

Glen Ridge Public Schools –Mathematics Curriculum



Course Title: Applied Geometry

Subject: Mathematics

Grade Level:10/11

Duration:1 year

Prerequisite: Algebra I

Elective or Required: Elective

Mathematics Mission Statement

Mathematics is an integral part of our lives. Students must be actively involved in their mathematics education through the use of modeling and demonstrating the ability to persevere through problem solving. The mathematics curricula will emphasize critical thinking skills through a balance of logic and reasoning, attention to precision by utilizing patterns and structure, and bridging these ideas to cross-curricular learning. Students will be engaged and challenged in a student-centered learning environment that is developmentally appropriate and will communicate mathematical ideas, both in a verbal and written form. Through effectively applying hands-on manipulatives, basic computation skills and the use of technical writing to justify their processes, students will critique the work of themselves and others.

Course Description:

The purpose of this full-year, college preparatory credited class is to provide an overview of the concepts and skills in the Geometry Common Core State standards. Tools of geometry are studied, including points, lines, planes, distance and midpoint, and angles and angle relationships. In addition, several geometric constructions are explored. Basic segment, angle and triangle proofs are introduced. Parallel and perpendicular lines are studied, including congruent triangles, isosceles and equilateral triangles, congruence transformations of triangles, right triangles and an introduction to trigonometry, and similar triangles and similarity transformations. Parallelogram properties, including those of rectangles, rhombuses and squares, and also trapezoids are used to solve

problems. Circles, areas of plane figures and volumes of 3D figures are also emphasized. Students will be expected to develop an understanding of these concepts through explorations, investigations, cooperative learning, technology and problem-solving.

Author: Kimberly Burk

Date Submitted: Summer 2017

Applied Geometry

Topic/Unit: Lines and Angles

Approximate # Of Weeks: 4

Essential Questions:

- 1. What tools and methods can you use to copy a segment and bisect a segment?**
- 2. How do you use the distance formula to find distances and lengths in the coordinate plane?**
- 3. How do you use the midpoint formula to find the midpoint of a line segment in a coordinate plane?**
- 4. What tools and methods can you use to copy an angle and bisect an angle?**
- 5. What tools and methods can you use to construct parallel lines and perpendicular lines?**
- 6. How do you prove basic theorems about line segments and angles?**

Upon completion of this unit students will be able to:

- Name geometric figures (points, lines, planes, rays, segments, angles, parallel and perpendicular lines, skew lines,
- Copy and bisect a segment
- Find distance in the coordinate plane
- Use the distance formula
- Find midpoints of line segments in the coordinate plane
- Use the midpoint formula
- Copy an angle
- Construct the bisector of an angle
- Construct parallel lines
- Construct a perpendicular bisector
- Construct a perpendicular to a line (through a point not on the line)

- Use basic theorems about line segments and angles (properties of equality, segment addition, angle addition, linear pair, complementary, supplementary and vertical angles) to solve problems and prove statements.
- Use basic theorems about parallel and perpendicular lines (corresponding angles, same-side interior angles, alternate interior angles, alternate exterior angles, converse of the same-side interior angles, converse of alternate interior angles, converse of corresponding angles, equal-pair linear pair) to solve problems and prove statements.
- To find the slope of a line
- To use slope to identify parallel and perpendicular lines
- To write the equations of lines in the coordinate plane, graph them and classify as parallel, perpendicular, intersecting or coinciding

NJCCS: G.CO #1, 9, 12; G.GPE #4,5

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 8.1 -- Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills
- Standard 9.3 – Career Awareness, Exploration, and Preparation

Activities – include 21st Century Technologies:

- SmartBoard lessons
- Lecture and class discussion
- Guided notes
- Geogebra online graphing exploration
 - Technology Lab 1.2 Explore Properties Associated with Points
 - Technology Lab 3-6 Explore Parallel and Perpendicular Lines
- Connecting Geometry to Algebra--Systems of Equations
- Khan Academy
- Youtube videos

Enrichment Activities:

- 2-3 Geometry Lab--Solve Logic Puzzles
- Practice A and B worksheets
- Kuta worksheet
- TeachersPayTeachers various activities
- College Entrance Exam Practice

Methods of Assessments/Evaluation:

- Verbal Assessment
- Open Ended Questions
- Online Quizzes

- Homework
- Quizzes
- Check it Out Problems (questions during lecture)
- Thumbs up/down
- Think-pair-share
- Dry erase/blackboard response
- Kahoot
- Graded classwork
- Partner activities
- Google Classroom exit ticket/question
- Chapter Test
- Individual problem assessment during lesson
- Graphing calculator/Geogebra check
- Self-Assessment (4-3-2-1)

