle River, NJ: Pearson, Prentice Hall, 2012. Print. ● Resource materials provided by Pearson such as implementing the common core, differentiation and standardized test practice ● Resource from the Bureau of Education and Research: *Strengthening your geometry program: Ideas, strategies and hands-on activities* ● Geogebra; interactive application: Hohenwarter, Markus ● Kahoot; interactive game: Wiggins and Murphy ● Geometer's Sketchpad; interactive application: KCP Technologies ● Desmos; advanced graphing calculator ● Google forms and Google slides with pear deck extension ● Supplies: Patty paper, compass, protractor, straight edge, graph paper, colored pencils, linguini	

Subject/Course: College Prep Geometry Unit: 5 Similarity, Right triangles and Trigonometry
Grade:9/10
Time frame: approx 5 - 6 weeks

<table>
<tr><td rowspan="3">ESTABLISHED GOALS

CCSS.Math.Content.HSG.SRT.A.2
Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
CCSS.Math.Content.HSG.SRT.C.6

Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

CCSS.Math.Content.HSG.SRT.C.8</td><td colspan="2">Transfer</td></tr>
<tr><td colspan="2">Students will be able to independently use their learning to…

● Work carefully to solve the problem and verify that calculations are accurate and solutions are reasonable.
● Solve problems by looking for and using rules, patterns, and experience with similar problems.
● Make sense of problems and persevere in solving them</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td>UNDERSTANDINGS
Students will understand that…

● Similarity refers to any objects which have the same shape.
● Ratio and proportion can be used often to find missing sides in similar figures.
● Sides and angles in a right triangle can be calculated using several different methods.
● Classification of a triangle as acute, right or obtuse can be found using the pythagorean theorem.</td><td>ESSENTIAL QUESTIONS
Students will keep considering…

● How can we show two triangles are similar?
● How can we identify corresponding parts of similar triangles?
● How can we find the length of the side in a right triangle without Pythagorean theorem?
● How can the Pythagorean theorem determine the classification of a triangle</td></tr>
</table>

Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. CCSS.Math.Content.HSG.GPE.A.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. CCSS.MATH.CONTENT.HSG.SRT.A.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar	• Special right triangles have formulas to identify exact values for side lengths • Ratios are used in all right triangles using the sine, cosine or tangent of an angle. • Sine and cosine of complementary angles are congruent. • Angles of elevation and depression are angles formed above and below a horizontal plane.	• How can we find the missing parts of a right triangle? • How can we use ratios to find missing parts of triangles? • How do we apply the shortcuts for special right triangles? • How do trigonometric ratios relate to similar right triangles? • What is the difference between an angle of elevation and an angle of depression?
	Acquisition	
	Students will know… • Vocabulary: Right Triangle, Hypotenuse, Adjacent Leg, Opposite Leg. • Ratios are used to find missing parts of similar figures. • Similar figures are the same shape but not necessarily the same size. • Similar figures may be congruent, but congruent figures are always similar. • The shortcuts for similarity are AA, SAS, SSS • 30-60-90 and 45-45-90 are the most common configurations of right triangles. • Using the Pythagorean Theorem we can prove shortcuts to find exact lengths of sides for special right triangles. • Sine and Cosine of complementary angles are congruent . • Trigonometric ratios can be used to find a missing length or angle measure in a triangle	*Students will be skilled at…* • Using trigonometry to find a missing side or missing angle in a right triangle. • Using special right triangles, find the exact value of a side in a right triangle • Applying similarity to find the length of real-world objects like the height of an outdoor flagpole. • Proving similarity in triangles with the AA similarity criterion. • Applying the Pythagorean Theorem and its converse to triangles • Using the rules for special triangles to find coordinates of the unit circle • Applying the sine, cosine and tangent ratios to real-world application problems. • Classifying and solving problems involving angles of elevation and depression

STAGE 2

Code	Evaluative Criteria	Assessment Evidence
T, M, A	Evaluative Criteria consists of: ● accurate use of mathematical concepts ● identification of one of the appropriate methods for the calculation ● precise measurements and calculations ● complete explanation of final result	PERFORMANCE TASK(S): **Goal**: Calculate the height of the flagpole outside the high school **Role**: Engineer **Audience**: Board of Education **Situation**: The Board of Education would like to purchase a new flagpole and would like to know the height of the current flagpole. **Product**: Work shown with diagram and written summary about which size pole to purchase **Standards for Success**: Rubric based on the method of calculation and accuracy of solution **Differentiation:** Students will be able to choose which mathematical method they would like to use to complete the task.

