

SCHOOL DISTRICT U-46
Geometry and Geometry with Support (GWS)

Teacher Companion for Pacing Guide
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GEOMETRIC STRUCTURES	Chapter 1	Tools of Geometry
	Chapter 2	Reasoning and Proof
	Chapter 3	Parallel and Perpendicular Lines
CONGRUENCE	Chapter 4	Congruent Triangles
	Chapter 5	Relationships in Triangles
	Chapter 6	Quadrilaterals
SIMILARITY	Chapter 7	Proportions and Similarity
	Chapter 8	Right Triangles and Trigonometry
	Chapter 9	Transformations
TWO AND THREE DIMENSIONAL MEASURE	Chapter 10	Circles
	Chapter 11	Areas of Polygons and Circles
	Chapter 12	Extending Surface Area
	Chapter 13	Extending Volume

CHAPTER 1 TOOLS OF GEOMETRY

<i>Section (Standard)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
1-1 (9.11.04)	Points, Lines and Planes Basic Geometry Vocabulary	Focus on students mastery of terms and definitions	
1-2 (7.11.01, 7.11.03 7.11.05)	Linear Measure and Precision Measuring segments with rulers Congruence	Terminology is very important. AB vs. \overline{AB} Metric and U.S. measurements The concept of precision may be skipped.	
1-3 (7.11.05, 9.11.09, 9.11.11)	Distance and Midpoints Distance Formula Midpoint Formula Segment Bisector	May need to review coordinates. Also Pythagorean Theorem	
1-4 (7.11.03)	Angle Measure Angle terms Angle measures Angle bisectors	Constructions are optional	
1-5 (9.11.05)	Angle Relationships Angle Pairs Perpendicular	Students need to master these concepts	
1-6 (7.11.03, 7.11.05, 7.11.06)	Two Dimensional Figures Concave and Convex polygons Regular polygons Areas of polygons	Hit quick and retreat. This comes up again in Chapter 11	
1-7 (7.11.03, 7.11.05, 7.11.06)	Three Dimensional Figures Surface area of Solids Volumes of Solids	Hit quick and retreat. This comes up again in Chapter 12	

CHAPTER 2 REASONING AND PROOF

<i>Section (Standard)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
2.1 (9.11.17) (9.11.18)	Inductive Reasoning and Conjecture Educated guess, false examples, reasoning Vocabulary: Conjecture and counterexample	Use patterns, counterexamples should be algebraic	
2.2 (9.11.17)	Logic How to read and write conjunctions and disjunctions Vocabulary: statement and negation	No truth tables, may have difficulty reading	
2.3 (9.11.17)	Conditional Statement Conditional statement and its converse Vocabulary: hypothesis conclusion, converse	Watch true geometric meaning of hypothesis, watch for confusing hypotenuse with hypothesis, skip logically equivalent	
2.4 optional	Deductive Reasoning	Optional	
2.5 (9.11.17)	Postulates and Paragraph Proofs Types of proof initial postulates Vocabulary: Postulate and theorem	Know difference between postulate/theorem, be able to apply postulates and theorems	
2.6 (9.11.17)	Algebraic Proofs Know and apply properties of real numbers Vocabulary: two column proof	Justify the steps in solving an algebraic problem	
2.7/ 2.8 (9.11.17)	Proving Segment Relationships Writing proofs involving segment and angle addition V: supplementary, complementary and vertical angles Proving Angle Relationships	Combine 2.7 and 2.8, properties basically same switching angle and segment	

