Course Title: Geometry		
School:THS	**Grade: 9 -10**	**Curriculum Pacing: 36 weeks**
Unit One: Constructions and Rigid Transformations	**Unit Two: Congruence**	**Unit Three: Similarity**
Unit Pacing: 6 weeks	**Unit Pacing: 6 weeks**	**Unit Pacing: 6 weeks**
Unit Overview: A focus of this unit is for students to explore properties of shapes in the plane without the aid of given measurements. Students create rigid motions using construction tools with no coordinate grid. This leads to more rigorous definitions of rotations, reflections, and translations. Constructions are used throughout several lessons to introduce students to reasoning about distances, generating conjectures, and attending to the level of precision required to define rigid motions later in the unit.To prepare students for future congruence proofs, students start to come up with a systematic, point-by-point sequence of transformations that will work to take any pair of congruent polygons onto one another. This point-by-point perspective also illustrates the transition from thinking about transformations as “moves” on the grid to thinking about transformations as functions that take points as inputs and produce points as outputs.	**Unit Overview**: In this unit, rigid transformations are used to justify the triangle congruence theorems of Euclidean geometry: Side-Side-Side Triangle Congruence, Side-Angle-Side Triangle Congruence, and Angle-Side-Angle Triangle Congruence. Students justify that for each set of criteria, a sequence of rigid motions exist that will take one triangle onto the other. Students learn to explain how two triangles with all three pairs of corresponding side lengths congruent can be taken onto one another using a more general sequence of rigid motions. Students will justify how they know that a given sequence of transformations will result in the vertices coinciding. Students also get the opportunity to immediately apply theorems they have proven to new contexts in which those theorems help them prove new results.	**Unit Overview**: This unit balances a focus on proof with a focus on using similar triangles to find unknown side lengths and angle measurements. Students use dilations and rigid transformations to justify triangles are similar. Students are then able to prove the Angle-Angle Triangle Similarity Theorem. Early in the unit, students prove theorems using rigid transformations and dilations. Later in the unit, students use similarity shortcuts, especially the Angle-Angle Triangle Similarity Theorem, to justify that triangles must be similar and to find unknown side lengths using the fact that side lengths in similar figures are in the same proportion. This unit previews many of the important concepts that students rely on to make sense of trigonometry in later units. The latter part of the unit focuses on similar right triangles. In addition, students are introduced to some of the applications of right triangles that they will explore in more depth in the trigonometry unit, such as finding the heights of objects through indirect measurement.
Compelling Questions 1. What are the basic parts of any construction or description in geometry?	**Compelling Questions** 1. What is the least amount of information needed in order to say two figures are congruent?	**Compelling Questions** 1. How are proportions used to verify similarity between objects?

2. How do geometric constructions help me understand properties of plane figures?	2.Why can you only prove congruence of two (non-right) triangles through SSS, SAS, ASA, and AAS?	2. How are dilations and rigid transformations used to prove similarity?
Priority Learning Targets 1.I can use precise mathematical language to describe a construction. 2. I can produce a sequence of transformations that will work to take any pair of congruent polygons onto one another. 3. I can create conjectures about angle relationships and prove them using what I know about rigid transformations. HSG-CO.A.1,2,3,4,5 HSG-CO.B.6 HSG-CO.C.9,10 HSG-CO.D.12,13 HSG-MG.A.1,3 HSN-Q.A.1,2,3	**Priority Learning Targets** 1. I can use rigid transformations to explain why figures are congruent. 2. I can prove theorems and critique proofs about quadrilaterals. 3. I can rewrite a conjecture so it is specific enough to prove. HSG-CO.A.1,3,5 HSG-CO.B.6,7,8 HSG-CO.C.9,10,11 HSG-MG.A.1,3 HSG-GMD.A.3 HSG-SRT.A.3 HSN-Q.A.1,2,3	**Priority Learning Targets** 1. I can explain what happens to lines and angles in a dilation. 2. I can explain the relationships between corresponding sides and angles in similar triangles. 3. I can interpret and solve problems involving similar right triangles. HSA-CED.A.4 HSG-C.A.1 HSG-CO.A.2 HSG-CO.C.10 HSG-MG.A.1,2,3 HSG-SRT.A.1,1.a,1.b,2,3 HSG-SRT.B.4,5 HSG-SRT.C.6,8 HSN-Q.A.1,3
Unit Four: Right Triangle Trigonometry	**Unit Five: Solid Geometry**	**Unit Six: Circles**
Unit Pacing: 6 weeks	**Unit Pacing: 6 weeks**	**Unit Pacing: 6 weeks**
Unit Overview: This unit examines some special cases of similar right triangles to solidify the idea that any right triangles with a single congruent acute angle are similar. From there students generate data for the side length ratios of many sets of right triangles. This data is organized which students apply to problems. Taking the time to both build and	**Unit Overview**: In this unit, students practice spatial visualization in three dimensions, study the effect of dilation on area and volume, derive volume formulas using dissection arguments and Cavalieri's Principle, and apply volume formulas to solve problems involving surface area to volume ratios, density, cube roots, and square roots. Students first practice	**Unit Overview**: Students begin by defining the terms chord, arc, and central angle, and they use their new vocabulary to write a proof about congruent chords in circles Students construct lines tangent to circles, then prove that a tangent line is perpendicular to the radius drawn to the point of tangency. They apply this result to an analysis of the