Resources/Including Online Resources

- Online Textbook Information: my.hrw.com, connected.mcgraw-hill.com
- Google Classroom
- Geogebra
- TI-84 Graphing calculator
- youtube channel: YayMath and others
- Khan Academy
- Hand-held Manipulatives

Topic/Unit: Triangles, Congruence, and Congruence Transformations

Approximate # Of Weeks: 8 weeks

Essential Questions:

1. What does it mean for two figures to be congruent?
2. What can you conclude about two triangles that are congruent?
3. How do you use congruence criteria SSS, SAS, ASA, and AAS to prove triangles congruent?
4. What can you say about the sum of the angle measures in a triangle?
5. What can you say about the base angles of an isosceles triangle?
6. How do you write a coordinate proof?
7. What transformation preserve the congruence of a figure?
8. How do you draw the image of a figure under a reflection, translation and rotation?

Upon completion of this unit students will be able to:

- Classify triangles by angle measures and side lengths
- Determine if figures are congruent
- Use the SSS postulate to test for triangle congruence

- Use the SAS postulate to test for triangle congruence
- Use the ASA postulate to test for triangle congruence
- Use the AAS postulate to test for triangle congruence
- Use the HL postulate to test for triangle congruence
- Find unknown dimensions in congruent triangles (using CPCTC)
- Apply the triangle-sum theorem
- Apply the exterior angle theorem
- Apply the Third Angles Theorem
- Use properties of isosceles triangles
- Use properties of equilateral triangles
- Use coordinates to prove simple geometric theorems
- Classify the congruence transformations: Translations Reflections and Rotations
- Draw a reflection image in the coordinate plane
- Draw a translation image using a vector in the coordinate plane
- Draw a rotation image in the coordinate plane
- Specify a sequence of transformations that will carry a given figure onto another or itself (symmetry)

NJCCS

- G.CO #1, 5-10, 12; G.GPE.4, G.SRT #5

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 8.1 -- Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills
- Standard 9.3 – Career Awareness, Exploration, and Preparation

Activities – include 21st Century Technologies:

- SmartBoard lessons
- Lecture and class discussion
- Guided notes
- Construction: Congruent Triangles using SAS and ASA
- Geogebra online graphing exploration
 - Technology Lab 1.7 Explore Transformations
 - Technology Lab 4-4 Explore SSS and SAS Triangle Congruence'
 - Technology Lab 4-6 Predict Other Triangle Congruence Relationships
 - Explore the congruence transformations
- Khan Academy
- Youtube videos

Enrichment Activities:

- Math and Art: M.C. Escher,
- Math and Art: Tessellations
- Extension: Solids of Rotation
- Multi-Step Test Prep--Triangles and Congruence Origami
- Practice A and B worksheets
- Kuta worksheet
- TeachersPayTeachers various activities
- College Entrance Exam Practice

Methods of Assessments/Evaluation:

- Verbal Assessment
- Open Ended Questions
- Online Quizzes
- Homework
- Quizzes
- Check it Out Problems (questions during lecture)
- Thumbs up/down
- Think-pair-share
- Dry erase/blackboard response
- Kahoot
- Graded classwork
- Partner activities
- Google Classroom exit ticket/question
- Chapter Test
- Individual problem assessment during lesson
- Graphing calculator/Geogebra check
- Self-Assessment (4-3-2-1)

Resources/Including Online Resources

- Online Textbook Information: my.hrw.com, connected.mcgraw-hill.com
- Google Classroom
- Geogebra
- TI-84 Graphing calculator
- youtube channel: YayMath and others
- Khan Academy

Topic/Unit: Special Properties of Triangles

Approximate # Of Weeks: 3

Essential Questions:

1. What properties can be applied to perpendicular bisectors?

2. What properties can be applied to angle bisectors?
3. Why is the centroid a special point in a triangle?
4. What properties are there of the midsegment of a triangle?
5. What inequality relationships can be found in 1 and 2 triangles?