T, M, A M, A M, A M, A T, M, A	Evaluative criteria consists of: ● Is the information provided clearly diagramed and labeled? ● Is the appropriate method chosen for finding a missing side or angle based on the data provided? ● Are the calculations accurate? ● Is the correct trigonometric ratio used to solve for the missing side or angle? ● Are the answers to a real world problem clearly communicated?	OTHER EVIDENCE: ● Alternative assessment projects such as proving quadrilaterals based on properties, designs created by constructing specific triangles and quadrilaterals and finding angle measures in complex and real world pictures. ● Review of standardized test questions to prep students for the challenge of the SAT and ACT exams ● Participation in class discussion, group work, and responses. ● Quizzes ● Unit Test - to include a variety of DOK level of problems and may include SAT style problems.

Code	***Pre-Assessment***	
M	● Teacher checks for prerequisite and prior knowledge via warm-up and questioning activities, such as basic problems on cross multiplication, simplifying radicals and solving equations ● Prerequisite knowledge is reinforced through algebra review assignments ● Teacher will provide review and assessment on prerequisite geometric vocabulary knowledge to ensure all students are capable of communicating effectively	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M, A	● Teacher will guide students through a review of prior knowledge on Corresponding Angles, Corresponding Sides, Congruence Statements,and Scale Factor (Similarity Ratio)	● Monitoring class work through board work, group work, questioning, and walk-arounds
M, A	● Teacher will introduce new vocabulary: Right Triangle, Hypotenuse, Adjacent Leg, Opposite Leg, Trigonometric Ratios, Angle of Elevation, Angle of Depression	● Check for understanding via going over homework and mediums such as reflections and exit tickets
T, M, A	● Students will demonstrate their understanding of the vocabulary on class practice with direct monitoring from the teacher	● Class worksheets with direct teacher observation or self assessment ● Practice on whiteboard/chalkboard with direct teacher observation
M, A	● Teacher will introduce triangle similarity using AA, SAS, and SSS similarity criterion.	● Kahoot quiz or pear deck slideshow with review questions and direct teacher observation
T, M, A	● Teacher will guide students through a review of prior knowledge of the pythagorean theorem and its applications.	● Reflective journals or exit tickets at the end of the lesson
T, M, A	● Teacher will derive the formulas for special triangles using the pythagorean theorem.	● Google form/google slide show review assignments

M, A	• Teacher will introduce trigonometric ratios and SOHCAHTOA to find a missing side or missing angle in a right triangle.	• Homework assignments with direct teacher observation or self assessment
T, M, A	• Students will apply knowledge of similarity, pythagorean theorem and trigonometry to real applications with direct monitoring from the teacher and peer and self assessment	• Projects/performance tasks modeling real world problems involving all aspects of proofs and constructions
T, M, A	• Students will apply their knowledge from this unit to choose an appropriate method to find the height of the flagpole in front of the school.	• Summative assessments Quizzes Unit test

Suggested Resources and supplies

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- Resource materials provided by Pearson such as implementing the common core, differentiation and standardized test practice
- Resource from the Bureau of Education and Research: *Strengthening your geometry program: Ideas, strategies and hands-on activities*
- Geogebra; interactive application: Hohenwarter, Markus
- Kahoot; interactive game: Wiggins and Murphy
- Geometer's Sketchpad; interactive application: KCP Technologies

	● Desmos; advanced graphing calculator ● Google forms and Google slides with pear deck extension ● Supplies: white boards, straight edge, graph paper, colored pencils, clinometer, measuring tape	

Subject/Course: College Prep Geometry Unit: 6 Area, Surface Area and Volume
Grade:9/10
Time frame: approx 5-6 weeks

ESTABLISHED GOALS

CCSS.Math.Content.HSG.GMD.A.3
Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*

CCSS.Math.Content.HSG.GMD.B.4

Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

CCSS.Math.Content.HSG.MG.A.2

Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).*

Transfer

Students will be able to independently use their learning to…

- Work carefully to solve the problem and verify that calculations are accurate and solutions are reasonable.
- Solve problems by looking for and using rules, patterns, and experience with similar problems.
- Make sense of problems and persevere in solving them

Meaning

UNDERSTANDINGS
Students will understand that…

- Solids can be named by the shape of their base and the shape of their lateral faces.
- Surface area is used to determine how much material is needed to cover a figure and the result is given in square units.
- Volume is used to determine how much material will fill an object and the result is given in cubic units.

