

LITCHFIELD PUBLIC SCHOOLS
CT(Core) Curriculum Scope and Sequence
Geometry

Essential Questions

How are quantitative relationships represented by numbers?

How can collecting, organizing and displaying data help us analyze information and make reasonable predictions and informed decisions?

How do geometric relationships and measurements help us to solve problems and make sense of our world?

How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?

	CT Frameworks/Standards	Content and Skill Objectives Students will be able to:	Assessments	Resources
UNIT 1 LINES & ANGLES 11 WEEKS	CT(Core) 3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems. CT(Core) 3.1a(1) Use models and constructions to make, test and summarize conjectures involving properties of geometric figures. CT(Core) 3.1a(2) Use geometric properties to solve problems in two and three dimensions. CT(Core) 3.2(a) Verify geometric relationships using algebra, coordinate geometry and transformations. CT(Core) 3.2a(1) Interpret geometric relationships using algebraic	<u>Points, Lines & Planes</u> 1. Understand basic terms & postulates of geometry. 2. Identify, label & draw points, lines, planes, segments, rays and angles. 3. Identify objects in the world that model points, lines, planes, segments, rays and angles. 4. Calculate or measure lengths of segments on the number line and on the coordinate plane (Pythagorean Theorem). 5. <i>(HG-Calculate or measure lengths of segments on the coordinate plane using the Distance Formula).</i> 6. Calculate the midpoint of a segment on the number line and on the coordinate plane. 7. Classify measure and draw angles. 8. Identify & use congruent angles & bisectors. 9. Use a protractor to draw an angle bisector. 10. Identify special angle pairs (VALCS) vertical, adjacent, linear pair, complementary & supplementary angles. 11. Solve (word) problems containing them.	Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests <u>Geometer's Sketchpad</u> -Introduction -Measure Segment -Measure Angles -Segment Addition SAP -Angle Addition AAP <u>CAPT Simulation</u> 3Level Pyramid	Textbook: <i>Glencoe Geometry@2005</i> Online resources: <i>Glencoe</i> worksheets used on the smart board. Geometer's Sketchpad TI-83 Graphing Calculator and SMARTBoard emulator CAPT released items

	<p>equations and inequalities. CT(Core) 3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure. CT(Core) 3.3 (a) Solve a variety of problems involving one- two- and three-dimensional measurements using geometric relationships and trigonometric ratios. CT(Core) 3.3 (a)1 Select appropriate units, scales, degree of precision, strategies to determine length, angle measure, perimeter, circumference and area of plane geometric figures.</p>	<p>12. Solve problems involving midpoints, angle bisectors, and perpendicular bisectors numerically & algebraically. 13. Solve problems involving Segment and Angle Addition Postulates. 14. Use algebra and a scientific calculator as needed. 15. Use relevant vocabulary, symbols and notation.</p>	<p>High 5 Bike Trip</p>	
	<p>CT(Core)3.1(b) Develop and evaluate mathematical arguments using reasoning and proof. CT(Core)3.1(b)1 Recognize the validity of an argument. CT(Core)3.1(b)2 Create logical arguments to solve problems and determine geometric relationships. CT(Extended) 3.1(a) Use methods of deductive and inductive reasoning to make, test and validate geometric conjectures.</p>	<p><u>Reasoning & Proof</u> 1. Recognize and write conditional statements, their converses, inverses and contra-positives. 2. Provide counterexamples to disprove conditional statements. 3. Provide valid conjectures for given information. 4. Recognize and write good definitions as biconditionals. 5. Connect algebraic and geometric reasoning through formal 2-column proofs. 6. Apply algebraic properties to problems and proofs. 7. Use inductive reasoning. 8. Use deductive reasoning. 9. Justify that an argument is valid or invalid</p>	<p>Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests Puzzle Proofs</p>	<p>Textbook: <i>Glencoe Geometry@2005</i> Online resources: <i>Glencoe</i> worksheets used on the smart board. Geometer's Sketchpad TI-83 Graphing Calculator and SMARTBoard</p>

