OVERVIEW:

1. Points, Lines, and Planes
2. Deductive Reasoning
3. Parallel Lines and Planes
4. Congruent Triangles
5. Quadrilaterals
6. Similar Polygons
7. Right Triangles
8. Circles
9. Areas of Plane Figures
10. Areas and Volumes of Solids
11. Coordinate Geometry

OUTLINE:

Notes: Each class is 50 minutes and meets 4 times per week. Time frames are approximate and include assessments. Asterisks (*) indicate optional topics.

Quarter 1:

UNIT 1: POINTS, LINES, AND PLANES

Approx. 10 days

1. Use the term equidistant.
2. Use the undefined terms points, line, and plane.
3. Draw representations of points, lines, and planes.
4. Use the terms collinear, coplanar, and intersection.
5. Use symbols for lines, segments, rays, and distances; find distances.
6. Name angles and find their measures.
7. State and use the Segment Addition Postulate and the Angle Addition Postulate.
8. Recognize what you can conclude from a diagram.
9. Use postulates and theorems relating points, lines, and planes.
10. Algebra Review: Linear Equations
UNIT 2: DEDUCTIVE REASONING  
Approx. 12 days

1. Recognize the hypothesis and the conclusion of an if-then statement.
2. State the converse of an if-then statement.
3. Use a counterexample to disprove an if-then statement.
4. Understand the meaning of if and only if.
5. Use properties from algebra and properties of congruence in proofs.
6. Use the Midpoint Theorem and the Angle Bisector Theorem.
7. Know the kinds of reasons that can be used in proofs.
8. Apply the definitions of complementary and supplementary angles.
9. State and use the theorem about vertical angles.
10. Apply the definition and theorems about perpendicular lines.
11. State and apply the theorems about angles supplementary to, or complementary to, congruent angles.
12. Plan proofs and then write them in two-column form.

Quarter 2:

UNIT 3: PARALLEL LINES AND PLANES  
Approx. 11 days

1. Distinguish between intersecting lines, parallel lines, and skew lines.
2. State and apply the theorem about the intersection of two parallel planes by a third plane.
3. Identify the angles formed when two lines are cut by a transversal.
4. State and apply a postulate and theorems about parallel lines.
5. State and apply the postulates and theorems about parallel lines.
6. State and apply the theorems about a parallel and a perpendicular to a given line through a point outside the line.
7. Classify triangles according to sides and to angles.
8. State and apply the theorem and the corollaries about the sum of the measures of the angles of a triangle.
9. State and apply the theorem about the measure of an exterior angle of a triangle.
10. Recognize and name convex polygons and regular polygons.
11. Find the measures of interior angles and exterior angles of convex polygons.
12. Understand and use inductive reasoning.
13. Algebra Review: The coordinate plane

Geometry
2011-2012 Curriculum Outline
Packer Collegiate Institute
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Page 2 of 6
UNIT 4: CONGRUENT TRIANGLES

1. Identify corresponding parts of congruent figures.
2. Prove two triangles congruent by using the SSS, the SAS, and the ASA Postulates.
3. Deduce information about segments and angles after proving that two triangles are congruent.
4. Apply the theorems and corollaries about isosceles triangles.
5. Use the AAS Theorem to prove two triangles congruent.
6. Use the HL Theorem to prove two right triangles congruent.
7. Prove that two overlapping triangles are congruent.
8. Prove two triangles are congruent by first proving two other triangles congruent.
9. Apply the definitions of the median and the altitude of a triangle and the perpendicular bisector of a segment.
10. State and apply the theorem about a point on the perpendicular bisector of a segment, and the converse.
11. State and apply the theorem about a point on the bisector of an angle, and the converse.