CHAPTER 3 PARALLEL AND PERPENDICULAR LINES

<i>Section (Standard)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
3-1 (9.11.04)	Parallel Lines and Transversals >Transversal, skew lines, > consecutive interior angles, > alternate interior and exterior angles, corresponding angles	<ul style="list-style-type: none"> • Watch for students who confuse consecutive and corresponding (same beginning of words) • Use jump ropes to model lines as a kinesthetic activity 	
3-2 (9.11.16) (9.11.17)	Angles and Parallel Lines <ul style="list-style-type: none"> • Parallel \rightarrow corresponding angles \cong postulate • Parallel \rightarrow alternate interior angles \cong theorem • Parallel \rightarrow alternate exterior angles \cong theorem • Parallel \rightarrow corresponding angles \cong theorem • Line perpendicular to one of 2 parallel lines is perpendicular to the other line 	<ul style="list-style-type: none"> • Focus on application problems, deemphasize proofs. • Give problem 24 or 25, word problems on PSAE. 	
3-5 (9.11.16, 9.11.17)	Proving Lines Parallel <ul style="list-style-type: none"> • Converse of postulates and theorems from section 3-2 <p>* Order is Different</p>	<p>* Since these are converse statements for the theorems and postulates for 3-2 and we thought it best to do these sections back-to-back.</p> <ul style="list-style-type: none"> • Don't assign problems 18 and 19 since we have not covered slope yet • Focus on application problems, deemphasize proofs. 	
3-3 (9.11.07)	Slopes of Lines <ul style="list-style-type: none"> • Slope, rate of change, slope formulas. • For non-vertical lines: same slope \leftrightarrow parallel opposite reciprocal slope \leftrightarrow perpendicular lines 	<ul style="list-style-type: none"> • Be sure to include graphing lines on graph paper 	
3-4 optional	Equations of Lines	Optional	
3-6 optional	Perpendicular and Distance	Optional	

CHAPTER 4 CONGRUENT TRIANGLES

Section (Standard)	Math Skills and Concepts	Comments	Assignments and Teacher Notes
4.1 (9.11.04)	Classifying Triangles Classifying types of triangles by sides and angles Vocabulary: acute, obtuse, right, scalene, isosceles, equilateral, equiangular, hypotenuse, leg	Emphasize <u>at least</u> 2 sides congruent in isosceles triangles Introduce parts of a right triangle	
4.2 (9.11.05)	Angles of Triangles Angle relationships of a triangle Vocabulary: Remote interior angle, exterior angles	Sum of the angles of a triangle is 180 Exterior Angle Theorem SKIP flow proofs	
4.3 (9.11.13) (9.11.02)	Congruent Triangles Name and label congruent triangles and its parts Vocabulary: congruent triangles	Discuss basic transformations (flip, slide, rotate) Introduce CPCTC	
4.4 (9.11.16)	Proving Congruence (SSS, SAS) Using SSS and SAS to prove triangles congruent Vocabulary: Included angle	Supplementary materials may be needed for mastery, especially for GWS	
4.5 (9.11.16)	Proving Congruence (ASA, AAS) Using ASA and AAS to prove triangles congruent Vocabulary: Included side	Supplementary materials may be needed for mastery, especially for GWS	

<i>Section (Standard)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
4.5 extension (9.11.16)	Use HL to prove right triangles congruent	SKIP LL, HA, LA	
4.6 (9.11.04) (9.11.08)	Isosceles Triangles Properties of isosceles and equilateral triangles Vocabulary: vertex angle, base angle		
4.7 (9.11.11) (9.11.09) (9.11.08)	Triangles and Coordinate Proof Using properties of triangles on a coordinate plane	For GWS do problems with numbers in the coordinates instead of variables	

CHAPTER 5 RELATIONSHIPS IN TRIANGLES

<i>Section (Standard)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
5.1 (9.11.05) (9.11.09)	Bisectors, Medians, and Altitudes Identify special segments of a triangle Vocabulary: Perpendicular bisector, medians, angle bisector of a triangle	Too much vocabulary for mastery Supplementary materials will be needed Do example with compass with Theorems 5.3 (circumscribed) and 5.6 (inscribed) Balance centroid example	
5.2 (9.11.05)	Inequalities and Triangles Using inequalities to look at the relationship between angles and sides of triangles	Good lab Algebra review properties from 4.6 Angles opposite congruent sides are congruent, and vice versa	
5.4 (6.11.15) (9.11.05)	The Triangle Inequality Determine if its a triangle, ranges for the length of the third side	Shortest distance to a point is a straight line	