	<p>CT(Extended) 3.1(a)1 Recognize the relationships between a conditional statement and its converse, inverse and contrapositive.</p> <p>CT(Extended) 3.1(a)2 Test the validity of logical arguments.</p> <p>CT(Extended) 3.1(a)3 Use deductive arguments, including direct and indirect proofs, to develop an understanding of an axiomatic approach to geometry.</p>	<p>by applying the Law of Syllogism or the Law of Detachment.</p> <p>10. Write formal and informal proofs.</p> <p>11. Apply appropriate properties, theorems and postulates to justify statements in formal and informal proofs.</p> <p>12. Prove lines parallel or not.</p> <p>13. Use relevant vocabulary, symbols and notation.</p>		<p>emulator</p> <p>CAPT released items</p>
<p>UNIT 1 Continued</p>	<p>CT(Core)3.2(a) Verify geometric relationships using algebra, coordinate geometry and transformations.</p> <p>CT(Core) 3.3(a)2 Use indirect methods including the <i>Pythagorean Theorem</i>, trigonometric ratios, and proportions in similar figures to solve a variety of measurement problems.</p> <p>CT(Extended) 3.2 Use spatial reasoning, location and geometric relationships to solve problems.</p> <p>CT(Extended) 3.2(a)2 Use <i>Cartesian</i>, navigational, polar and spherical systems to represent, analyze and solve geometric and measurement</p>	<p><u>Parallel & Perpendicular Lines</u></p> <ol style="list-style-type: none"> 1. Identify & name angles formed by lines and transversals. 2. Identify relationships among pairs of angles formed by lines (parallel) and transversals. 3. Use properties of parallel lines to calculate angle measures numerically and algebraically. <i>(HG-quadratic expressions)</i> 4. Use properties of parallel lines to calculate angle measures with parallel lines and crooked transversals numerically. <i>(HG – algebraically)</i> 5. Identify parallel & skew lines in three dimensional pictures. 6. Given a numeric slope, state the parallel and perpendicular slopes. 7. Draw the perpendicular distance from a point to a segment. 8. Apply properties of parallel lines to solve 	<p>Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests</p> <p><u>Geometer's Sketchpad</u> -Construct Perpendicular -Construct Parallel -Angles & Parallel Lines & Transversals -String Art</p>	<p>Textbook: <i>Glencoe Geometry@2005</i></p> <p>Online resources: <i>Glencoe</i> worksheets used on the smart board.</p> <p>Geometer's Sketchpad</p> <p>CAPT released items</p>

	problems.	<p>two column puzzle proofs. (<i>HG – no puzzle proofs</i>).</p> <ol style="list-style-type: none"> 9. Determine the slope from a graph and explain if lines are parallel, perpendicular, or neither. 10. Graph horizontal and vertical lines, then calculate the distance between the parallel lines. 11. (<i>HG – Graph parallel lines, then calculate the distance between the parallel lines</i>). 12. Use the Pythagorean Theorem, (<i>HG –or distance formula</i>), to calculate the distance on the coordinate plane between points and lines, and between two parallel lines. 13. Use properties of parallel lines to prove lines are parallel. 14. Use auxiliary lines to solve problems with crooked transversals. 		
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	CT Frameworks/Standards	Content and Skill Objectives Students will be able to:	Assessments	Resources
<p>UNIT 2</p> <p>TRIANGLES & CONGRUENCE</p> <p>11 WEEKS</p>	<p>CT(Core)3.2 Use spatial reasoning, location and geometric relationships to solve problems.</p> <p>CT(Core)3.2(a) Verify geometric relationships using <i>algebra</i>, coordinate geometry and transformations.</p> <p>CT(Core)3.2(a)3 Apply transformations to plane figures to determine <i>congruence</i>, similarity, symmetry and tessellations.</p> <p>CT(Core)3.3(a)2 Use indirect methods including the <i>Pythagorean Theorem</i>, trigonometric ratios, and proportions in similar figures to solve a variety of measurement problems.</p> <p>CT(Extended) 3.1 Use properties and characteristics of <i>two-</i> and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.</p>	<p><u>Congruent Triangles</u></p> <ol style="list-style-type: none"> 1. Classify triangles by sides and angles. 2. Illustrate and identify the parts of a right, and isosceles triangles. 3. Using algebraic expressions to classify a triangle by sides & angles and solve numeric, algebraic and word problems. 4. Apply the sum of the Angles of a Triangle Theorem to solve numeric, algebraic and word problems. 5. Identify, define and apply properties of exterior angles and remote-interior angles. 6. Identify & apply the Exterior Angle of a Triangle Theorem to solve numeric, algebraic and word problems. 7. Name & label corresponding parts of congruent triangles. 8. Identify congruence transformations. 9. Identify & solve congruent triangles. 10. Complete 2-column and paragraph proofs for triangle congruency using SSS, SAS, ASA postulates and AAS Theorem. 11. (<i>HG – HL Postulates and LL, HA, LA Theorems</i>). 12. Use properties of isosceles, equilateral, and right triangles to solve numeric, algebraic and word problems. 	<p>Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests</p> <p><u>CAPT Simulation</u> Paper Ranger Stair Railing</p> <p><u>Geometer’s Sketchpad</u> Sum Angles in Triangle Exterior Angle Triangle Quilt Project</p>	<p>Textbook: <i>Glencoe Geometry@2005</i></p> <p>Online resources: <i>Glencoe</i> worksheets used on the smart board.</p> <p>Geometer’s Sketchpad</p> <p>CAPT released items</p>

