**Subject Area:** MATHEMATICS  

**Component XV:** GEOMETRY  

**Indiana Academic Standard 3: Geometry and Measurement**
Students learn about geometric shapes and develop a sense of space. They identify, describe, compare, sort, and draw them, and explain their reasoning by using specific geometric terms. As the student progresses, he/she develops an understanding of symmetry and three-dimensional objects and space.

**GOALS: The student will be able to...**

<table>
<thead>
<tr>
<th>A. Identify/Describe/Make cubes, spheres, cones, cylinders, pyramids and rectangular solids and sort them using their faces, edges, and quadrilateral corners.</th>
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<tbody>
<tr>
<td>B. Identify/Illustrate/Describe circles, rectangles, squares, triangles, trapezoids, parallelograms and rhombi</td>
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<tr>
<td>C. Recognize geometric shapes in the world around them</td>
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<tr>
<td>D. Identify/Draw points, lines, line segments, rays, parallel lines and perpendicular lines</td>
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<td>E. Identify/Demonstrate pairs of figures that are congruent</td>
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<tr>
<td>F. Develop, Compare, and Draw lines of symmetry for given shapes</td>
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<tr>
<td>G. Identify/Describe/Draw right, acute, obtuse, and straight angles</td>
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<td>H. Classify both plane and solid geometric figures identifying their properties</td>
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<td>I. Apply relationships using the Pythagorean theorem to problem-solving situations</td>
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<td>J. Perform constructions with compass and straightedge.</td>
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<td>K. Identify and draw a wide range of transformations of shapes</td>
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**LEGEND:** I= the grade at which the skill is introduced  
Grey-shaded area= grades at which the skill is to be developed and expanded.  
State standards are assessed annually, beginning the year after introduction.

<table>
<thead>
<tr>
<th>The student will be able to...</th>
<th>The teacher will...</th>
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<tbody>
<tr>
<td><strong>SKILLS/CONCEPTS</strong></td>
<td><strong>K</strong></td>
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<tr>
<td>A Identify Geometric Figures</td>
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<tr>
<td>A1 Identify and describe common geometric objects: circle, square, rectangle, and triangle. (K1.3)</td>
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<tr>
<td>A2 Identify, describe, compare, sort, and draw triangles, rectangles, squares, and circles. (1.3.1)</td>
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### SKILLS/CONCEPTS

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<tr>
<th>A3 Identify triangles, rectangles, squares, and circles as the faces of three-dimensional object.</th>
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<td>A4 Recognize geometric shapes and their properties in the environment and specify their locations. (2.3.1)</td>
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<td>A5 Identify quadrilaterals as four-sided shapes.</td>
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<td>A6 Identify, describe, and classify: cube; sphere; prism; pyramid; cone; cylinder.</td>
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<td>A7 Identify, describe, draw, and classify triangles as equilateral, isosceles, scalene, right, acute, obtuse, and equiangular.</td>
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<td>A8 Identify and describe basic properties of geometric shapes: altitudes, diagonals; angle and perpendicular bisectors; central angles; radii; diameters; and chords. (8.3.1)</td>
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<td>A9 Identify properties of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more figures intersect in a place or in space. (8.3.2)</td>
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#### B Illustrate Geometric Figures

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<tr>
<th>B1 Compare and sort common objects by position, shape, size, roundness, and number of corners. (K.3.1)</th>
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<tr>
<td>B2 Identify, describe, compare, sort, and draw triangles, rectangles, squares, and circles. (1.3.1)</td>
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<td>B3 Visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids.</td>
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<td>B4 Recognize, describe, or extend geometric patterns using tables, graphs, words, or symbols. (7.3.4)</td>
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#### C Recognize Real World Geometric Figures

| C1 Identify geometric shapes and structures in the environment and specify their location. | I |

#### D Identify Points, Lines
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<th>SKILLS/CONCEPTS</th>
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<td>D1 Use terms; points, lines, and line segments in describing two dimensional shapes. (3.3.2)</td>
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<td>D2 Draw points, line segments and lines. (3.3.2)</td>
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<td>D3 Use the terms point, line, and line segment in describing two-dimensional shapes.</td>
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<td>D4 Measure and draw line segments to nearest 1/8 inch &amp; millimeter. (4.3.4)</td>
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<td>D5 Identify/Describe/Draw parallel, perpendicular, and non-perpendicular lines using appropriate mathematical tools and technology. (4.3.1)</td>
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<td><strong>E Demonstrate Congruent Figures</strong></td>
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<td>E2 Identify congruent two-dimensional shapes in any position.</td>
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<td>E3 Draw a shape that is congruent to another shape.</td>
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<td>F1 Draw and identify lines of symmetry.</td>
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<td>F2 Identify, when given a set of plane figures and their attributes, those that are congruent.</td>
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<td>F3 Identify, when given a set of plane figures and their attributes, those that are similar. (2.3.1)</td>
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<td>F4 Apply, when given a problem-solving situation involving similar geometric figures, the properties of similarity to solve the problem.</td>
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<td>F5 Identify and draw lines of symmetry in geometric shapes (by hand or using technology and shapes in the environment). (3.3.3)</td>
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<td>F6 Sketch the mirror image reflections of shapes.</td>
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<td>F7 Identify and draw lines of symmetry in polygons.</td>
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# SKILLS/CONCEPTS