CHAPTER 6 QUADRILATERALS

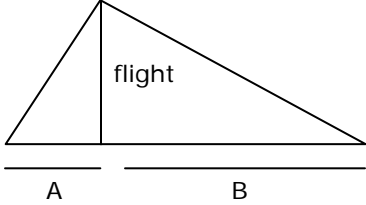
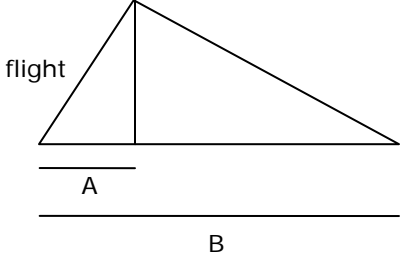
<i>Section (Standard)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Homework and TeacherNotes</i>
6.1 (9.11.05) (7.11.03)	Angles of Polygons Sum of interior and exterior angles of a polygon	Teach all formulas including measure of One interior angle $(n-2)180/n$ Interior angle sum $(n-2)180$ One exterior angle $360/n$ Exterior angle sum 360 Refer to pg. 50 (1.6 review)	
6.2 (9.11.05)	Parallelograms Properties of parallelograms		
6.3 (9.11.05)	Tests for parallelograms Proving a quadrilateral is a parallelogram	5 different tests	
6.4 (9.11.04) (9.11.05)	Rectangles Properties of rectangles	Skip construction Use distance and slope to determine if coordinates form a rectangle For GWS deemphasize the coordinate geometry problems	
6.5 (9.11.04) (9.11.05)	Rhombi and Squares Properties of rhombi and squares Vocab: rhombus	Skip construction Use distance and slope to determine if coordinates form a rhombus or square For GWS deemphasize the coordinate geometry problems Emphasize that a square is always a rhombus but a rhombus is not always a square.	

<i>Section (Standard)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
6.5 extension (optional) (9.11.04) (9.11.05)	Kites Properties of kites	Optional	
6.6 (9.11.04) (9.11.05)	Trapezoids Properties of trapezoids Vocab: trapezoid, isosceles trapezoid, median of a trapezoid	Skip construction Use distance and slope to determine if coordinates form a trapezoid For GWS deemphasize the coordinate geometry problems Median = midsegment	
6.7 (9.11.11) (9.11.09) (9.11.08)	Coordinate Proof and Quadrilaterals Using properties of quadrilaterals on a coordinate plane	For GWS do problems with numbers in the coordinates instead of variables	

CHAPTER 7 PROPORTIONS AND SIMILARITY

Section (Standard)	Math Skills and Concepts	Comments	Assignments and Teacher Notes
7-1 (6.11.17)	PROPORTIONS Ratios/proportions Means, Extremes, Cross Products	Remind kids to use distributive property when needed Given 2:3:5 use 2x:3x:5x to write equation Same cross product \leftrightarrow equivalent proportions	
7-1 Extend optional	FIBONACCI SEQUENCE AND RATIOS (graphing calculator lab)	Optional	
7-2 (9.11.03, 9.11.12, 9.11.16)	SIMILAR POLYGONS Similar Polygons; Similarity statement; the symbol " \sim "; Scale factor	Emphasize corresponding parts; order of letters in \sim statement; Ratio of Perimeters; Suggestion: Bring in maps to supplement	
7-3 (7.11.05, 9.11.12, 9.11.16, 9.11.17)	SIMILAR TRIANGLES \sim Triangles Reflexive Property; Symmetric Property; Transitive Property Indirect Measurement	Show Triangles are similar by AA \sim , SSS \sim , or SAS \sim	
7-4 (9.11.09, 9.11.05)	PARALLEL LINES AND PROPORTIONAL PARTS Mid-segment, proportions with mid-segments Proportional parts between parallel lines	Use midpoint and distance formulas Look at the separating the triangles to see the corresponding parts Construction: trisect a segment	
7-5 (7.11.06, 6.11.17, 9.11.05, 9.11.12)	PARTS OF SIMILAR TRIANGLES Applying similar triangles Mean, altitude, angle bisector	In 2 \sim figures, all corresponding medians, altitudes, and angle bisectors are proportional. Angle Bisector Theorem Emphasize that angles stay the same measure, only sides change ratio	
7-5 Extend (optional)	SIERPINSKI TRIANGLE Lab	Optional	

CHAPTER 8 RIGHT TRIANGLES AND TRIGONOMETRY

Section (Standard)	Math Skills and Concepts	Comments	Assignments and Teacher Notes
8.1 (9.11.12)	<p>GEOMETRIC MEAN -Geometric mean -Solving altitude-on-hypotenuse problems</p> 	<p>-Review square roots and radicals <u>before</u> this section (p. 790-791) -point out the difference between Algebraic mean and geometric mean -relate geometric mean to the proportions used in similar triangles -Parachute Pete says: $flight^2 = optionA \bullet optionB$</p> 	
8.2 (9.11.01)	<p>PYTHAGOREAN THEOREM AND ITS CONVERSE -pythagorean theorem -pythagorean triples -converse of pythagorean theorem</p>	<p>-show various proofs of the Pythagorean theorem or have them prove it with pictures -point out that: $a^2 + b^2 < c^2$ means obtuse triangle $a^2 + b^2 > c^2$ means acute triangle -use $leg^2 + leg^2 = hyp^2$ instead of the formula in the book in order to emphasize where each number is plugged into the formula</p>	

