

CURRICULUM GUIDE
TO
GEOMETRY COMMON CORE

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UNIT I: Coordinate Geometry (8 days)
***days include one review day and one test day**

Textbook	Concept/Skill	Timeline	Standards
	Coordinate Geometry Formulas <ul style="list-style-type: none"> Slope of a line 	1 day	G.GPE.5 A
	Equation of a line <ul style="list-style-type: none"> Slope-intercept form Point-slope form Parallel and perpendicular lines Given a point and the equation of a line perpendicular Given a point and the equation of a line parallel 	2 days	G.GPE.5 B
	Coordinate Geometry Formulas <ul style="list-style-type: none"> Midpoint of a line segment Equation of perpendicular bisector 	2 days	
	Coordinate Geometry Formulas <ul style="list-style-type: none"> Length of a line segment 	1 day	

UNIT II: Basics (22 days)

Textbook	Concept/Skill	Timeline	Standards
	<ul style="list-style-type: none"> Undefined and Defined Terms -Point, line, plane Vocabulary (include symbols) -Collinear, line segment, congruent, midpoint, bisector of a line segment, bisector of an angle, ray, vector, angles (acute, obtuse, right, straight), linear pair, perpendicular lines, distance from a point to a line, triangles (scalene, isosceles, equilateral), complementary angles, supplementary angles, vertical angles, adjacent angles, median of a triangle, altitude of a triangle, exterior angle of a triangle, tangent to a circle, circumscribed, inscribed and regular polygons. Points of concurrency. Triangle inequality theorems. <p>*Include in the vocabulary unit: how to name a line segment, how to name a line, how to name an angle (using letters and numbers), how to mark congruent parts.</p>	8 days	G.CO.1 G-CO.12 G.CO.9 G.CO.10 G.CO.12 G.CO.13
	<ul style="list-style-type: none"> Properties and Theorems -Sum of the angles of a triangle are 180 degrees, isosceles triangle theorem, vertical angles are congruent, exterior angle theorem, sum of the interior and exterior angles of a polygon -Algebra and explain 	2 days	
	<ul style="list-style-type: none"> Parallel Lines -Algebra 	2 days	
	<ul style="list-style-type: none"> Basic Constructions -Copy a line segment, isosceles triangle, equilateral triangles, copy an angle, angle bisector, segment bisector, perpendicular line (through a point on the line, through a point not on the line), perpendicular bisector, median of a triangle, altitude of a triangle, square, 	8 days	

	<p>parallel lines. Square, regular hexagon, and equilateral triangle inscribed in a circle. These constructions should be applied to others throughout the school year (example: construct a line that is tangent to a circle is the same as constructing a perpendicular line through a point. Construct the points of concurrency.</p>		
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UNIT III: Congruent Triangles (18 days)

Textbook	Concept/Skill	Timeline	Standards
	Properties and Postulates (include mini proofs) <ul style="list-style-type: none">• Define Postulate and Theorem• Reflexive Property• Symmetric Property• Transitive Property• Substitution Postulate• Partition Postulate• Addition Postulate• Subtraction Postulate• Multiplication Postulate• Division Postulate	2 days	G.SRT.5A G.SRT.5B
	Congruent-Define and Recognize Using Rigid Motions <ul style="list-style-type: none">• SSS• SAS• ASA• AAS• HL	3 days	
	Two-Column Proofs <ul style="list-style-type: none">• Involving triangle congruence• Corresponding parts of congruent triangles are congruent	6 days	
	Overlapping Triangles Double Triangle Congruence	5 days	

UNIT IV: Parallel Lines (6 days)

Textbook	Concept/Skill	Timeline	Standards
	<ul style="list-style-type: none">• Proving parallel lines• Proofs using parallel lines	5 days	G.CO.C.9 G.CO.D.12

UNIT V: Transformations (17 days)

