

GEOMETRY PACING GUIDE

Course Description: This course continues students' study of geometric concepts building upon middle school topics. Students will move from an inductive approach to deductive methods of proof in their study of two- and three-dimensional geometric figures. Reasoning skills will be emphasized and students will broaden their use of the coordinate plane. Appropriate technology, from manipulatives to calculators and graphics software, should be used regularly for instruction and assessment.

Days	Standard	Content	Guiding Questions	Topics (Glencoe Geometry)
1-7	<p>1.02 Use length, area, and volume of geometric figures to solve problems. Include arc length, area of sectors of circles; lateral area, surface area, and volume of three-dimensional figures; and perimeter, area, and volume of composite figures.</p> <p>1.03 Use length, area, and volume to model and solve problems involving probability.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p> <p>2.04 Develop and apply properties of solids to solve problems.</p>	<p>Basic undefined terms and definitions</p> <p>Measurement and problem solving</p> <p>Length and midpoint in one, two, and three dimension, plus linear probability</p> <p>Name, measure, define, classification, and problem solving for angles</p> <p>Identify, name, find area, perimeter, and problem solve for polygons</p>	<p>How does one determine which formulas or strategies are appropriate to use in solving a problem?</p> <p>What does one do when they don't know what to do to solve a problem?</p> <p>How are precision and accuracy in measurement determined/</p>	<ul style="list-style-type: none"> • Points, lines, planes • Linear measurement and precision • Distance and midpoint • Angle relationships • Polygons

Days	Standard	Content	Guiding Questions	Topics (Glencoe Geometry)
8-16	<p>2.01 Use logic and deductive reasoning to draw conclusions and solve problems.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p>	<p>Determine conclusions using inductive and deductive reasoning to include geometric figures</p> <p>Compound statements with truth tables for problem solving (optional)</p> <p>Problem solving with conditional statements</p> <p>Law of Detachment, Law of Syllogism with problem solving (optional)</p>	<p>How can you benefit from inductive reasoning techniques?</p> <p>How are basic underlying concepts arrived at in courses like Geometry or in the real world?</p> <p>How does geometry explain or describe the structure of our world?</p> <p>How do we develop mathematical conjectures?</p>	<ul style="list-style-type: none"> • Inductive reasoning and conjecture • Logic (optional) • Conditional statements • Deductive reasoning (optional) • Postulates & paragraph proofs • Algebraic proofs • Proving segment relationships • Proving angle relationships

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17-23	<p>2.01 Use logic and deductive reasoning to draw conclusions and solve problems.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p>	<p>Vocabulary, relationships, and modeling of parallel lines to include problem solving</p> <p>Problem solving with parallel lines and two column proofs</p> <p>Using slopes of lines to determine parallel and perpendicular</p> <p>Slope intercept and point slope forms of the equation of a line to include problem solving</p> <p>Two column proof and problem solving</p> <p>Problem solving and finding the distance between a point and a line or two lines (optional)</p>	<p>How does one construct a convincing argument?</p> <p>How do you know when you have a convincing argument?</p> <p>What are the relationships between pairs of angles formed when two parallel lines are cut by a transversal?</p> <p>How can deductive reasoning be used to establish or refute conjectures?</p> <p>What are the reasons that you could use to prove lines parallel in a formal proof?</p> <p>How do you know when a problem is solved?</p>	<ul style="list-style-type: none"> • Parallel lines • Angles and parallel lines • Slope of lines • Equations of parallel lines • Proving lines parallel • Perpendicular lines and distance

