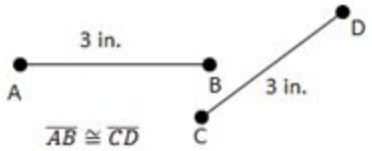
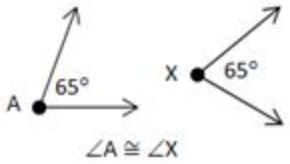
Richmond Public Schools

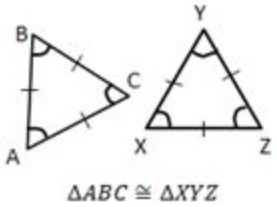
Curriculum Framework

Grade 6

Strand: Measurement and Geometry	
6.9 The student will determine congruence of segments, angles, and polygons.  On the state assessment, items measuring this objective are assessed WITH the use of a calculator. Grades 6 mathematics assessments will include a Desmos scientific calculator on the section of the test in which a calculator is allowed.	
Suggested Pacing	
Third Nine Weeks-3 instructional days	
Related Standards	
3.11 The student will identify and draw representations of points, lines, line segments, rays, and angles **4.10** The student will a) identify and describe points, lines, line segments, rays, and angles, including endpoints and vertices; **5. 12** The student will classify and measure right, acute, obtuse, and straight angles.	**7.5** The student will solve problems, including practical problems, involving the relationship between corresponding sides and corresponding angles of similar quadrilaterals and triangles. **8.5** The student will use the relationships among pairs of angles that are vertical angles, adjacent angles, supplementary angles, and complementary angles to determine the measure of unknown angles. **G.4** The student will construct and justify the constructions of a) a line segment congruent to a given line segment; f) an angle congruent to a given angle. **G.6** The student, given information in the form of a figure or statement, will prove two triangles are congruent. **G.7** The student, given information in the form of a figure or statement, will prove two triangles are similar.
Essential Questions	**Common Misconceptions**
● How does the line create 2 congruent parts when certain shapes are divided with a line of symmetry? ● How do you determine if two figures are congruent?	● A star is not considered to be regular polygon because all of the interior angles are not congruent. ○ There are 10 sides and 10 angles, but not all angles are congruent. Teachers should show the angles to students and show how a square has four equal sides and four

<table>
<tr><td></td><td>equal angles.
● Students are not familiar with the marks used to show corresponding congruent sides and angles.
● Students have difficulty reading and writing congruency statements.</td></tr>
<tr><th>Understanding the Standard</th><th>Essential Knowledge and Skills</th></tr>
<tr><td>● The symbol for congruency is ≅.
● Congruent figures have exactly the same size and the same shape. Line segments are congruent if they have the same length. Angles are congruent if they have the same measure. Congruent polygons have an equal number of sides, and all the corresponding sides and angles are congruent.
○ Examples:
 

 
</td><td>The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to
● Identify regular polygons.
● Draw lines of symmetry to divide regular polygons into two congruent parts.
● Determine the congruence of segments, angles, and polygons given their properties.
● Determine whether polygons are congruent or noncongruent according to the measures of their sides and angles.</td></tr>
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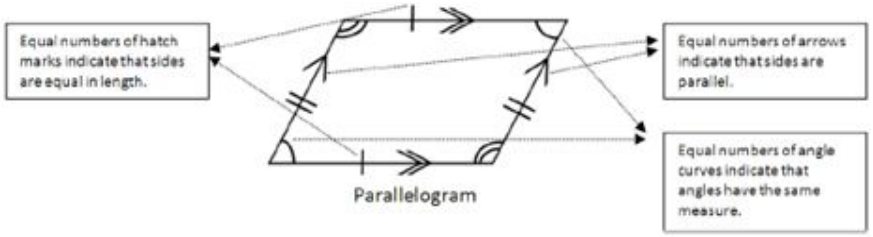
- A polygon is a closed plane figure composed of at least three line segments that do not cross.
- A regular polygon has congruent sides and congruent interior angles.
- The number of lines of symmetry of a regular polygon is equal to the number of sides of the polygon.
- A line of symmetry divides a figure into two congruent parts, each of which is the mirror image of the other. Lines of symmetry are not limited to horizontal and vertical lines.
- Noncongruent figures may have the same shape but not the same size.
- Students should be familiar with geometric markings in figures to indicate congruence of sides and angles and to indicate parallel sides. An equal number of hatch (hash) marks indicate that those sides are equal in length. An equal number of arrows indicate that those sides are parallel. An equal number of angle curves indicate that those angles have the same measure. See the diagram below.



- The determination of the congruence or noncongruence of two figures can be accomplished by placing one figure on top of the other or by comparing the measurements of all corresponding sides and angles.
- Construction of congruent line segments, angles, and polygons helps students understand congruency

Vocabulary	**Instructional Activities Organized by Learning Objective**

congruent segments angles regular polygon symmetry sides line of symmetry noncongruent figure corresponding angles parallel	Textbook Virginia Math Connects, Course 1, ©2012, Glencoe/McGraw-Hill page(s) 429 – 433 and 462 -473 Extra Practice page –EP20 -23 Lessons 8-1, 8-2, and 8-3 Coach book, 6th Grade Virginia Gold Edition page(s) 162 – 168 Notes
Assessment	Resources ● Print SOL 6.9 Interactive Notebook (INB) notes ● Technology-based Similarity and Congruence [SMART Notebook lesson] - - interactive skill practice Congruent and Symmetric Polygons [SMART Notebook lesson] - interactive skill practice Polygons [SMART Notebook lesson] - - interactive skill practice Brain Pop – Polygons – interactive skill practice Station Activities
Cross-Curricular Connections	**Tiered Differentiation**
Reading – The Greedy Triangle by Marilyn Burns Art - Klee: Polygon Detective Inspired by Paul Klee's Castle and Sun Show students an image of the painting Castle and Sun. Have them point out different polygons that they see within the painting. Afterwards, give	Polygon Sort- sort pictures of polygons by their attributes Locate corresponding sides and angles of various shapes. Find shapes in magazines, pictures, etc. Use quadrilateral shapes and protractors to find the sum of the measures of the angles.

children construction paper and have them make their own castle. First, they lay out the outline of their castle by drawing rectangles. Next, they draw lines, using a ruler, within their rectangles to create polygons within the rectangular outlines. Then, they look for and color in polygons that have the same number of side	Geoboards – Make congruent and non-congruent polygons and explain why they are or are not congruent.