	CT Frameworks/Standards	Content and Skill Objectives Students will be able to:	Assessments	Resources
UNIT 2 continued	<p>CT(Core)3.2 Use spatial reasoning, location and geometric relationships to solve problems.</p> <p>CT(Core)3.2(a) Verify geometric relationships using <i>algebra</i>, coordinate geometry and transformations.</p> <p>CT(Core)3.2(a)1 Interpret geometric relationships using <i>algebraic equations</i> and <i>inequalities</i>, and vice versa.</p> <p>CT(Core)3.2(a)2 Describe how a change in measurement of one or more parts of a polygon or solid may affect its perimeter, area, surface area and volume and make generalizations for similar figures.</p>	<p><u>Relationships In Triangles</u></p> <ol style="list-style-type: none"> 1. Define & use concurrent lines to solve problems. 2. Identify and use medians, altitudes, and angle bisectors, (<i>HG-and perpendicular bisectors</i>) in triangles to solve problems. 3. Illustrate, identify and use circumcenter, incenter, centroid, and orthocenter in triangles to solve problems. 4. Recognize & apply properties of inequalities relating to the measure of angles and sides in a triangle. 5. Apply the Triangle Inequality Theorem. 6. (<i>HG-Use indirect proof with algebra & geometry</i>). 7. (<i>HG-Apply the SAS & SSS inequalities to two triangles</i>). 	<p>Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests</p> <p>Constructions.</p>	<p>Textbook: <i>Glencoe Geometry@2005</i></p> <p>Online resources: <i>Glencoe</i> worksheets used on the smart board.</p> <p>Geometer's Sketchpad</p> <p>CAPT released items</p>

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UNIT 2 continued	<p>CT(Core)3.2(a) Verify geometric relationships using <i>algebra</i>, coordinate geometry and transformations.</p> <p>CT(Core)3.2(a)3 Apply transformations to plane figures to determine congruence, <i>similarity</i>, symmetry and tessellations.</p> <p>CT(Core)3.3(a)2 Use indirect methods including the Pythagorean Theorem, trigonometric ratios and <i>proportions in similar figures</i> to solve a variety of measurement problems.</p> <p>CT(Core)3.3(a)3 Judge the reasonableness of answers to direct and indirect measurement problems.</p>	<p><u>Proportions & Similarity</u></p> <ol style="list-style-type: none"> 1. Write and solve ratios. 2. Use properties of proportions to solve numeric and algebraic problems. 3. Identify similar polygons & triangles. 4. Solve problems involving scale factor. 5. Apply ratio and proportion to solve problems with similar polygons & triangles. 6. Recognize & use proportional parts, corresponding perimeters, altitudes, angle bisectors, and medians of similar triangles to solve problems. 7. Use proportional parts of triangles to solve numeric and algebraic problems. 8. Divide a segment into equal parts. 9. Solve problems that involve the Triangle Midsegment Theorem. 10. Solve problems that involve the Angle Bisector Theorem. 11. <i>(HG – Recognize and describe characteristics of fractals).</i> 12. <i>(HG – Identify the characteristics of fractals).</i> 	<p>Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests</p> <p><u>CAPT Simulation</u> Ratio, rate, proportion Websterhousepub.com</p> <p><u>Geometer's Sketchpad</u> -Triangle Mid-segment</p>	<p>Textbook: <i>Glencoe Geometry@2005</i></p> <p>Online resources: <i>Glencoe</i> worksheets used on the smart board.</p> <p>Geometer's Sketchpad CAPT released items</p>