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24-30	<p>2.01 Use logic and deductive reasoning to draw conclusions and solve problems.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p> <p>2.03 Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs:</p> <p>a. Triangles b. Quadrilaterals c. Other polygons d. Circles</p> <p>3.01 Describe the transformation (translation, reflection, rotation, dilation) of polygons in the coordinate plane in simple</p>	<p>Classify and problem solving related to sides and angles of triangles</p> <p>Solve problems and prove triangle relationships</p> <p>Flow proofs and problem solving with pairs of triangles</p> <p>Flow and two column proofs, coordinate geometry application, and problem solving</p> <p>Problem solving and two column proofs with isosceles triangles</p> <p>Coordinate geometry as a method of proof</p> <p>Triangles used in the construction industry</p> <p>Methods used as the reasons to justify congruent triangles in a formal proof</p> <p>Differences and similarities of two-column proofs and flow proofs</p>	<p>Why are triangles used in the construction industry?</p> <p>What are the methods used as the reasons to justify congruent triangles in a formal proof?</p> <p>How are two-column proofs and flow proofs similar and different?</p> <p>How do you know when an estimate, approximation, or exact answer is appropriate?</p>	<ul style="list-style-type: none"> • Classify triangles • Angles of triangles • Congruent triangles • Proving triangle congruency SSS, SAS • Proving triangle congruency ASA, AAS, HL • Isosceles triangles • Triangle and coordinate proof (optional)

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31-37	<p>1.03 Use length, area, and volume to model and solve problems involving probability.</p> <p>2.01 Use logic and deductive reasoning to draw conclusions and solve problems.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p> <p>2.03 Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs:</p> <ol style="list-style-type: none"> Triangles Quadrilateral Other polygons Circles 	<p>Identify, model, and problem solving of bisectors, altitudes, and medians.</p> <p>Review Algebra I inequality properties and use one triangle inequality properties to solve problems and write proofs.</p> <p>Apply indirect reasoning to do algebraic and geometric proofs.</p> <p>Apply the triangle inequality theorem in problem solving and doing proofs.</p> <p>Apply the two-triangle inequality theorem in problem solving and doing proofs.</p>	<p>How do you describe the position of an angle bisector, perpendicular bisector, median, and altitudes from the vertex of a triangle?</p> <p>What is the first step following the given in an indirect proof?</p> <p>What is the relationship between the sum of the lengths of any two sides of a triangle and the third side?</p>	<ul style="list-style-type: none"> Bisectors, medians, altitudes Inequalities and triangles Indirect proofs The triangle inequality theorem Inequalities involving two triangles

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38-44	<p>1.02 Use length, area, and volume of geometric figures to solve problems. Include are length, area of sectors of circles; lateral area, surface area, and volume of three-dimensional figures; and perimeter, area, and volume of composite figures.</p> <p>2.01 Use logic and deductive reasoning to draw conclusions and solve problems.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p> <p>2.03 Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs:</p> <ol style="list-style-type: none"> Triangles Quadrilaterals Other polygons Circles 	<p>Basic review covered in 7th & 8th grade, and Algebra 1 to include problem solving</p> <p>Identify, solve problems, and do proofs with proportions relating to similar polygons</p> <p>Use divided proportional as it relates to triangles and the mid-segment theorem to solve problems and write proofs</p> <p>Recognize and use relationships relative to perimeters of triangles and proportional relationships for angle bisectors, altitudes, and medians of similar triangles to solve problems and write proofs</p> <p>Extension for similar triangles but cover similarity as an iteration (optional)</p>	<p>How does an architect use geometry?</p> <p>How do you use similarity to solve problems involving lengths of segments involving similar triangles?</p>	<ul style="list-style-type: none"> • Proportions • Similar polygons • Similar triangles • Parallel and proportional parts • Parts of similar triangles • Fractals and self-similarity (optional)

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45-49	<p>1.01 Use trigonometric ratios to model and solve problems involving right triangles.</p> <p>2.01 Use logic and deductive reasoning to draw conclusions and solve problems.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p> <p>2.03 Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs:</p> <ol style="list-style-type: none"> Triangles Quadrilaterals Other polygons Circles 	<p>Solve problems and write proofs relating to right triangles and the altitude to the hypotenuse.</p> <p>Use the Pythagorean theorem and its converse in problem solving.</p> <p>Use properties of 30-60-90 and 45-45-90 degree triangles in problem solving.</p> <p>Determine trigonometric ratios for sine, cosine, and tangent and use them in problem solving.</p> <p>Solving problem involving angles of elevation and angles of depression.</p> <p>Solve problems using the Law of Sines and Cosines. (optional)</p> <p>Know the unit circle as it relates to degrees and radians and use the unit circle in problem solving. (honors geometry)</p>	<p>How would the Egyptians use the Pythagorean theorem in building pyramids?</p> <p>What are the relationships between the segment lengths in a 30-60-90 triangle and the 45-45-90?</p>	<ul style="list-style-type: none"> • Geometric mean • The Pythagorean theorem • Special right triangles • Trigonometry • Angles of elevation and depression • The Law of Sines (optional) • The Law of Cosines (optional) • The unit circle (honors only)

