

Richmond Public Schools
Curriculum Framework
Grade 8

Strand: Measurement and Geometry	
<p>8.7 The student will</p> <p>a) given a polygon, apply transformations, to include translations, reflections, and dilations, in the coordinate plane; and</p> <p>b) identify practical applications of transformations.</p>	
Suggested Pacing	
Third Nine Weeks – 8 Instructional Days (including common assessment)	
Related Standards	
<p>Spiral Down</p> <p>7.7 The student will apply translations and reflections of right triangles or rectangles in the coordinate plane.</p> <p>6.8 The student will</p> <p>a) identify the components of a coordinate plane; and</p> <p>b) identify the coordinates of a point and graph ordered pairs in a coordinate plane.</p>	<p>Spiral Up</p> <p>G.3 The student will solve problems involving symmetry and transformation. This will include</p> <p>d) determining whether a figure has been translated, reflected, rotated, or dilated, using coordinate methods.</p>
Essential Questions	Common Misconceptions
<p>How does the transformations of a figure on the coordinate grid affect the congruency, location and symmetry of an image?</p> <p><i>Translations and reflections maintain congruence between the preimage and image, but change location. Dilation by a scale factor other than 1 will produce an image that is not congruent to the preimage, but is similar.</i></p>	<ul style="list-style-type: none"> ● Students need to be reminded of the difference between preimage and image. ● Students need to be reminded of the characteristics for each transformation. ● Students may have difficulty correctly reading or writing ordered pairs after the transformation.
Understanding the Standard	Essential Knowledge and Skills

Richmond Public Schools

Curriculum Framework

Grade 8

- Translations and reflections maintain congruence between the preimage and image but change location. Dilations by a scale factor other than 1 produce an image that is not congruent to the preimage but is similar. Reflections change the orientation of the image.
- A transformation of a figure, called preimage, changes the size, shape, and/or position of the figure to a new figure, called the image.
- A transformation of preimage point A can be denoted as the image A' (read as “ A prime”).
- A reflection is a transformation in which an image is formed by reflecting the preimage over a line called the line of reflection. Each point on the image is the same distance from the line of reflection as the corresponding point in the preimage.
- A translation is a transformation in which an image is formed by moving every point on the preimage the same distance in the same direction.
- A dilation is a transformation in which an image is formed by enlarging or reducing the preimage proportionally by a scale factor from the center of dilation (limited to the origin in grade eight).
A dilation of a figure and the original figure are similar. The center of dilation may or may not be on the preimage.
- The result of first translating and then reflecting over the x - or y -axis may not result in the same transformation of reflecting over the x - or y -axis and then translating.
- Practical applications may include, but are not limited to, the following:

The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to

- Given a preimage in the coordinate plane, identify the coordinate of the image of a polygon that has been translated vertically, horizontally, or a combination of both. (a)
- Given a preimage in the coordinate plane, identify the coordinates of the image of a polygon that has been reflected over the x - or y -axis. (a)
- Given a preimage in the coordinate plane, identify the coordinates of the image of a right triangle or a rectangle that has been dilated. Scale factors are limited to $\frac{1}{4}$, $\frac{1}{2}$, 2, 3, or 4. The center of the dilation will be the origin. (a)
- Given a preimage in the coordinate plane, identify the coordinates of the image of a polygon that has been translated and reflected over the x - or y -axis, or reflected over the x - or y -axis and then translated. (a)
- Sketch the image of a polygon that has been translated vertically, horizontally, or a combination of both. (a)
- Sketch the image of a polygon that has been reflected over the x - or y -axis. (a)
- Sketch the image of a dilation of a right triangle or a rectangle limited to a scale factor of $\frac{1}{4}$, $\frac{1}{2}$, 2, 3, or 4. The center of the dilation will be the origin. (a)
- Sketch the image of a polygon that has been translated and reflected over the x - or y -axis, or reflected over the x - or y -axis and then translated. (a)

Richmond Public Schools

Curriculum Framework

Grade 8

<ul style="list-style-type: none"> - A reflection of a boat in water shows an image of the boat flipped upside down with the water line being the line of reflection; - A translation of a figure on a wallpaper pattern shows the same figure slid the same distance in the same direction; and - A dilation of a model airplane is the production model of the airplane. 	<ul style="list-style-type: none"> ● Identify the type of translation in a given example. (a, b) ● Identify practical applications of transformations including, but not limited to, tiling, fabric, wallpaper designs, art, and scale drawings. (b)
Vocabulary	Instructional Activities Organized by Learning Objective
<p>Translation Reflection Congruence Preimage Image Dilation Scale Factor Orientation Transformation Prime Line of Reflection Corresponding Point Enlarging Reducing Proportionally Polygon Vertically Horizontally Origin Coordinate Plane X-axis Y-axis</p>	<p>Virginia Department of Education <u>Transformations (in part-exclude rotations)</u> – Lesson Plan</p> <p>Textbook <i>Virginia Pre-Algebra, ©2012, Glencoe/McGraw-Hill</i></p> <ul style="list-style-type: none"> ● Translations and Reflections on the Coordinate Plane, page(s) 103 – 108 ● Dilations, page(s) 311 – 316 (in part) <p>Notes</p> <ul style="list-style-type: none"> ● Geometric Transformations <p>Resources</p> <ul style="list-style-type: none"> ● Print <i>Virginia Coach, NEW SOL Edition, Grade 8, Mathematics</i> Lesson 11 – page 82 (Transformations) ● Technology-based <ul style="list-style-type: none"> ○ <i>ExploreLearning.com (Gizmos) – <u>Translations and Dilations</u>(exclude last question due to scale factor of 75%) – Interactive Instructional Resource</i>

Richmond Public Schools

Curriculum Framework

Grade 8

Assessment	
<p>ReRPS PowerSchool Unit Test – RPS 8.7 Common Assessment Test ID#:</p> <p>Formative Assessments White Board Checks Kahoot.it Plickers Exit Tickets Graphic Organizers Venn Diagrams</p>	<ul style="list-style-type: none"> o <i>Exchange.Smarttech.com (SMART Board) – <u>Translation, Reflection on the Coordinate Plane</u>(exclude slide 13), – SMART Notebook Lesson *SMART Board required</i> o <i>VirtualNerd.com – <u>What is a Translation, How to Translate a Figure, How to Reflect a Figure, What is a Dilation, and How to Dilate a Figure</u> – Instructional Video</i> <p>Station Activities</p> <ul style="list-style-type: none"> ● Transformations on a Map (<u>worksheet</u>) (Do not include rotation) ● Have students draw a preimage in one quadrant, students will sketch a translation, reflection, and dilation on the coordinate plane. ● <u>Task Cards</u> - Have students complete problems in small groups Think-Pair-Share ● Foldable - Have students create a foldable, describing characteristics, providing examples, and relationships. ● Sort - Have students sort cards transformations into their appropriate category.
Cross-Curricular Connections	Differentiations
<p>English Use a Venn Diagram to compare and contrast the different attributes/changes that particular transformations have.</p> <p>History Make a coordinate grid on top of a U. S. Map. Have students start at a particular state and perform a given transformation(s) to determine where they would end up.</p> <p>Art Have students create designs/pictures in the quadrants and then perform transformations. Scale drawings are examples of dilations.</p>	<ul style="list-style-type: none"> ● Have students work in Quadrant I plotting points and transforming them across the coordinate plane. ● Have students use another sheet of paper to trace preimage and show how the figure moves for each transformation. ● Have students create tessellations to explain transformations. ● Have students complete more than one transformation with the same figure.

Richmond Public Schools
Curriculum Framework
Grade 8