ESSENTIAL QUESTIONS
Students will keep considering…

- How do we identify a solid?
- How can we locate the base or height of a solid?
- How can we calculate the surface area and volume of a solid?
- When do we use surface area and when do we use volume?
- How can we derive the formulas for volume from the area formulas?
- How is the cross section of a shape used in calculating surface area and volume?

	● Bases of a prism can be found by identifying the non-rectangular parallel faces of the solid (with the exception of a rectangular prism). ● Base of a pyramid can be found by identifying the non triangular face of the solid (with the exception of a triangular pyramid) ● Slant height of a shape is different than the actual height ● Units which are reported in an answer are critical to the accuracy of an answer. ● Cross section is the intersection of a solid and a plane. ● Area and volume calculations are utilized in numerous career fields	● How are area and volume used in real life career fields? ● Why are units important to the accuracy of an answer? ● What is the purpose of the cross section of a solid? ● How does the slant height differ from the actual height of a solid?
	Acquisition	
	Students will know… ● The Formulas for area of two-dimensional figures. ● Vocabulary: Polyhedron, prism, pyramid, cylinder, cone, sphere, hemisphere, height, base, apothem, slant height, lateral area, surface area, volume, face, lateral face, edge, vertex, side, cross section, oblique, great circle. ● The relationship between volume of pyramids and prisms as well as cylinders and cones. ● The cross section of a solid can be used to calculate surface area and volume	*Students will be skilled at…* ● Applying the formulas for surface area and volume to prisms, pyramids, cylinders, and spheres. ● Relating cross sections to the calculations of surface area and volume. ● Applying the formulas for areas of two-dimensional figures including quadrilaterals, triangles, polygons, etc. ● Finding missing measures including, but not limited to, slant height, height of the solid, lateral edges, radius, etc. ● Transforming an expression from one unit to another (ex. ft per sec to yds per hr) ● Using and applying the formulas for circumference and area of a circle.. .

	• The difference between slant height and the height of a solid	• Applying concepts of density based on area and volume in modeling situations.

STAGE 2

Code	Evaluative Criteria	Assessment Evidence

T, M, A	Evaluative Criteria consists of: ● Accurate use of mathematical concepts ● Identification of the appropriate formula for each shape ● Precise measurements and calculations ● Complete explanation of final results	PERFORMANCE TASK(S): **Goal**: Find the surface area and volume of various solids that are used in the manufacturing industry **Role**: Employee at a Manufacturing Company **Audience**: Client **Situation**: Manufacturer must calculate the surface area and volume of various three-dimensional objects for packaging purposes **Product**: Work/Calculations and conclusion about which solid to choose for shipping specific items. Many justifiable answers. **Standards for Success**: Rubric based on accurate data collection and presentation of conclusions. **Differentiation:** Students will work hands-on with 3-dimensional shapes that require the use of basic and familiar area and volume formulas as well as the option to work with shapes that require the use of more complex formulas and calculations.

	Evaluative criteria consists of:	OTHER EVIDENCE:
T, M, A	● Is the correct calculation(i.e. area, surface area or volume) used to solve the problem.	● Alternative assessment projects such as labs involving measuring and calculating volumes and surface areas of real objects, questioning activities that identify which measurement is the appropriate calculation for each problem and applications involving real world volume and surface area calculations.
M, A	● Is the correct solid and corresponding formula identified for use in solving the problem?	
M, A	● Are all values been measured accurately	● Review of standardized test questions to prep students for the challenge of the SAT and ACT exams
M,A	● Is the solution the result of accurate substitution and calculation	● Participation in class discussion, group work, and responses.
M,A	● Is the solution labeled with the correct units	● Quizzes
T, M,A	● Are the answers to a real world problem clearly communicated?	● Unit Test - to include a variety of DOK level of problems and may include SAT style problems.