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<td><strong>G Plane and Solid Figures</strong></td>
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<td>G1 Identify right angles in shapes and objects and decide whether other angles are greater or less than a right angle. (3.3.1, 4.3.2)</td>
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<td>G2 Identify/Describe/Draw rays, rights, acute, obtuse, and straight angles using appropriate tools and technology. (4.3.2)</td>
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<td>G3 Identify, draw, and use the properties of vertical, adjacent, complementary, and supplementary angles and properties of triangles and quadrilaterals to solve problems involving a missing angle. (6.3.1)</td>
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<td>G4 Use the properties of complementary, supplementary, and vertical angles to solve problems involving an unknown angle. Justify solutions.</td>
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<td>G5 Measure and describe angles in degrees (5.3.1)</td>
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<td><strong>H Classify Plane and Solid Figures</strong></td>
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<td>H1 Identify and/or classify a selection of plane figures.</td>
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<td>H2 Identify the properties of a plane or solid figure.</td>
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<td>H3 Classify and sort familiar plane and solid objects by position, shape, size, roundness, and other attributes. Explain the rule you used.</td>
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<td>H4 Identify objects as two- or three dimensional.</td>
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<td>H5 Describe the attributes (such as number of edges, vertices, and number of faces) of solids, including cubes, pyramids, and cylinders. (5.3.3)</td>
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**I Use Pythagorean Theorem**

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<td>I1 Know and understand the Pythagorean</td>
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<td>J4 Draw quadrilaterals and triangles</td>
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<td>K Identify Transformations of Shapes</td>
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<td>K1 Draw the translation (slide) and</td>
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<td>K2 Understand coordinate graphs and</td>
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<td>use them to plot simple shapes, find</td>
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<td>lengths and areas related to shapes</td>
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<td>(slides), rotation (turns), and</td>
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<td>reflections (flips). (7.3.2)</td>
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### SKILLS/CONCEPTS

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<tbody>
<tr>
<td>K3 Understand that transformations such as slides, turns, and flips preserve the length of segments, and that figures resulting from slides, turns, and flips are congruent to the original figures. (7.3.1)</td>
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<td>K4 Draw the translation (slide), rotation (turn), reflection (flip), and dilation (stretches and shrinks) of shapes. (7.3.2)</td>
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<td>K5 Identify and describe using words and pictures, transformations such as reflections, rotations, and translations, and use this knowledge to design, analyze simple tilings and tessellations. (5.3.4)</td>
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Component XVI: SPATIAL SENSE

Indiana Academic Standard 3: Geometry and Measurement

Students learn about geometric shapes and develop a sense of space. They identify, describe, compare, sort, and draw them, and explain their reasoning by using specific geometric terms. As the student progresses, he/she develops an understanding of symmetry and three-dimensional objects and space.

GOALS: The student will be able to...

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<tbody>
<tr>
<td>A  Learn/Use Positional Terms</td>
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<td>A1 Identify and use the terms; inside, outside, between, above, and below. (K.3.2)</td>
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<td>A2 Arrange and describe objects in space by position and direction: near, far, under, over, up, down, behind, in front of, next to, to the left or right of.</td>
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<td>A3 Identify and draw the radius and diameter of a circle and understand the relationship between the radius and diameter.</td>
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<td>A4 Understand that the sum of the interior angles of any triangle is 180° and that the sum of the interior angles of any quadrilateral is 360°. Use this information to solve problems. (6.3.2)</td>
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<td>B  Create Shapes</td>
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LEGEND: I= the grade at which the skill is introduced
Grey-shaded area= grades at which the skill is to be developed and expanded.
State standards are assessed annually, beginning the year after introduction.
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<td>B1 Copy a shape when given a simple pattern.</td>
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<td>B2 Differentiate/Make shapes which can be created from a set of two shapes.</td>
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<td>B3 Differentiate/Make shapes that can be created from a set of three or more simple shapes.</td>
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<td>B4 Differentiate/Make shapes that can be created from a set of four or more simple shapes.</td>
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<td>C Draw/Compare Shapes In Various Positions</td>
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<td>C1 Identify simple congruent figures in different positions.</td>
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<td>C2 Sketch a shape that is upside down, or on its side.</td>
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<td>C3 Identify congruent figures in the same/different perspectives.</td>
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<td>C4 Draw figures congruent to a given figure.</td>
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<td>C5 Draw a shape, congruent to the shape that has been turned on its side or upside down.</td>
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<td>C6 Describe, classify, and sort plane and solid geometric shapes (triangle, square, rectangle, cube, rectangular prism) according to the number and shape of faces, and the number of edges and vertices.</td>
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<td>C7 Identify congruent quadrilaterals and give reasons for congruence using sides, angles, parallels and perpendiculars.</td>
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<td>C8 Identify congruent triangles and justify your decisions by referring to sides and angles.</td>
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<td>C9 Identify, describe, draw, and classify polygons, such as pentagons and hexagons.</td>
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<td>C10 Understand that 90°, 180°, 270°, and 360° are associated with quarter, half, three-quarters, and full turns, respectively.</td>
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<td>C11 Identify and draw two-dimensional shapes that are similar.</td>
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<td>D Predict Results</td>
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<td>D1 Separate a shape into smaller shapes.</td>
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<td>D2 Investigate and predict the result of putting together and taking apart two- and three-dimensional shapes.</td>
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<td><strong>E Construct Dimensional Objects</strong></td>
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<td>E1 Construct squares, rectangles, cubes, and rectangular prisms with appropriate materials.</td>
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<td>E2 Identify, describe, and draw parallelograms, rhombuses, and trapezoids, using appropriate mathematical tools and technology.</td>
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<td>E3 Construct prisms and pyramids using appropriate materials.</td>
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<td>E4 Given a picture of a three-dimensional object, build the object with blocks.</td>
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<td><strong>F Draw From Different Perspectives</strong></td>
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<td>F1 Select a three-dimensional object when given illustrations from two different perspectives.</td>
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<td>F2 Identify shapes that have reflectional and rotational symmetry. (4.3.3)</td>
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