Textbook	Concept/Skill	Timeline	Standards
	<p>Transformational Geometry (include the concept that a transformation is a function ~input to an output)</p> <ul style="list-style-type: none"> • Pt Reflections • Line Reflections <ul style="list-style-type: none"> -students need to know that the perpendicular bisector is also known as the line of reflection -construct the line of reflection -construct a figure given the line of reflection • Translations (include the line that you are moving along, if not on a coordinate plane) <ul style="list-style-type: none"> -students need to know that translations involve constructing parallel lines -Find the point on a line segment that partitions the segment into a given ratio (algebraically and using constructions) • Rotations <ul style="list-style-type: none"> -the students need to know that the intersection of the perpendicular bisectors of the segments connecting the corresponding points of the pre-image and the image finds the center of rotation (Module 1 pages 127 -129) -given a center of rotation and degree measure, construct the image • Rotational Symmetry <ul style="list-style-type: none"> -Between 0 degrees and 360 degrees (non-inclusive) -Include rotational symmetry of polygons. Students should be able to determine the angle of rotation. • Reflections and Rotations that carry a figure onto itself (regular and irregular) • Rigid Motions <ul style="list-style-type: none"> -Rigid motions preserve angle measure and distance -Students should be able to identify if there is a rigid motion that will map one figure onto another -Ensure students are able to identify corresponding parts after 	15 days	G.CO.2 G.CO.3 G.CO.4 G.CO.5 G.CO.6 G.CO.7 G.CO.8 G-SRT.5 G.GPE.6

	<p>transformations occur.</p> <ul style="list-style-type: none"> • Using transformations determine if pre-image and image are congruent • Compositions of transformations -Students should be able to identify the composition of transformations as well as, identify one single transformation that would be equivalent to the composition. 		
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Teaching Notes

Teachers are expected to use software and transparencies to demonstrate transformations. Include examples of transformations that do not preserve angle measure and/or congruence.

Unit VI: Similarity (20 days)

Textbook	Concept/Skill	Timeline	Standards
	<p>Dilations</p> <ul style="list-style-type: none"> -The center of dilation and scale factor must be mentioned -A dilation takes a line not passing through the center of the dilation to a parallel line -A dilation leaves a line passing through the center unchanged -Constructions of dilations <p>**MIDTERM REVIEW**</p> <p>Similar Triangle Proof-include the concept of dilation</p> <ul style="list-style-type: none"> • AA Similarity • SSS Similarity • SAS Similarity • Corresponding Sides of Similar Triangles are in Proportion • Product of Means/ Extremes <p>Similarity and Proportions</p> <ul style="list-style-type: none"> • Ratio and Proportion <ul style="list-style-type: none"> -Mean Proportional/Geometric Mean • Proportions Involving Line Segments <ul style="list-style-type: none"> -A line segment drawn connecting two sides of triangle is parallel to the third side if and only if it divides the triangle proportionally -altitudes -medians -angle bisectors -areas -perimeters -volumes -Include the theorem “The segment connecting the midpoints of two sides of a triangle is parallel to the third side and half the measure of the length of the third side.” • Similar Polygons 	<p>5 days</p> <p>3-days</p> <p>5 days</p>	<p>G.SRT.1A G.SRT.1B G.SRT.2 G.SRT.3 G.SRT.4 G-SRT.5 G.SRT.6 G.SRT.7 G.SRT.8</p>
	<p>Similarity Transformations</p> <ul style="list-style-type: none"> • Explain similarity transformations as the 	2 days	

	equality of all corresponding pairs of angles and proportionality of all corresponding pairs of sides		
	Right Triangles <ul style="list-style-type: none"> • Proportions in Right Triangle • Pythagorean Theorem Proof using similarity 	2-days 1-day	

UNIT VII: Trigonometry (10 days)

Textbook	Concept/Skill	Timeline	Standards
	<ul style="list-style-type: none">• Pythagorean Theorem• Trigonometric Ratios• Use trig ratios and the pyth. thm. to solve right triangles in applied problems.• Cofunctions<ul style="list-style-type: none">-Sine and Cosine only-$\sin(x) = \cos(90-x)$-students have to mention complementary! (June 2016)	3 days 3 days 2 days	G.SRT.7 G.SRT.8