Code	***Pre-Assessment***
M	● Teacher checks for prerequisite and prior knowledge via warm-up and questioning activities, such as basic problems on substitution, order of operations, solving equations and identification of basic shapes ● Prerequisite knowledge is reinforced through algebra review assignments ● Teacher will provide review and assessment on prerequisite geometric vocabulary knowledge to ensure all students are capable of communicating effectively

	Summary of Key Learning Events and Instruction	Progress Monitoring
M, A	● Teacher will guide students through a review of prior knowledge on area formulas	● Monitoring class work through board work, group work, questioning, and walk-arounds
M, A	● Teacher will introduce and demonstrate the concepts of cross sections and solids of revolutions and relate them to the calculation of volume and surface area	● Check for understanding via going over homework and mediums such as reflections and exit tickets
M, A	● Teacher will guide students through a review of prior knowledge on surface area, both by formula and the sum of individual sides	● Class worksheets with direct teacher observation or self assessment
M, A	● Teacher will guide the students through a demonstration of the volume of pyramids and cones as they relate to prisms and cylinders and will acknowledge the formulas for each shape	● Practice on whiteboard/chalkboard with direct teacher observation
T, M, A	● Students will practice measuring skills by calculating the surface area and volume for a wide range of three-dimensional solids. This will be in a laboratory format.	● Kahoot quiz or pear deck slideshow with review questions and direct teacher observation
T, M, A	● Teacher will brainstorm with students how to determine if a problem is asking for area, surface area and volume.	● Reflective journals or exit tickets at the end of the lesson
T, M, A	● Teacher will have students work in groups to create and solve their own application problems for surface area and volume	● Google form/google slide show review assignments
T, M, A	● Students will explore various occupations that use these formulas and perform some of the calculations.	● Homework assignments with direct teacher observation or self assessment
T, M, A		● Projects/performance tasks modeling real world problems involving all aspects of proofs and constructions
		● Summative assessments Quizzes Unit test

- Students will work in groups to “think, pair, and share” results about the relationship between scale factors, areas, and volumes of similar solids.

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- Geogebra; interactive application: Hohenwarter, Markus
- Kahoot; interactive game: Wiggins and Murphy
- Geometer’s Sketchpad; interactive application: KCP Technologies
- Desmos; advanced graphing calculator
- Google forms and Google slides with pear deck extension
- Supplies: white boards, rulers, colored pencils, 2-d and 3-d shapes, manipulatives for cross sections and solids of rotation.

Subject/Course: College Prep Geometry Unit: 7 Circles
Grade:9/10
Time frame: approx 5-6 weeks

<table>
<tr><td rowspan="4">ESTABLISHED GOALS

<u>CCSS.Math.Content.HSG.C.A.2</u>
Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
<u>CCSS.MATH.CONTENT.HSG.C.A.1</u>
Prove that all circles are similar

<u>CCSS.MATH.CONTENT.HSG.C.A.3</u>

Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.</td><td colspan="2">Transfer</td></tr>
<tr><td colspan="2">Students will be able to independently use their learning to…

● Work carefully to solve the problem and verify that calculations are accurate and solutions are reasonable.
● Solve problems by looking for and using rules, patterns, and experience with similar problems.
● Make sense of problems and persevere in solving them</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td>UNDERSTANDINGS
Students will understand that…

● A circle is the set of all points equidistant from the center.
● Arcs and angles are closely related but the notation is different.
● Area of a sector is a fractional piece of the area of the entire circle.
● Central angles and inscribed angles will have different sized arcs.
● Arc length is a fractional piece of the circumference.</td><td>ESSENTIAL QUESTIONS
Students will keep considering…

● What are the key terms for a circle?
● How are arc measure and angle measure related?
● How does one measure arc length and how is it related to the circumference of a circle?
● How can segment lengths be calculated using properties of tangents, secants and chords</td></tr>
</table>

	● Properties of tangents, secants and chords can be used to determine segment lengths in circles ● Tangents and radii meet at right angles ● Chords that are bisected by a diameter are also perpendicular	● How a right angle is formed by a tangent and radius ● How does a diameter that is a perpendicular bisector of a chord create a right triangle within a diagram?
	Acquisition	
	Students will know… ● Vocabulary: Circle, Radius, Diameter, Chord, Arc, Sector, Angle, Intercepted Arc, Inscribed Angle, Central Angle, tangent, secant. ● Inscribed Angle measures are half the measure of the arc. ● Central Angle measures are equal to the measure of the arc. ● Segment lengths in circles can be found using the properties of tangents, secants and chords ● Right angles are formed by a tangent and radius ● Perpendicular bisectors of a chord create right angles	*Students will be skilled at…* ● Calculating measure of an arc. ● Calculating measure of an interior angle. ● Calculating measure of an inscribed angle. ● Calculating the arc length. ● Calculating the area of a sector. ● Calculating segment lengths within in circles ● Applying calculations to real-world problems