UNIT 5: QUADRILATERALS

1. Apply the definition of a parallelogram and the theorems about properties of a parallelogram.
2. Prove that certain quadrilaterals are parallelograms.
3. Apply theorems about parallel lines.
4. Apply the midpoint theorems for triangles.
5. Apply the definitions and identify the special properties of a rectangle, a rhombus, and a square.
6. Determine when a parallelogram is a rectangle, rhombus, or square.
7. Apply the definitions and identify the properties of a trapezoid and an isosceles trapezoid.
8. Algebra Review: Absolute value sentences
Quarter 3:

UNIT 6: SIMILAR POLYGONS

1. Express a ratio in simplest form.
2. Solve for an unknown term in a given proportion.
3. Express a given proportion in an equivalent form.
4. State and apply the properties of similar polygons.
5. Use the AA Similarity Postulate to prove triangles similar.
6. Use similar triangles to deduce information about segments or angles.
7. Use the SAS Similarity Theorem and the SSS Similarity Theorem to prove triangles similar.
8. Apply the Triangle Proportionality Theorem and its corollary.
9. State and apply the Triangle Angle-Bisector Theorem.
10. Algebra Review: Rational Expressions

UNIT 7: RIGHT TRIANGLES

1. Determine the geometric mean between two numbers.
2. State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle.
3. State and apply the Pythagorean Theorem.
4. State and apply the converse of the Pythagorean Theorem and related theorems about obtuse and acute angles.
5. Determine the lengths of two sides of a 45-45-90 or a 30-60-90 triangle when the length of the third side is known.
6. Define the tangent ratio for an acute angle.
7. Solve right triangle problems using the tangent ratio.
8. Define the sine and cosine ratios for an acute angle.
9. Solve right triangle problems by using the sine and cosine ratios.
10. Solve right triangle problems by correct selection and use of the tangent, sine, and cosine ratios.
11. Algebra Review: Radicals
UNIT 8: CIRCLES

Approx. 12 days

1. Define a circle, a sphere, and terms related to them.
2. Recognize inscribed polygons and circumscribed circles.
3. Apply theorems that relate tangents and radii.
4. Recognize circumscribed polygons and inscribed circles.
5. Define and apply properties of arcs and central angles.
6. Apply theorems about the chords of a circle.
7. Solve problems and prove statements involving inscribed angles.
8. Solve problems and prove statements involving angles formed by chords, secants, and tangents.
9. Solve problems involving lengths and chords, secant segments, and tangent segments.
10. Algebra Review: Evaluating Formulas

Quarter 4:

UNIT 9: AREAS OF PLANE FIGURES

Approx. 10 days

1. Understand what is meant by the area of a polygon.
2. Understand the area postulates.
3. Know and use the formula for the area of a rectangle.
4. Know and use the formulas for the areas of parallelogram, triangles, and rhombuses.
5. Know and use the formula for the area of a trapezoid.
6. Know and use the formula for the areas of regular polygons.
7. Know and use the formulas for the circumferences and areas of circles that are derived from the perimeter and area formulas for regular polygons.
8. Know and use the formulas for arc length and the areas of sectors of a circle.
9. Find the ratio of the areas of two triangles.
10. Understand and apply the relationships between scale factors, perimeters, and areas of similar figures.
11. Algebra Review: Laws of exponents
UNIT 10: AREA AND VOLUMES OF SOLIDS

1. Identify the parts of prisms.
2. Find the lateral areas, total areas, and volumes of right prisms.
3. Identify the parts of pyramids.
4. Find the lateral areas, total areas, and volumes of regular polygons.
5. Find the lateral areas, total areas, and volumes of right cylinders and right cones.
6. Find the area and the volume of a sphere.
7. State and apply the properties of similar solids.
8. Algebra Review: Story Problems

UNIT 11: COORDINATE GEOMETRY

1. Understand the derivation and apply the distance formula.
2. Find the slope of a line from a graph and an equation.
3. Identify parallel and perpendicular lines and understand the relationship between their slopes.
4. Understand and apply the midpoint formula.
5. Identify the equation of a line.
6. Graphing a line given the equation.
7. Identify the equation of a circle.