	CT Frameworks/Standards	Content and Skill Objectives Students will be able to:	Assessments	Resources
UNIT 2 continued	<p>CT(Core)3.3 Develop and apply units, systems, <i>formulas</i> and appropriate tools to estimate and measure.</p> <p>CT(Core)3.3(a) Solve a variety of problems involving <i>one-</i>, two- and three-dimensional measurements using geometric relationships and trigonometric ratios.</p> <p>CT(Core)3.3(a)2 Use indirect methods including the Pythagorean Theorem, trigonometric ratios and proportions in similar figures to solve a variety of measurement problems.</p> <p>CT(Core)3.3(a)3 Judge the reasonableness of answers to direct and indirect measurement problems.</p> <p>CT(Extended) 3.3 Develop and apply units, systems, <i>formulas</i> and appropriate tools to estimate and measure.</p> <p>CT(Extended) 3.3(a)2 Use properties of similarity and techniques of trigonometry to make indirect measurements of lengths and angles to solve a variety of problems.</p>	<p><u>Right Triangles and Trigonometry</u></p> <ol style="list-style-type: none"> 1. Find the geometric mean between two numbers. 2. Use the geometric mean to solve problems in right triangles with the altitude drawn to the hypotenuse. 3. Use the Pythagorean Theorem and its converse to solve problems. 4. Use properties of special right triangles (30-60-90) and (45-45-90) to solve triangles. 5. Apply properties of special right triangles to determine the missing sides of right triangles. 6. Solve problems using the relationship between the altitude to hypotenuse and other parts of right triangles. 7. <i>(HG –Use trigonometric ratios to solve right triangle problems).</i> 8. <i>(HG - Solve problems involving the angle of elevation & the angle of depression).</i> 	<p>Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests</p>	<p>Textbook: <i>Glencoe Geometry@2005</i></p> <p>Online resources: <i>Glencoe</i> worksheets used on the smart board.</p> <p>Geometer’s Sketchpad</p> <p>CAPT released items</p>

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UNIT 3 POLYGONS 4 WEEKS	3.1 CT(Core) Use properties and characteristics of <i>two</i> - and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems. CT(Core)3.1(a) Investigate relationships among plane and solid geometric figures using geometric models, constructions and tools. CT(Core)3.1(a)3 Determine and compare properties of classes of polygons. CT(Core)3.2 Use spatial reasoning, location and geometric relationships to solve problems. CT(Core)3.2(a) Verify geometric relationships using algebra, coordinate geometry and transformations. CT(Core)3.2(a)2 Describe how a change in measurement of one or more parts of a <i>polygon</i> or solid may affect its perimeter, area, surface area and volume and make generalizations for similar figures.	<u>Quadrilaterals</u> 1. Recognize & define parallelograms in general and special parallelograms. 2. Recognize & use properties of special parallelograms in problem application. 3. Recognize & apply properties of the sides and angles of parallelogram. 4. Recognize & apply properties of the diagonals of parallelograms. 5. Recognize the conditions that ensure a quadrilateral is a parallelogram. 6. <i>(HG – Prove that a set of points forms a parallelogram in the coordinate plane).</i> 7. Determine whether a parallelogram is a rectangle, rhombus, or square. 8. Recognize & apply the properties of rhombi, rectangles, squares, and trapezoids to solve problems. 9. Solve problems involving the medians of trapezoids. 10. Use algebraic applications to determine special parallelograms. 11. <i>(HG – Use and apply properties of inscribed polygons).</i> 12. Identify and name polygons and their parts. 13. Find the measures of interior and exterior angles of convex polygons and the sums of these angles. 14. Use angle measures of polygons in problem solving. 15. Discover formulas related to angles and diagonals of polygons.	Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests <u>CAPT Simulation</u> Math and a Sheet of Paper (Rectangle, Video) Mrs. Olsen’s Sidewalk Landscape Architect’s Design	Textbook: <i>Glencoe Geometry@2005</i> Online resources: <i>Glencoe</i> worksheets used on the smart board. Geometer’s Sketchpad CAPT released items