use the table helps students build a solid foundation before they learn the names of trigonometric ratios. Once students have practiced estimating both side lengths and angle measures using the table, they learn the names cosine, sine, and tangent. Students notice patterns between the columns for cosine and sine before they even learn the names cosine and sine. In a subsequent lesson they investigate that relationship, proving the two ratios are equal for complementary angles. Finding the measures of acute angles in a right triangle follows a similar arc.	spatial visualization by examining solids of rotation, envisioning these solids by rotating paper figures using a pencil as an axis of rotation. Then, students extend their study of scaling to solids. They work backwards from a scaled volume or surface area to find the scale factor involved, requiring the introduction of cube roots. In the final lessons, students apply what they know about volume to solve problems. They calculate densities, analyze surface area to volume ratios, and use graphs that represent equations involving square roots and cube roots to answer questions about situations.	relationship between central and circumscribed angles. Students construct lines tangent to circles, then prove that a tangent line is perpendicular to the radius drawn to the point of tangency. They apply this result to an analysis of the relationship between central and circumscribed angles. Next, students connect their findings about inscribed angles to cyclic quadrilaterals, or quadrilaterals which can be circumscribed by a circle. Next, students connect their findings about inscribed angles to cyclic quadrilaterals, or quadrilaterals which can be circumscribed by a circle.
Compelling Questions: 1. How does connecting similarity, proportional reasoning, and scale factors to right triangles help me understand Trigonometric ratios? 2. How do we use right triangle and Trigonometry to solve everyday problems?	**Compelling Questions** 1. How can we use concepts of dilations, cross sections, dissections to derive the formula for the volume of a pyramid or cone. 2. How will the graphs of square roots and cube roots help us analyze surface area to volume ratios?	**Compelling Questions** 1. How can we find the measure of a segment that is not a straight line? 2. What is pi (π)?
Priority Learning Targets 1. I can explain why knowing one acute angle in a right triangle determines the ratio of the side lengths. 2. I can use Sine, Cosine, and Tangent to calculate the lengths of sides and/or measures of angles.. 3. I can use trigonometric functions to find the height of an object HSG-MG.A.1,3	**Priority Learning Targets** 1. I can visualize and draw multiple cross sections of a three-dimensional figure. 2. I can explain how finding the volume of a prism relates to finding the volume of a cylinder. 3. I know that the density of an object is the ratio between its mass and its volume. HSA-CED.A.2	**Priority Learning Targets** 1. I can calculate the measure of a radius, diameter, and circumference. 2. I can calculate the arc length and arc measure intercepted by central angles. 3. I can define a radian measure HSA-CED.A.2 HSA-SSE.A.1,1.b HSG-C.A.2,3

HSG-SRT.B.5 HSG-SRT.C.6,7,8 HSN-Q.A.2,3	HSA-SSE.A.1.a,1.b HSF-IF.C.7.b HSG-GMD.A.1,3 HSG-GMD.B.4 HSG-MG.A.1,2,3 HSG-SRT.C.8 HSN-Q.A.1	HSG-C.B.5 HSG-CO.C.9,10 HSG-GMD.A.1 HSG-MG.A.3 HSG-SRT.B.5 HSG-SRT.C.8 HSN-Q.A.1