Upon completion of this unit students will be able to:

- To apply the Perpendicular Bisector Theorem and its converse to solve problems
- To apply the Angle Bisector Theorem and its converse to solve problems
- To apply the Centroid theorem to solve problems
- To apply the Triangle Midsegment Theorem to solve problems
- To use the Angle-Side relationships in triangles to order the sides and angles in 1 triangle
- To use the Triangle Inequality Theorem to determine the validity of a triangle
- To use the Hinge Theorem and its converse to compare angles and sides in 2 triangles

NJCCS
G.CO.9,10
G.C.3
G.MG.2

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 8.1 -- Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills
- Standard 9.3 – Career Awareness, Exploration, and Preparation

Activities – include 21st Century Technologies:

- SmartBoard lessons
- Lecture and class discussion
- Guided notes
- Construction: Centroid of a Triangle
- Construction: Midsegment of a Triangle
- Geogebra online graphing exploration--
 - o Perpendicular and Angle Bisectors
 - o Geometry lab 5-5 Explore Triangle Inequalities
- Khan Academy
- Youtube videos

Enrichment Activities:

- Practice A and B worksheets
- Kuta worksheet
- TeachersPayTeachers various activities
- College Entrance Exam Practice

Methods of Assessments/Evaluation:

- Verbal Assessment
- Open Ended Questions
- Online Quizzes
- Homework
- Quizzes
- Check it Out Problems (questions during lecture)
- Thumbs up/down
- Think-pair-share
- Dry erase/blackboard response
- Kahoot
- Graded classwork
- Partner activities
- Google Classroom exit ticket/question
- Chapter Test
- Individual problem assessment during lesson
- Graphing calculator/Geogebra check
- Self-Assessment (4-3-2-1)

Resources/Including Online Resources

- Online Textbook Information: my.hrw.com, connected.mcgraw-hill.com
- Google Classroom
- Geogebra
- TI-84 Graphing calculator
- youtube channel: YayMath and others
- Khan Academy

Topic/Unit: Similarity and Similarity Transformations

Approximate # Of Weeks: 4

Essential Questions:

1. What does it mean for two figures to be similar?
2. What can you conclude about similar triangles and how can you prove triangles are similar?

3. How can you use similar triangles and similar rectangles to solve problems?
4. How does a line that is parallel to one side of a triangle divide the two sides that it intersects?
5. What are the key properties of dilations?
6. How do you draw the image of a figure under a dilation?

Upon completion of this unit students will be able to:

- Solve problems using the properties of similar polygons
- Use proportions to identify similar polygons
- Use similar triangles to solve problems
- Identify similar triangles and use triangle similarity theorems: AA, SSS and SAS
- Use proportional parts within triangles
- Apply the Triangle Proportionality Theorem and Corollaries to solve problems
- Apply the Triangle Angle Bisector Theorem to solve problems
- Use scale drawings to solve problems
- To use scale factor to id and draw dilations
- Verify similarity after a similarity transformation

NJCCCS

G.C #1; G.CO #2, 8; G.MG #3; G.SRT #1- 5

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 8.1 -- Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills
- Standard 9.3 – Career Awareness, Exploration, and Preparation

Activities – include 21st Century Technologies:

- SmartBoard lessons
- Lecture and class discussion
- Guided notes
- Geogebra online graphing exploration
 - o 7-3 Technology Lab--Predict Triangle Similarity Relationships
 - o Construction of the Triangle Proportionality Theorem
 - o Construction of the Angle Bisector Theorem
- Similar Triangle Sort
- Khan Academy
- Youtube videos

Enrichment Activities:

- Segment Partition Extension
- Practice A and B worksheets
- Kuta worksheet
- TeachersPayTeachers various activities
- College Entrance Exam Practice

Methods of Assessments/Evaluation:

- Verbal Assessment
- Open Ended Questions
- Online Quizzes
- Homework
- Quizzes
- Check it Out Problems (questions during lecture)
- Thumbs up/down
- Think-pair-share
- Dry erase/blackboard response
- Kahoot
- Graded classwork
- Partner activities
- Google Classroom exit ticket/question
- Chapter Test
- Individual problem assessment during lesson
- Graphing calculator/Geogebra check
- Self-Assessment (4-3-2-1)

Resources/Including Online Resources

- Online Textbook Information: my.hrw.com, connected.mcgraw-hill.com
- Google Classroom
- Geogebra
- TI-84 Graphing calculator
- youtube channel: YayMath and others
- Khan Academy

Topic/Unit: Right Triangles and Trigonometry**Approximate # Of Weeks: 4****Essential Questions:**

1. How do you find the sine, cosine, and tangent ratios for an acute angle or a right triangle?

2. What can you say about the side lengths and the trigonometric ratios associated with special right triangles?
3. How do you find an unknown angle measure in a right triangle?