<i>Section (Standard)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
8.3 (9.11.19) (9.11.20)	SPECIAL RIGHT TRIANGLES - 45-45-90 triangles - 30-60-90 triangles	-minimum of 2 days -emphasize properties of isosceles triangles (congruent angles, congruent sides) when teaching 45-45-90s -use Pythagorean theorem to find missing sides to show connection to last section -find patterns among the triangles -GWS – emphasize the basic special triangles only	
8.4 (9.11.19) (9.11.22)	TRIGONOMETRY -trig ratios – sine, cosine, tangent -find sides of triangles using trig functions -find angles using inverse operations	-SOHCAHTOA $S = \frac{O}{H}, C = \frac{A}{H}, T = \frac{O}{A}$ -emphasize the sides of triangle (opposite, adjacent, hypotenuse) -break down into 2 days - Day 1: ratios and sides - Day 2: angles	
8.5 (9.11.19) (9.11.20)	ANGLES OF ELEVATION AND DEPRESSION -angle of elevation -angle of depression	-the angle is <u>always</u> the angle formed with the <u>horizontal</u> line (not the vertical)	
8.6 Optional	THE LAW OF SINES	Optional	
8.7 Optiona	THE LAW OF COSINES	Optional	

CHAPTER 9 TRANSFORMATIONS
(OPTIONAL – END OF YEAR IF TIME??)

<i>Section (Standard)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
9.1 optional	REFLECTIONS	Optional	
9.2 optional	TRANSLATIONS	Optional	
9.3 optional	ROTATIONS	Optional	
9.4 optional	TESSELLATIONS	Optional	
9.5 optional	DILATIONS	Optional	
9.6 optional	VECTORS	Optional	

CHAPTER 10 CIRCLES

<i>Section (Standard)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
10.1 (9.11.10, 9.11.15)	CIRCLES AND CIRCUMFERENCE -use parts of a circle -circumference	Diagram on p. 554 Optional Geo Lab on p. 556 (find pi) GWS Concentric circles p. 559 #60	
10.2 (9.11.10)	MEASURING ANGLES AND ARCS -central angles -different types of arcs -arc length	Stress p. 564 (guided notes for example) Review of proportions helpful for arc length	
10.3 (9.11.10, 9.11.15)	ARCS AND CHORDS -relationships between arcs, chords, and diameter -inscribed/circumscribed	Geo Lab p. 573 (patty paper & compass) -Use in place of lecture?? Concentric circle application with CDs p.576	
10.4 (9.11.10, 9.11.15)	INSCRIBED ANGLES -inscribed angle theorem -inscribed polygons (find angles)	Use Lab on p. 578 as introduction?? (Geometer Sketchpad p. 588) Diagram p.578 & p.579 Remind 360° in full circle	
10.5 (9.11.01, 9.11.10, 9.11.15)	TANGENTS -use tangents -identify tangents -circumscribed polygons	Right Triangle – Pythagorean Thm. Review Geometer’s Sketchpad p.588 Construction optional p. 592	
10.5 Extend Optional	INSCRIBED AND CIRCUMSCRIBED TRIANGLES	Optional	
10.6 (9.11.10)	SECANTS, TANGENTS, AND ANGLE MEASURE -Special angle measures -Match diagrams with formulas	Formulas – have students show work Different cases – vertex of angle(s) inside, on, or outside of circle	
10.7 (9.11.10, 9.11.15) Optional	SPECIAL SEGMENTS IN A CIRCLE -secants, chords, and tangents	Optional Focus on segment relationships (angles from 10.6 ignored)	
10.8 (9.11.10, 9.11.20) optional	EQUATIONS OF CIRCLES -write basic formula of circle on coordinate plane	Optional Covered in Algebra 3-4 & Pre-calculus On ACT	