	<p>CT(Core)3.3(a)1 Select appropriate units, scales, degree of precision, and strategies to determine length, angle measure, <i>perimeter</i>, circumference and <i>area</i> of plane geometric figures.</p>	<p>16. Find areas of triangles parallelograms, trapezoids and regular polygons. 17. Find the areas of irregular polygons. 18. Find geometric probability.</p>		
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	CT Frameworks/Standards	Content and Skill Objectives Students will be able to:	Assessments	Resources
UNIT 4 CIRCLES 4 WEEKS	CT(Core)3.1(a)1 Use models and constructions to make, test and summarize conjectures involving properties of geometric figures. CT(Core)3.2 Use spatial reasoning, location and geometric relationships to solve problems. CT(Core)3.2(a) Verify geometric relationships using <i>algebra</i> , coordinate geometry and transformations. CT(Core)3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure. CT(Core)3.3(a) Solve a variety of problems involving one-, two- and three-dimensional measurements using geometric relationships and trigonometric ratios. CT(Core)3.3(a)1 Select appropriate units, scales, degree of precision, and strategies to determine length, angle measure, perimeter, <i>circumference and area</i> of plane geometric figures.	1. Identify, draw and use proper notation for the parts of a circle, (center, radius, diameter, chord, arc, sector, secant, and tangent). 2. Use a protractor & Geometer's Sketchpad to determine inscribed & central angle relationships. 3. Identify & illustrate major arcs, minor arcs, and semicircles. 4. Determine the measures of arcs in degrees and the linear length of arcs. 5. Find the circumference and the area of circles. 6. Find the radius or diameter given the area or circumference of a circle. 7. Find the area of sectors. 8. Find the measures of central & inscribed angles. 9. Calculate the angle measures of angles formed by a combination of chords, radii, segments, tangents. 10. Relationship of perimeter of regular polygons to circumference and area of circles. 11. Find the area of circles, sectors, <i>and (segments of circles)</i> .	Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests <u>CAPT Simulation</u> Hugo's Pizza Landscape Design <u>Geometer's Sketchpad</u> -Arc Addition AAP	Textbook: <i>Glencoe Geometry@2005</i> Online resources: <i>Glencoe</i> worksheets used on the smart board. Geometer's Sketchpad CAPT released items

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UNIT 5 PERIMETER , AREA, SURFACE AREA & VOLUME 4 WEEKS	<p>CT(Core)3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.</p> <p>CT(Core)3.1(a)2 Use geometric properties to solve problems in two and three dimensions.</p> <p>CT(Core)3.3(a) Solve a variety of problems involving one-, two- and three-dimensional measurements using geometric relationships and trigonometric ratios.</p> <p>CT(Core)3.3(a)4 Use two dimensional representations and formal and informal methods to solve surface-area and volume problems.</p> <p>CT(Extended) 3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.</p> <p>CT(Extended) 3.2(a)1 Visualize three-dimensional objects from different perspectives and analyze cross-sections, <i>surface area and volume</i>.</p>	<ol style="list-style-type: none"> 1. Identify parts of right prisms, pyramids, cylinders, cones and spheres. 2. Find lateral and total area of right prisms, pyramids, cylinders, cones and spheres to solve problems. 3. Find volume of right prisms, pyramids, cylinders, cones and spheres to solve problems. 4. Compare & contrast the volumes of solids with congruent bases and heights. 	<p>Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests</p> <p>Volume Experiment</p> <p><u>CAPT</u> <u>Simulation</u> Cement Column Post</p>	<p>Solids Manipulative</p> <p>Textbook: <i>Glencoe Geometry@2005</i></p> <p>Online resources: <i>Glencoe</i> worksheets used on the smart board.</p> <p>Geometer's Sketchpad</p> <p>CAPT released items</p>

	CT Frameworks/Standards	Content and Skill Objectives Students will be able to:	Assessments	Resources
<p>UNIT 6</p> <p>COORDINATE GEOMETRY & TRANSFORMATIONS</p> <p>2 WEEKS</p>	<p>CT(Core)3.2(a) Verify geometric relationships using algebra, coordinate geometry and <i>transformations</i>.</p> <p>CT(Core)3.2(a)3 Apply transformations to plane figures to determine congruence, similarity, symmetry and tessellations.</p> <p>CT(Extended) 3.2 Use spatial reasoning, location and geometric relationships to solve problems.</p> <p>CT(Extended) 3.2(a) Represent translations, reflections, rotations and dilations of plane figures using sketches, coordinates, vectors, function notation and matrices to examine the effects of transformations and their composites and to solve related geometric problems.</p>	<ol style="list-style-type: none"> 1. Recognize and name transformations as reflection, rotation, translation, dilation. 2. Recognize & draw lines and points of symmetry. 3. Find and draw images under given transformation. 4. Name the pre-image and image of a transformation and state the orientation. 5. Understand and explain properties preserved or changed in a given transformation. 	<p>Class Work Homework Teacher Made Worksheets Teacher Observation CAPT simulation Quizzes Unit Tests</p> <p>Tessellation Project</p>	<p>Textbook: <i>Glencoe Geometry@2005</i></p> <p>Online resources: <i>Glencoe</i> worksheets used on the smart board.</p> <p>Geometer's Sketchpad</p> <p>CAPT released items</p>