Upon completion of this unit students will be able to:

- To use the Pythagorean Theorem to find missing sides of a right triangle
- To use the converse of the Pythagorean Theorem and Pythagorean inequalities to classify triangles
- To use similarity relationships in right triangles to find missing sides
- Use trigonometric ratios to find side lengths in right triangles
- Use inverse trigonometric ratios to find angle measure in right triangles
- Use the properties of 45-45-90 triangles to find side lengths
- Use the properties of 30-60-90 triangles to find side lengths
- Use trigonometry to solve angles of depression and elevation applied problems

NJCCS: G.SRT #6-8

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 8.1 -- Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills
- Standard 9.3 – Career Awareness, Exploration, and Preparation

Activities – include 21st Century Technologies:

- SmartBoard lessons
- Lecture and class discussion
- Guided notes
- Geogebra online graphing exploration
- Khan Academy
- Youtube videos
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Enrichment Activities:

- Extension: Trigonometric Ratios and Complementary Angles
- Practice A and B worksheets
- Kuta worksheet
- TeachersPayTeachers various activities
- College Entrance Exam Practice

Methods of Assessments/Evaluation:

- Verbal Assessment

- Open Ended Questions
- Online Quizzes
- Homework
- Quizzes
- Check it Out Problems (questions during lecture)
- Thumbs up/down
- Think-pair-share
- Dry erase/blackboard response
- Kahoot
- Graded classwork
- Partner activities
- Google Classroom exit ticket/question
- Chapter Test
- Individual problem assessment during lesson
- Graphing calculator/Geogebra check
- Self-Assessment (4-3-2-1)

Resources/Including Online Resources

- Online Textbook Information: my.hrw.com, connected.mcgraw-hill.com
- Google Classroom
- Geogebra
- TI-84 Graphing calculator
- youtube channel: YayMath and others
- Khan Academy

Topic/Unit: Quadrilaterals and Polygons

Approximate # Of Weeks: 4

Essential Questions:

1. **What can you conclude about the sides and angles of parallelograms?**
2. **What can you conclude about the diagonals of a parallelogram?**
3. **What criteria can you use to prove that a quadrilateral is a parallelogram?**
4. **What are the side, angle and diagonal properties of rectangles, rhombuses and squares?**
5. **How does a trapezoid differ from a parallelogram?**

Upon completion of this unit students will be able to:

- Classify polygons based on sides and angles

- Use the Polygon Interior and Exterior Angle-Sum Theorem to find interior and exterior angles of polygons
- Recognize and apply properties of the sides, angles, and diagonals of parallelograms
- Recognize the conditions that ensure a quadrilateral is a parallelogram
- Recognize and apply properties of the sides, angles, and diagonals of rectangles, rhombi and squares
- Determine whether parallelograms are rectangles, rhombi or squares
- Apply the properties of trapezoids and isosceles trapezoids and use to solve problems

NJCCS:

G.CO #3, 11; G.SRT #5

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 8.1 -- Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills
- Standard 9.3 – Career Awareness, Exploration, and Preparation

Activities – include 21st Century Technologies:

- SmartBoard lessons
- Lecture and class discussion
- Guided notes
- Geogebra online graphing exploration
 - 6-5 Technology Lab--Predict Conditions for Special Parallelograms
 - 6-6 Technology Lab--Explore Isosceles Trapezoids
- Khan Academy
- Youtube videos

Enrichment Activities:

- Practice A and B worksheets
- Kuta worksheet
- TeachersPayTeachers various activities
- College Entrance Exam Practice

Methods of Assessments/Evaluation:

- Verbal Assessment
- Open Ended Questions
- Online Quizzes
- Homework
- Quizzes

- Check it Out Problems (questions during lecture)
- Thumbs up/down
- Think-pair-share
- Dry erase/blackboard response
- Kahoot
- Graded classwork
- Partner activities
- Google Classroom exit ticket/question
- Chapter Test
- Individual problem assessment during lesson
- Graphing calculator/Geogebra check
- Self-Assessment (4-3-2-1)

Resources/Including Online Resources

- Online Textbook Information: my.hrw.com, connected.mcgraw-hill.com
- Google Classroom
- Geogebra
- TI-84 Graphing calculator
- youtube channel: YayMath and others
- Khan Academy

Topic/Unit: Circles

Approximate # Of Weeks: 4 weeks

Essential Questions:

1. What is the relationship between central angles and inscribed angles in a circle?
2. What can you conclude about the angles of a quadrilateral inscribed in a circle?
3. What are the key theorems about tangent lines, secants and chords to a circle and the angles and segments they form?
4. How do you write the equation of a circle in the coordinate plane if you know its center and radius?

