

Richmond Public Schools
Curriculum Framework
Grade 8

Strand: Measurement and Geometry	
8.10 The student will solve area and perimeter problems, including practical problems, involving composite plane figures.	
Suggested Pacing	
Third Nine Weeks – 9 Instructional Days (including common assessment)	
Related Standards	
Spiral Down 6.7 The student will <ol style="list-style-type: none"> a) derive π (pi); b) solve problems, including practical problems, involving circumference and area of a circle; and c) solve problems, including practical problems, involving area and perimeter of triangles and rectangles. 	Spiral Up <i>*No Algebra I Spiral</i> G.11 The student will solve problems, including practical problems, by applying properties of circles. This will include determining <ol style="list-style-type: none"> c) arc length; and d) area of a sector
Essential Questions	Common Misconceptions
How does knowing the areas of polygons assist in calculating the areas of composite figures? <i>The area of a composite figure can be found by subdividing the figure into triangles, rectangles, squares, trapezoids, and semi-circles, calculating their areas, and adding the areas together.</i>	<ul style="list-style-type: none"> ● Students have trouble decomposing the figure to find the figures area. ● Students will include lengths inside a shape to compute the perimeter. ● Students have trouble computing the area of the shaded area. ● Students may confuse radius with diameter when using a circular shape in the composite figure.
Understanding the Standard	Essential Knowledge and Skills

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- A plane figure is any two-dimensional shape that can be drawn in a plane.
- A polygon is a closed plane figure composed of at least three line segments that do not cross.
- The perimeter is the path or distance around any plane figure. The perimeter of a circle is called the circumference.
- The area of a composite figure can be found by subdividing the figure into triangles, rectangles, squares, trapezoids, parallelograms, circles, and semicircles, calculating their areas, and combining the areas together by addition and/or subtraction based upon the given composite figure.
- The area of a rectangle is computed by multiplying the lengths of two adjacent sides ($A = lw$).
- The area of a triangle is computed by multiplying the measure of its base by the measure of its height and dividing the product by 2 or multiplying by $\frac{1}{2}$ ($A = \frac{bh}{2}$ or $A = \frac{1}{2}bh$).
- The area of a parallelogram is computed by multiplying the measure of its base by the measure of its height ($A = bh$).
- The area of a trapezoid is computed by taking the average of the measures of the two bases and multiplying this average by the height ($A = \frac{1}{2}h(b_1 + b_2)$).
- The area of a circle is computed by multiplying pi times the radius squared ($A = \pi r^2$).
- The circumference of a circle is found by multiplying pi by the diameter or multiplying pi by 2 times the radius ($C = \pi d$ or $C = 2\pi r$).

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

- Subdivide a plane figure into triangles, rectangles, squares, trapezoids, parallelograms, and semicircles. Determine the area of subdivisions and combine to determine the area of the composite plane figure.
- Subdivide a plane figure into triangles, rectangles, squares, trapezoids, parallelograms, and semicircles. Use the attributes of the subdivisions to determine the perimeter of the composite plane figure.
- Apply perimeter, circumference, and area formulas to solve practical problems involving composite plane figures.

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<ul style="list-style-type: none"> The area of a semicircle is half the area of a circle with the same diameter or radius. 	
Vocabulary	Instructional Activities Organized by Learning Objective
<p>Plane Figure Two-Dimensional Shape Triangles Rectangles Square Trapezoids Parallelograms Circles Diameter Radius Area Perimeter Subdivide Circumference Semi-circle Polygon Composite Figure Adjacent Side</p>	<p>Virginia Department of Education Area and Perimeter – Lesson Plan</p> <p>Textbook <i>Virginia Pre-Algebra</i>, ©2012, Glencoe/McGraw-Hill</p> <ul style="list-style-type: none"> Perimeter and Area, page(s) 223 – 228 Area of Parallelograms, Triangles, and Trapezoids, page(s) 662 – 668 Circles and Circumference, page(s) 671 – 675 Area of Circles, page(s) 678 – 683 Area of Composite Figures, page(s) 684 - 689 <p>Notes</p> <ul style="list-style-type: none"> Find the Area of Polygons <p>Resources</p> <ul style="list-style-type: none"> Print <i>Virginia Coach</i>, NEW SOL Edition, Grade 8, Mathematics Lesson 14 – page 102 (Area and Perimeter of Composite Figures)
Assessment	
<p>RPS PowerSchool Unit Test – RPS 8.10 Common Assessment Test ID#:</p> <p>Formative Assessments Kahoot.it Plickers Exit Tickets</p>	<ul style="list-style-type: none"> Technology-based <ul style="list-style-type: none"> LearnZillion <ul style="list-style-type: none"> Solve the area of a Composite Figure – Instructional Video <i>VirtualNerd</i>

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Graphic Organizers	<ul style="list-style-type: none">▪ What is a Composite Figure? - Instructional Video○ YouTube<ul style="list-style-type: none">▪ Area of Composite Shape - Instructional Video <p>Station Activities</p> <ul style="list-style-type: none">● Give students set of paper composite figures, students will divide(cut) the figures and compute the area.● Give students tangrams, students will build composite figures and compute the perimeter.● Task Cards - Have students complete problems in small groups Think-Pair-Share● Finding Area QR Task Cards
Cross-Curricular Connections	Differentiations
<p>English Explain to someone who was absent the process of finding the area and perimeter of a composite figure.</p> <p>History Discuss the importance of a ship in a period of history. Have students draw a blueprint of one of the sides of the ship, on graph paper. Calculate the area and perimeter of the blue-print.</p>	<ul style="list-style-type: none">● Have students outline a given plane figure and find the perimeter, have students shade inside the plane figure and find area.● Have students write the name of shapes that make the composite figure. Next have students divide(cut) the composite figure.● Review area, perimeter, and circumference for a square, rectangle, triangle, and a circle.