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50-57	<p>2.01 Use logic and deductive reasoning to draw conclusions and solve problems.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p> <p>2.03 Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs:</p> <p>a. Triangles</p> <p>b. Quadrilaterals</p> <p>c. Other polygons</p> <p>d. Circles</p>	<p>Investigate and solve problems relating to polygons.</p> <p>Write proofs and solve problems using the definition and properties of parallelograms.</p> <p>Solve problems and justify reasons for a quadrilateral being a parallelogram.</p> <p>Solve problems and write proofs relating to rectangles, rhombi, squares, kites, and trapezoids.</p> <p>Positioning of the quadrilateral family in a coordinate plane for proof (optional)</p>	<p>What are the differences and similarities between the properties of rectangles, parallelograms, squares, trapezoids, rhombi, and kites?</p> <p>How do you find the sum of the measures of the angles of a polygon for a home plate in baseball?</p> <p>What are four ways to prove that a quadrilateral is a parallelogram given the coordinates of the vertices?</p>	<ul style="list-style-type: none"> • Angles of polygons • Parallelogram • Test for parallelograms • Rectangles • Rhombi, squares and kites • Trapezoids • Coordinate proofs and quadrilaterals (optional)

Days	Standard	Content	Guiding Questions	Topics (Glencoe Geometry)
58-64	<p>1.02 Use length, area, and volume of geometric figures to solve problems. Include are length, area of sectors of circles; lateral area, surface area, and volume of three dimensional figures; and perimeter, area, and volume of composite figures.</p> <p>1.03 Use length, area, and volume to model and solve problems involving probability</p> <p>2.01 Use logic and deductive reasoning to draw conclusions and solve problems.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p> <p>2.03 Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs:</p> <ol style="list-style-type: none"> Triangles Quadrilaterals Other polygons Circles 	<p>Identify and use parts of circles in problem solving to include circumference.</p> <p>Recognize parts of circles and solve problems relating to theorems and write proofs.</p> <p>Solve problems and write proofs related to arcs, chords, and inscribed angles of circles.</p> <p>Solve problems using tangents to circles and inscribed polygons.</p> <p>Solve problems relating to angles formed by lines intersecting inside or outside a circle.</p> <p>Solve problems involving segments that intersect in the interior or exterior of a circle.</p> <p>Graph and solve problems relating to the standard form of the equation of a circle.</p>	<p>How can you find the measures of angles in a circle formed by radii, diameters, chords, tangents, and secants?</p> <p>How are tangents related to track and field events?</p>	<ul style="list-style-type: none"> • Circles and circumferences • Angles and arcs • Arcs and chords • Inscribed angles • Tangents • Secants, tangents and angle measure • Special segments in a circle • Equations of circles