Upon completion of this unit students will be able to:

- Identify tangents, secants and chords
- Use theorems about tangents to solve problems
- Identify central angles, major arcs, minor arcs, and semicircles, and find their measure
- Use the Arc Addition Postulate to solve problems
- Use the theorems about congruent arcs and chords to solve problems

- To find sector area and arc length
- Find measures of inscribed angles and use to solve problems
- Find measures of angles in inscribed polygons
- Find the measures of angles formed by lines intersecting in, on and outside of a circle
- Use the Chord-Chord, Secant-Secant, and Secant-Tangent Product Theorems to find the lengths of segments
- To graph and find the equation of a circle in the coordinate plane.

NJCCS:

G.C# 2-5; G.CO #12,13; G.GPE.1

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 8.1 -- Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills
- Standard 9.3 – Career Awareness, Exploration, and Preparation

Activities – include 21st Century Technologies:

- SmartBoard lessons
- Lecture and class discussion
- Guided notes
- Geogebra online graphing exploration
 - Construction: Tangent line to a circle
 - Construction: Inscribed quadrilateral
 - 12-5 Technology Lab--Explore Angle Relationships in Circles
 - 12-6 Technology Lab--Explore Segment Relationships in Circles
- Khan Academy
- Youtube videos

Enrichment Activities:

- Construct the center of a circle
- Practice A and B worksheets
- Kuta worksheet
- TeachersPayTeachers various activities
- College Entrance Exam Practice

Methods of Assessments/Evaluation:

- Verbal Assessment
- Open Ended Questions
- Online Quizzes

- Homework
- Quizzes
- Check it Out Problems (questions during lecture)
- Thumbs up/down
- Think-pair-share
- Dry erase/blackboard response
- Kahoot
- Graded classwork
- Partner activities
- Google Classroom exit ticket/question
- Chapter Test
- Individual problem assessment during lesson
- Graphing calculator/Geogebra check
- Self-Assessment (4-3-2-1)

Resources/Including Online Resources

- Online Textbook Information: my.hrw.com, connected.mcgraw-hill.com
- Google Classroom
- Geogebra
- TI-84 Graphing calculator
- youtube channel: YayMath and others
- Khan Academy

Topic/Unit: Linear and Area Measurement

Approximate # Of Weeks: 2

Essential Questions:

- 1. How do you find the perimeter and area of polygons on the coordinate plane?**
- 2. How do you justify and use the formula for the circumference?**
- 3. How do you utilize the formulas for area to find areas of composite figures?**

Upon completion of this unit students will be able to:

- Find the perimeter of polygons
- Find the area of polygons using the coordinate plane
- Find the area of parallelograms, triangles, trapezoids and rhombi
- Find the circumference of a circle
- Find areas of circles

- Find the area of regular polygons
- Find the area of composite figures using the Area Addition Postulate

NJCCCS:

G.C #5;

G.CO #1;

G.GMD #1;

G.MG #3;

G.GPE #7;

N.Q #3 ;

A.SSE.1,

A.CED.4;

G.SRT.9

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 8.1 -- Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills
- Standard 9.3 – Career Awareness, Exploration, and Preparation

Activities – include 21st Century Technologies:

- SmartBoard lessons
- Lecture and class discussion
- Guided notes
- Geogebra online graphing exploration
- Khan Academy
- Youtube videos

Enrichment Activities:

- Connecting Geometry to Algebra: Literal Equations
- Geometry Lab 10-2: Develop π
- Practice A and B worksheets
- Kuta worksheet
- TeachersPayTeachers various activities
- College Entrance Exam Practice

Methods of Assessments/Evaluation:

- Verbal Assessment
- Open Ended Questions
- Online Quizzes
- Homework
- Quizzes

- Check it Out Problems (questions during lecture)
- Thumbs up/down
- Think-pair-share
- Dry erase/blackboard response
- Kahoot
- Graded classwork
- Partner activities
- Google Classroom exit ticket/question
- Chapter Test
- Individual problem assessment during lesson
- Graphing calculator/Geogebra check
- Self-Assessment (4-3-2-1)

Resources/Including Online Resources

- Online Textbook Information: my.hrw.com, connected.mcgraw-hill.com
- Google Classroom
- Geogebra
- TI-84 Graphing calculator
- youtube channel: YayMath and others
- Khan Academy

Topic/Unit: Volume

Approximate # Of Weeks: 4

Essential Questions:

- How do you identify cross sections of three-dimensional figures?
- How do you calculate the volume of a prism or cylinder?
- How do you calculate the volume of a pyramid?
- How do you calculate the volume of a cone?
- How do you calculate the volume of a sphere?
- How do you use geometry to solve design problems?