UNIT VIII: Quadrilateral Properties (21 days)

Textbook	Concept/Skill	Timeline	Standards
	Properties of Quadrilaterals <ul style="list-style-type: none">• Trapezoid (definition: a quadrilateral with at least one pair of parallel sides)• Isosceles trapezoid• Parallelogram• Rectangle• Rhombus• Square	3 days	G.CO.11 G.GPE.4 G.GPE.5C
	Coordinate Geometry Proof: Triangles and Quadrilaterals <ul style="list-style-type: none">• Numerical and Variable -using a compass -including not proofs	6 days	
	Two-Column/Paragraph Parallelogram Proofs <ul style="list-style-type: none">• Using parallelogram, rectangle, rhombus, and square properties• Proving a parallelogram, rectangle, rhombus, and square	10 days	

Unit IX: Three-Dimensional Geometry (15 days)

Textbook	Concept/Skill	Timeline	Standards
	<p>Three-Dimensional Figures</p> <ul style="list-style-type: none"> Identify the shapes of 2D cross sections of 3D objects Identify 3D objects generated by rotations of 2D objects Area and perimeter <ul style="list-style-type: none"> -Area of a triangle (using sine formula) -Include using the distance formula Volume of a Prism, pyramid, cylinder, cone, sphere <ul style="list-style-type: none"> -students should be able to dissect any figure for example, removing the bottom portion of a cone will result in a frustum -informal limit arguments Use geometry shapes and their measures and properties to describe objects (for example, a human torso is a cylinder) Apply geometric methods to solve design problems. (for example, designing a structure with a physical constraint) Apply concepts of density based on area and volume in modeling Population Density 	13 days	<p>G.GMD.1 G.GMD.3 G.GMD.4 G.MG.1 G.MG.2 G.MG.3 G.SRT.9 G.GPE.7</p>

Unit X: Geometry of a Circle (17 days)

Textbook	Concept/Skill	Timeline	Standards
	<p>Arc Length</p> <ul style="list-style-type: none"> Distance around a circular arc Give an informal argument for the formulas for circumference and area of a circle Find the radian measure of an angle $1 \text{ radian} = \frac{180}{\pi} \text{ degrees}$ Find the degree measure of an angle $1 \text{ degree} = \frac{\pi}{180} \text{ radians}$ S = θ r <p>Area of Sectors</p> <ul style="list-style-type: none"> Derive the formula 	5 days	G.CO.1 G.C.1 G.C.2A G.C.2B G.C.5 G.GMD.1 G.GPE.1A G.GPE.1B G.GPE.4
	<p>Equation of a Circle</p> <ul style="list-style-type: none"> Completing the square -fractional radius Derive the equation of a circle of given center and radius using the Pythagorean theorem Use completing the square to find the center and radius of a circle Knowing if a point lies on the circle <p>Angles</p> <ul style="list-style-type: none"> Arcs and Angles Inscribed Angles and their Measure Angles formed by Tangents, Secants and Chords 	2 days 3 days	
	<p>Segments</p> <ul style="list-style-type: none"> Arcs and Chords Tangents and Secants Measure of Tangent Segments, Chords and Secant Segments 	2 days	
	<p>Circle Proofs</p> <ul style="list-style-type: none"> All circles are similar 	3 days	

Unit XI: Regents Review (9 days)

Textbook	Concept/Skill	Timeline	Standards
	Regents Review	9 days	

References

Drance, D. (2014, April). *Common Core-izing HS Math*. Paper presented at Western Suffolk Boces.

Geometry Standards Clarification. (n.d.). Retrieved July 2, 2014, from Engage NY website:

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Larson, R., & Boswell, L. (2015). *Geometry*. Erie, PA: Big Ideas Learning.

Appendices