STAGE 2

Code	Evaluative Criteria	Assessment Evidence

T, M, A	Evaluative Criteria consists of: ● accurate use of mathematical concepts ● identification of the appropriate term and formula for each computation ● precise measurements and calculations ● complete explanation of final results	PERFORMANCE TASK(S): **Goal**: To calculate the measures of lines, sectors and angles used to build a miniature toy ferris wheel. **Role**: Architect **Audience**: Manager of a toy company **Situation**: Use the properties of circles, tangents and chords to calculate the measure of the beams used to design a miniature ferris wheel and the angles at which they will need to be connected. **Product**: Calculated distances and angle measures for building a miniature toy ferris wheel. **Standards for Success**: Rubric based on accurate data collection and presentation of conclusions. **Differentiation**: Students will be able to choose from a variety of different methods to solve the problems.

	Evaluative criteria consists of:	OTHER EVIDENCE:
T, M, A	● Is all given information correctly labeled in the diagram?	● Alternative assessment projects such as real world applications involving the properties of circles
M, A	● Is the correct vocabulary term and corresponding formula identified in solving the problem?	● Review of standardized test questions to prep students for the challenge of the SAT and ACT exams
T, M, A	● Are the properties of the segments identified and used to determine the existence of right triangles within the diagram?	● Participation in class discussion, group work, and responses. ● Quizzes
M, A	● Are calculations and solutions completed accurately?	● Unit Test - to include a variety of DOK level of problems and may include SAT style problems.

stage 3

Code	***Pre-Assessment***	
M	● Teacher checks for prerequisite and prior knowledge via warm-up and questioning activities, such as basic problems on substitution, solving equations, order of operations and identification of basic parts of a circle ● Prerequisite knowledge is reinforced through algebra review assignments ● Teacher will provide review and assessment on prerequisite geometric vocabulary knowledge to ensure all students are capable of communicating effectively	
	Summary of Key Learning Events and Instruction	Progress Monitoring
M	● Teacher will guide students in the definition of key terms.	● Monitoring class work through board work, group work, questioning, and walk-arounds
M, A	● Teacher will confirm with students the measure of angles using a protractor.	● Check for understanding via going over homework and mediums such as reflections and exit tickets
T, M, A	● Students will explore the measure of arc and angles using an activity to measure angles.	● Class worksheets with direct teacher observation or self assessment
M, A	● Teacher will describe how tangents, secants and line segments are related to circles	● Practice on whiteboard/chalkboard with direct teacher observation
T, M, A	● Students will demonstrate their understanding of tangents, secants, angles and arcs through class practice on whiteboards and worksheets	● Kahoot quiz or pear deck slideshow with review questions and direct teacher observation
M	● Teacher will describe the various situations where segments are divided on tangents and secants and the corresponding formulas used to determine their lengths	● Reflective journals or exit tickets at the end of the lesson
T, M, A	● Students will complete a variety of real world problems involving circles and right triangles.	● Google form/google slide show review assignments
T, M, A	● Students will complete a hands-on activity to measure the lines, sectors and angles involved in Track & Field.	● Homework assignments with direct teacher observation or self assessment

T, M, A	• Students will identify the relationship between central, inscribed interior and exterior angles and apply them to real applications **Suggested Resources and supplies** All Resources and materials must adhere to all New Milford Board of Education policies and regulations and are subject to New Milford Board of Education approval. Resources and materials must be researched and vetted by the writers and department heads prior to submission for approval. • Textbook: Bass, Laurie, et.al. . *Geometry Common Core.* 1st ed. Upper Saddle River, NJ: Pearson, Prentice Hall, 2012. Print. • Resource materials provided by Pearson such as implementing the common core, differentiation and standardized test practice • Resource from the Bureau of Education and Research: *Strengthening your geometry program: Ideas, strategies and hands-on activities* • Geogebra; interactive application: Hohenwarter, Markus • Kahoot; interactive game: Wiggins and Murphy • Geometer's Sketchpad; interactive application: KCP Technologies • Desmos; advanced graphing calculator • Google forms and Google slides with pear deck extension • Supplies: white boards, graph paper, colored pencils, 2-d and 3-d shapes, compass, ruler	• Projects/performance tasks modeling real world problems involving all aspects of proofs and constructions • Summative assessments Quizzes Unit test