Upon completion of this unit students will be able to:

- Investigate cross-sections of three-dimensional figures
- Find volume of prisms
- Find volume of cylinders
- Find volume of pyramids
- Find volume of cones
- Find volume of spheres
- Find surface area of prisms, cylinders, pyramids, cones and spheres (time permitting)

NJCCS

G.GMD #1, 3, 4; G.MG #1-3

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 8.1 -- Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills
- Standard 9.3 – Career Awareness, Exploration, and Preparation

Activities – include 21st Century Technologies:

- SmartBoard lessons
- Lecture and class discussion
- Guided notes
- Geogebra online graphing exploration
- Khan Academy
- Youtube videos
- Reading and Writing Math: Draw Three-Dimensional Figures

Enrichment Activities:

- College Entrance Exam Practice
- Practice A and B worksheets
- Kuta worksheet
- TeachersPayTeachers various activities

Methods of Assessments/Evaluation:

- Verbal Assessment
- Open Ended Questions
- Online Quizzes
- Homework
- Quizzes
- Check it Out Problems (questions during lecture)
- Thumbs up/down
- Think-pair-share
- Dry erase/blackboard response
- Kahoot
- Graded classwork
- Partner activities
- Google Classroom exit ticket/question
- Chapter Test
- Individual problem assessment during lesson

- Graphing calculator/Geogebra check
- Self-Assessment (4-3-2-1)

Resources/Including Online Resources

- Online Textbook Information: my.hrw.com, connected.mcgraw-hill.com
- Google Classroom
- Geogebra
- TI-84 Graphing calculator
- youtube channel: YayMath and others
- Khan Academy

Attachment: Unit Scales for Student Self-Assessment

Topic/Unit: Lines and Angles

Essential Questions:

1. What tools and methods can you use to copy a segment and bisect a segment?
2. How do you use the distance formula to find distances and lengths in the coordinate plane?
3. How do you use the midpoint formula to find the midpoint of a line segment in a coordinate plane?
4. What tools and methods can you use to copy an angle and bisect an angle?
5. What tools and methods can you use to construct parallel lines and perpendicular lines?
6. How do you prove basic theorems about line segments and angles?

<u>Level of Learning</u>	<u>Objectives</u>	<u>Student Assessment</u> 4: I can teach others 3: I can pass an assessment on this topic 2: I'm getting there but need more practice 1: I still don't understand
1	<ul style="list-style-type: none"> ● Name geometric figures (points, lines, planes, rays, segments, angles, parallel and perpendicular lines, skew lines, ● Copy and bisect a segment ● Copy an angle ● Construct the bisector of an angle ● Construct parallel lines ● Construct a perpendicular bisector ● Construct a perpendicular to a line (through a point not on the line) 	
2	<ul style="list-style-type: none"> ● Find distance in the coordinate plane ● Use the distance formula ● Find midpoints of line segments in the coordinate plane 	

	<ul style="list-style-type: none"> ● Use the midpoint formula ● To find the slope of a line 	
3	<ul style="list-style-type: none"> ● To use slope to identify parallel and perpendicular lines ● To write the equations of lines in the coordinate plane, graph them and classify as parallel, perpendicular, intersecting or coinciding 	
4	<ul style="list-style-type: none"> ● Use basic theorems about line segments and angles (properties of equality, segment addition, angle addition, linear pair, complementary, supplementary and vertical angles) to solve problems and prove statements. ● Use basic theorems about parallel and perpendicular lines (corresponding angles, same-side interior angles, alternate interior angles, alternate exterior angles, converse of the same-side interior angles, converse of alternate interior angles, converse of corresponding angles, equal-pair linear pair) to solve problems and prove statements. 	

Topic/Unit: Triangles, Congruence, and Congruence Transformations

Essential Questions:

1. What does it mean for two figures to be congruent?
2. What can you conclude about two triangles that are congruent?
3. How do you use congruence criteria SSS, SAS, ASA, and AAS to prove triangles congruent?
4. What can you say about the sum of the angle measures in a triangle?
5. What can you say about the base angles of an isosceles triangle?
6. How do you write a coordinate proof?
7. What transformation preserve the congruence of a figure?
8. How do you draw the image of a figure under a reflection, translation and rotation?