Days	Standard	Content	Guiding Questions	Topics (Glencoe Geometry)
65-69	<p>1.01 Use the trigonometric ratios to model and solve problems involving right triangles.</p> <p>1.02 Use length, area, and volume of geometric figures to solve problems. Include are length, area of sectors of circles; lateral area, surface area, and volume of three-dimensional figures; and perimeter, area, and volume of composite figures.</p> <p>2.01 Use logic and deductive reasoning to draw conclusions and solve problems.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p> <p>2.03 Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs:</p> <ol style="list-style-type: none"> Triangles Quadrilaterals Other polygons Circles <p>3.01 Describe the transformation (translation, reflection, rotation, dilation) of polygons in the coordinate plane in simple algebraic terms.</p>	<p>Use formulas to solve problems relating to the perimeter and area of a parallelogram, trapezoids, rhombi, and kites.</p> <p>Use formulas to solve problems relating to perimeter, circumference, and area of regular polygons and circles.</p> <p>Use formulas to solve problems relating to the perimeter and area of irregular figures to include figures in a coordinate plane.</p> <p>Solving problems using geometric probability and sectors and segments of a circle.</p>	<p>What are the impacts of using estimation or exact measurements? How would you determine the amount of paint needed to paint three rooms in a home that will take two coats for a finished job?</p> <p>What would you do to determine the probability of landing in the region outside an equilateral triangle of which is inside a trapezoid?</p>	<ul style="list-style-type: none"> • Areas of parallelogram • Areas of trapezoids, rhombi and kites • Areas of regular polygons • Areas of irregular figures • Geometric probability

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70-78	<p>1.01 Use the trigonometric ratios to model and solve problems involving right triangles.</p> <p>1.02 Use length, area, and volume of geometric figures to solve problems. Include are length, area of sectors of circles; lateral area, surface area, and volume of three-dimensional figures; and perimeter, area, and volume of composite figures.</p> <p>1.03 Use length, area, and volume to model and solve problems involving probability.</p> <p>2.01 Use logic and deductive reasoning to draw conclusions and solve problems.</p> <p>2.02 Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.</p> <p>2.03 Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs:</p> <ol style="list-style-type: none"> Triangles Quadrilaterals Other polygons Circles <p>2.04 Develop and apply properties of solids to solve problems.</p>	<p>Orthogonal drawings of three dimensional figures (optional)</p> <p>Solve problems of three dimensional figures using two dimensional models</p> <p>Solving problems involving the lateral and surface area of prisms, cylinders, pyramids, and cones</p> <p>Solving problems involving the surface area of spheres</p> <p>Solve problems involving prisms, cylinders, pyramids, cones, and spheres</p> <p>Identify congruent and similar solids and solve problems involving length, area, and volume of similar solids</p> <p>Solve problems involving midpoints and lengths of three dimensional figures</p>	<p>How do you determine the surface area of a square pyramid?</p> <p>What is the relationship between the volume of a cylinder and cone?</p> <p>What is the relationship between the areas of the base and the volumes of the solids, if the ratio of two linear dimensions is a:b?</p>	<ul style="list-style-type: none"> • Three dimensional figures • Nets and surface areas • Surface areas of prisms • Surface areas of cylinders • Surface areas of pyramids • Surface areas of cones • Surface areas of spheres • Volume of prisms and cylinders • Volume of pyramids and cones • Volume of spheres • Congruent and similar solids • Coordinates in space

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79-81	<p>3.01 Describe the transformation (translation, reflection, rotation, dilation) of polygons in the coordinate plane in simple algebraic terms.</p> <p>3.02 Use the matrix operations (addition, subtraction, multiplication, scalar multiplication) to describe the transformation of polygons in the coordinate plane.</p>	<p>Recognize, draw, and problem solve using reflections, including lines and points of symmetry with respect to the x and y axis, $y=x$, and the origin</p> <p>Recognize, draw, and problem solve using translations to include repeated reflections and compositions and describe algebraically</p> <p>Recognize, draw, and problem solve using rotations and identify types of rotational symmetry</p> <p>Recognize as repeated reflections, translations, and rotations (optional)</p> <p>Problem solve and recognize dilations as similar figures and associated scale factor</p> <p>Find magnitude and direction of vector and perform translations and vectors (optional)</p> <p>Use matrices to determine coordinates of reflections and rotations and problem solve using matrix addition, subtraction, and multiplication</p>	<p>What 2x2 matrix would you use to rotate a quadrilateral 270 clockwise about the origin in a coordinate plane?</p> <p>How do you use dilations when you use a computer?</p>	<ul style="list-style-type: none"> • Reflections • Translations • Rotations • Tessellations (optional) • Dilations • Vectors (optional) • Transformations with matrices
82-90	Comprehensive Exam Review & Exam			