CHAPTER 11 CIRCLES

<i>Section (Chapter)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
11-1 (7.11.03, 9.11.01, 9.11.05, 9.11.20)	Areas of Parallelograms Find the area and perimeter of parallelograms. Use slope and distance formulas to determine whether points create a parallelogram, rectangle, or square in the coordinate plane.	Refresh topics of Special Right Triangles, Distance Formula, Slope Formula	
11-2 (7.11.03, 9.11.01, 9.11.05, 9.11.20)	Areas of Triangles, Trapezoids, and Rhombi Find the areas of triangles, trapezoids and rhombi. Use the distance formula to find the areas of trapezoids and rhombi in the coordinate plane.	Distance Formula	
11-3 (7.11.03, 9.11.01, 9.11.05, 9.11.15, 9.11.20)	Area of Regular Polygons and Circles Define apothem. Find the area of regular polygons. Find the area of a circle. Combine these concepts to find the area of an inscribed polygon.	Special Right Triangles Central Angles Inscribed Circles Regular Polygons Trig Ratios	
11-5 (7.11.03, 9.11.01, 9.11.05, 9.11.10 9.11.15, 9.11.20) (10.11.09)	Area of Sectors Find the area of Sectors and Segments of Circles. Optional: Geometric Probability	Special Right Triangles Arc Measure	
11-4 (7.11.03, 9.11.01, 9.11.05, 9.11.10 9.11.15, 9.11.20)	Area of Composite Figures Find the area of Composite Figures. Find the area of Composite Figures in the coordinate plane.	Special Right Triangles Auxiliary Line	

CHAPTER 12 EXTENDING SURFACE AREA

<i>Section (Chapter)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
12-1 (9.11.07, 9.11.06)	Representations of Three-Dimensional Figures Draw three-dimensional objects using corner-view and perspective-view. Cross-sections of three-dimensional figures	Pictorial representation using nets. Teaching the students HOW to draw in three dimensional.	
12-2 (7.11.03)	Surface Area of Prisms Define Prism. Identify lateral faces, lateral edges. Right Prisms. Find Lateral Area and Surface Area of Prisms.	Place a strong emphasis on determining which two polygons define the bases, and the difference between height of base versus height of prism. Need a good understanding of Perimeter and Area. Use Pythagorean Theorem to find unknown lengths.	
12-3 (7.11.03)	Surface Area of Cylinders Define Cylinder. Identify axis, altitude, bases. Right Cylinders. Find Lateral Area and Surface Area of Cylinders.	Refresh Area and Properties of Circles.	
12-4 (7.11.03)	Surface Area of Pyramids Define Pyramid, Regular Pyramid. Identify slant height, lateral edge, vertex, altitude. Find the Lateral Area and Surface Area of Regular Pyramids.	Understanding of Perimeter and Area. Use Pythagorean Theorem to find unknown lengths. Strong focus on the properties and area of Regular Polygons.	
12-5 (7.11.03)	Surface Area of Cones Define Cone, Circular Cone, Oblique Cone and Right Cone. Identify axis, altitude, slant height. Find the Lateral Area and Surface Area of Cones.	Refresh Area and Properties of Circles. Use Pythagorean Theorem to find unknown lengths.	
12-6 (7.11.03)	Surface Area of Spheres Define Sphere. Identify basic properties: radius, chord, diameter, tangent. Define Great Circle, Hemisphere. Find the Surface Area of a Sphere.	Refresh Area and Properties of Circles.	

CHAPTER 13 EXTENDING VOLUME

<i>Section (Chapter)</i>	<i>Math Skills and Concepts</i>	<i>Comments</i>	<i>Assignments and Teacher Notes</i>
13-1 (7.11.03)	Volumes of Prisms and Cylinders Find the Volume of Prisms. Find the Volume of Cylinders. Understand Cavalieri's Principle (p731).	Know properties of circles, triangles and special quadrilaterals. Use Pythagorean Theorem to find unknown lengths.	
13-2 (7.11.03)	Volumes of Pyramids and Cones Find the Volume of Pyramids. Find the Volume of Cones.	Know properties of circles, triangles and special quadrilaterals. Use Pythagorean Theorem to find unknown lengths. Some problems require the use of special right triangles and trig ratios to find unknown lengths.	
13-3 (7.11.03)	Volumes of Spheres Find the Volume of Spheres. Find the Volume of Hemispheres.	Know properties of circles, triangles and special quadrilaterals.	
13-4 (7.11.05, 7.11.06) Optional		Optional	
13-5 (9.11.11, 9.11.09) Optional		Optional	