<u>Level of Learning</u>	<u>Objectives</u>	<u>Student Assessment</u> 4: I can teach others 3: I can pass an assessment on this topic
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		2: I'm getting there but need more practice 1: I still don't understand
1	<ul style="list-style-type: none"> • Classify triangles by angle measures and side lengths • Determine if figures are congruent • Classify the congruence transformations: Translations Reflections and Rotations 	
2	<ul style="list-style-type: none"> • Use properties of isosceles triangles • Use properties of equilateral triangles • Draw a reflection image in the coordinate plane • Draw a translation image using a vector in the coordinate plane • Draw a rotation image in the coordinate plane 	
3	<ul style="list-style-type: none"> • Find unknown dimensions in congruent triangles (using CPCTC) • Apply the triangle-sum theorem • Apply the exterior angle theorem • Apply the Third Angles Theorem • Specify a sequence of transformations that will carry a given figure onto another or itself (symmetry) 	
4	<ul style="list-style-type: none"> • Use the SSS postulate to test for triangle congruence • Use the SAS postulate to test for triangle congruence • Use the ASA postulate to test for triangle congruence • Use the AAS postulate to test for triangle congruence • Use the HL postulate to test for triangle congruence • Use coordinates to prove simple geometric theorems 	

Topic/Unit: Special Properties of Triangles

Essential Questions:

1. What properties can be applied to perpendicular bisectors?
2. What properties can be applied to angle bisectors?
3. Why is the centroid a special point in a triangle?
4. What properties are there of the midsegment of a triangle?
5. What inequality relationships can be found in 1 and 2 triangles?

<u>Level of Learning</u>	<u>Objectives</u>	<u>Student Assessment</u> 4: I can teach others 3: I can pass an assessment on this topic 2: I'm getting there but need more practice 1: I still don't understand
1	None	
2	<ul style="list-style-type: none"> ● To use the Angle-Side relationships in triangles to order the sides and angles in 1 triangle ● To use the Triangle Inequality Theorem to determine the validity of a triangle 	
3	<ul style="list-style-type: none"> ● To apply the Perpendicular Bisector Theorem and its converse to solve problems ● To apply the Angle Bisector Theorem and its converse to solve problems ● To apply the Centroid theorem to solve problems ● To apply the Triangle Midsegment Theorem to solve problems 	
4	<ul style="list-style-type: none"> ● To use the Hinge Theorem and its converse to compare angles and sides in 2 triangles 	

Topic/Unit: Topic/Unit: Similarity and Similarity Transformations

Essential Questions:

1. What does it mean for two figures to be similar?
2. What can you conclude about similar triangles and how can you prove triangles are similar?
3. How can you use similar triangles and similar rectangles to solve problems?
4. How does a line that is parallel to one side of a triangle divide the two sides that it intersects?
5. What are the key properties of dilations?
6. How do you draw the image of a figure under a dilation?

<u>Level of Learning</u>	<u>Objectives</u>	<u>Student Assessment</u> 4: I can teach others 3: I can pass an assessment on this topic 2: I'm getting there but need more practice 1: I still don't understand
1	<ul style="list-style-type: none"> ● Identify similar triangles and use triangle similarity theorems: AA, SSS and SAS 	
2	<ul style="list-style-type: none"> ● Use proportions to identify similar polygons ● Use proportional parts within triangles ● To use scale factor to id and draw dilations 	
3	<ul style="list-style-type: none"> ● Use scale drawings to solve problems ● Verify similarity after a similarity transformation 	
4	<ul style="list-style-type: none"> ● Use similar triangles to solve problems ● Apply the Triangle Proportionality Theorem and Corollaries to solve problems ● Apply the Triangle Angle Bisector Theorem to solve problems ● Solve problems using the properties of similar polygons 	

Topic/Unit: Right Triangles and Trigonometry

Essential Questions:

1. How do you find the sine, cosine, and tangent ratios for an acute angle or a right triangle?
2. What can you say about the side lengths and the trigonometric ratios associated with special right triangles?
3. How do you find an unknown angle measure in a right triangle?

<u>Level of Learning</u>	<u>Objectives</u>	<u>Student Assessment</u> 4: I can teach others 3: I can pass an assessment on this topic 2: I'm getting there but need more practice 1: I still don't understand
1	<ul style="list-style-type: none"> • none 	
2	<ul style="list-style-type: none"> • Use the properties of 45-45-90 triangles to find side lengths • Use the properties of 30-60-90 triangles to find side lengths • To use the Pythagorean Theorem to find missing sides of a right triangle 	
3	<ul style="list-style-type: none"> • To use the converse of the Pythagorean Theorem and Pythagorean inequalities to classify triangles • Use trigonometric ratios to find side lengths in right triangles • Use inverse trigonometric ratios to find angle measure in right triangles 	
4	<ul style="list-style-type: none"> • Use trigonometry to solve angles of depression and elevation applied problems 	

Topic/Unit: Quadrilaterals and Polygons

Essential Questions:

1. What can you conclude about the sides and angles of parallelograms?
2. What can you conclude about the diagonals of a parallelogram?
3. What criteria can you use to prove that a quadrilateral is a parallelogram?
4. What are the side, angle and diagonal properties of rectangles, rhombuses and squares?
5. How does a trapezoid differ from a parallelogram?

