

Honors Geometry Course Outline Fall Semester (2015-16)

Text references are for *Geometry for Enjoyment and Challenge*, unless otherwise indicated. "Green Book" is Houghton/Mifflin Course 2.

15 days Sept 10 - 30	Logic, Basic Theorems and Triangle Congruence. Includes basic logic (statements, negations, con/dis-junction, conditionals, converse, inverse, contrapositive) as well as geometric definitions and theorems through congruence. Congruence as a sequence of rigid motions.
11 days Oct. 1 - 16	Cevians (supplement and 14.3): constructions (angle bis, perp. bis), cevians and concurrence. Isos triangles. Double congruence proofs Voronoi diagrams. Symmetry/locus – define isos, equil by symmetry constructions of reflections, reflections over a line
10 days Oct. 19 – 30	Quadratic Equations Review linear eqtns, factoring, solving by square roots, completing the square, and quadratic formula, also calculator problems with quadratic formula and applications. Linear Quadratic systems
13 days Nov 2 - 19	Parallels (Ch 5, 6 and handouts) and Polygons (Ch 7): parallel definition, parallel postulate construction, parallel thms, triangle angle sum. Polygons including constructions, indirect proofs.
12 days Nov 20 - Dec. 10	Quadrilaterals (Ch. 5): Definitions and properties, geogebra constructions, transformation symmetry, midpoints of quads trapezoid median theorem.
15 days Dec. 11 - Jan. 11	Coordinate Geometry (supplement with Ch 12 - green book): mdpt, dist formula, slope, perpendicular slopes, demonstrations perp bisector, transformations (<i>supplement</i>). Using geogebra for transformations. Compositions of transformations. Construct translations, rotations, vectors, sub-dividing a segment, non-origin based transformations
11 days Jan. 12 – Feb 2	Non-Euclidean Geometry Parallel definitions (<i>non-intersecting v. equidistant v. transversal symmetry</i>), spherical (global) and hyperbolic geometry*, 3-D geometry, Develop concepts of lines and angles on non-euclidean surfaces. Use google earth for sphere, tessellations and torus. Discuss transformations.

Spring Semester

<p>12/13 days (+ 1 for AMC = 13) Feb 3 - 24</p>	<p>Similar Polygons (8.1) ratio, proportion, geom. and harmonic mean (8.2) similarity, ratio of perimeters (8.3) proving similar triangles AA, SAS, SSS (8.4) CSSTP, CASTC (8.5) parallel proportional thm, 3-parallel thm, angle bis thm, golden ratio, golden rectangle, project. Dilations. Scale factors</p>
<p>12 days Feb. 25 – Mar. 11</p>	<p>Pythagorean Theorem - Right Triangles (9.1) simplify radicals, solve quadratics by factoring, square roots (9.2) circles, area, arc length (9.3) right triangle corollaries, (9.4) pyth thm (9.6) pyth triples (9.7) special triangles (9.8) pyth thm in 3-D (9.9) trig (9.10) more trig,</p>
<p>13 days Mar. 14 – 30</p>	<p>Circles (10.1) radius/chord thms (10.2) congruent chords (10.3) congruent arcs and chords (10.4) secants, tangents (10.5) inscribed angles, tan/chord angles (10.6) angles inside/outside (10.7) inscribed/circumscribed circles (10.8) power thms (10.9) circumference and arc length, sector area also 9.2 and radians, arc length</p>
<p>13 days Mar 31 – Apr. 18</p>	<p>Conics (Ch 12-7, 12-8) Green text: As in text include locus/focus references. Add conics centered off origin. Add 12-1 (transformation form of parabola) as well as 12-7 and 12-8 (ellipses and hyperbolas). Students should be able to go both ways from graph to equation. Also discuss solving for intercepts. Be sure to include extensive work with locus including 12-5.</p>
<p>15 days April 19 – May 16</p>	<p>Surface Area and Volume (Ch 11 and 12) 11.3) trapezoids (11.4) kites, rhombuses (11.5) regular polygons (11.6) circles, sectors (11.7) areas of similar objects, objects w/ same base (12.1) Surface area prisms (12.2) surface area pyramids (12.3) surface area cylinders, cones, spheres (12.4) volume of prisms and cylinders (12.5) volumes of pyramids and cones (12.6) volumes of spheres, volumes of similar objects, polyhedra. Cavalieri's principle, modeling, density, volume of rotation, units/conversions.</p>
<p>17 days May 17 – June 9</p>	<p>Review for Final Exam (handouts): topical review of critical chapters.</p>

+ 5 unassigned days