<u>Level of Learning</u>	<u>Objectives</u>	<u>Student Assessment</u> 4: I can teach others 3: I can pass an assessment on this topic 2: I'm getting there but need more practice 1: I still don't understand
1	<ul style="list-style-type: none"> ● Classify polygons based on sides and angles 	
2	<ul style="list-style-type: none"> ● Use the Polygon Interior and Exterior Angle-Sum Theorem to find interior and exterior angles of polygons ● Recognize the conditions that ensure a quadrilateral is a parallelogram 	
3	<ul style="list-style-type: none"> ● Recognize and apply properties of the sides, angles, and diagonals of parallelograms ● Determine whether parallelograms are rectangles, rhombi or squares ● Apply the properties of trapezoids and isosceles trapezoids and use to solve problems 	
4	<ul style="list-style-type: none"> ● None 	

Topic/Unit: Circles

Essential Questions:

1. What is the relationship between central angles and inscribed angles in a circle?
2. What can you conclude about the angles of a quadrilateral inscribed in a circle?
3. What are the key theorems about tangent lines, secants and chords to a circle and the angles and segments they form?
4. How do you write the equation of a circle in the coordinate plane if you know its center and radius?

<u>Level of Learning</u>	<u>Objectives</u>	<u>Student Assessment</u> 4: I can teach others 3: I can pass an assessment on this topic 2: I'm getting there but need more practice 1: I still don't understand
1	<ul style="list-style-type: none"> ● Identify tangents, secants and chords ● Identify central angles, major arcs, minor arcs, and semicircles 	
2	<ul style="list-style-type: none"> ● Find the measure of central angles, major arcs, minor arcs, and semicircles ● Find the measure of inscribed angles and use to solve problems ● Find measures of angles in inscribed polygons ● To find sector area and arc length 	
3	<ul style="list-style-type: none"> ● Use the Arc Addition Postulate to solve problems ● Use the theorems about congruent arcs and chords to solve problems ● Find the measures of angles formed by lines intersecting in, on and outside of a circle ● Use the Chord-Chord, Secant-Secant, and Secant-Tangent Product Theorems to find the lengths of segments 	

4	<ul style="list-style-type: none"> ● Use theorems about tangents to solve problems ● To graph and find the equation of a circle in the coordinate plane. 	
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Topic/Unit: Linear and Area Measurement

Essential Questions:

1. How do you find the perimeter and area of polygons on the coordinate plane?
2. How do you justify and use the formula for the circumference?
3. How do you utilize the formulas for area to find areas of composite figures?

<u>Level of Learning</u>	<u>Objectives</u>	<u>Student Assessment</u>
1	<ul style="list-style-type: none"> ● None 	4: I can teach others 3: I can pass an assessment on this topic 2: I'm getting there but need more practice 1: I still don't understand
2	<ul style="list-style-type: none"> ● Find the perimeter of polygons ● Find the area of polygons using the coordinate plane ● Find the area of parallelograms, triangles, trapezoids and rhombi ● Find the circumference of a circle ● Find areas of circles ● Find the area of regular polygons 	
3	<ul style="list-style-type: none"> ● Find the area of composite figures using the Area Addition Postulate 	
4	<ul style="list-style-type: none"> ● <u>None</u> 	

Topic/Unit: Volume

Essential Questions:

1. How do you identify cross sections of three-dimensional figures?
2. How do you calculate the volume of a prism or cylinder?
3. How do you calculate the volume of a pyramid?
4. How do you calculate the volume of a cone?
5. How do you calculate the volume of a sphere?
6. How do you use geometry to solve design problems?

<u>Level of Learning</u>	<u>Objectives</u>	<u>Student Assessment</u> 4: I can teach others 3: I can pass an assessment on this topic 2: I'm getting there but need more practice 1: I still don't understand
1	<ul style="list-style-type: none">• None	
2	<ul style="list-style-type: none">• Find volume of prisms• Find volume of cylinders• Find volume of pyramids• Find volume of cones• Find volume of spheres• Find surface area of prisms, cylinders, pyramids, cones and spheres (time permitting)	
3	<ul style="list-style-type: none">• Investigate cross-sections of three-dimensional figures	
4	<ul style="list-style-type: none">• None	