

**COVERING AND SURROUNDING Two-Dimensional Measurement**

<p><b>Instructional Time and Investigations</b></p>	<p>22 <math>\frac{1}{2}</math> days</p>	<ul style="list-style-type: none"> <li>• Inv. 1: Designing Bumper Cars: Extending and Building on Area and Perimeter (3 Problems)</li> <li>• Inv. 2: Measuring Triangles (4 Problems)</li> <li>• Inv. 3: Measuring Parallelograms (4 Problems)</li> <li>• Inv. 4: Measuring Surface Area and Volume (3 Problems)</li> </ul>	
<p><b>Goals</b></p>	<p><b>Area and Perimeter:</b> Understand area and perimeter as a measure.</p> <ul style="list-style-type: none"> <li>• Perimeter is a measure of linear units needed to surround a two-dimensional shape and that area is a measure of square units needed to cover a two-dimensional shape.</li> <li>• A fixed number of area units can be enclosed by many different perimeters, and a fixed number of perimeter units can enclose many different areas.</li> <li>• Formulas for the area and perimeter of a rectangle can help you solve problems by reasoning about the relationship between values.</li> </ul>	<p><b>Area and Perimeter of Parallelograms and Triangles:</b> Understand area and perimeter of parallelograms and triangles.</p> <ul style="list-style-type: none"> <li>• Linear measurements of the base, height, and slanted height of parallelograms and triangles are essential to finding the area and perimeter of these shapes.</li> <li>• The area of a triangle and the area of a parallelogram are related to each other and to the area of a rectangle.</li> <li>• There are many triangles (and parallelograms) that can be drawn with the same base and height.</li> <li>• Polygons and irregular figures can be decomposed into triangles and rectangles to find the area of the figures.</li> </ul>	<p><b>Surface Area of Prisms and Pyramids and Volume of Rectangular Prisms:</b> Understand the surface area and volume of a three-dimensional shape.</p> <ul style="list-style-type: none"> <li>• The volume of a prism is a measure in cubic units of the capacity of the prism and can be thought of as multiplying a base layer of unit cubes by the number of layers needed to fill the prism.</li> <li>• Surface areas of three-dimensional solids can be found by adding the areas of the faces.</li> </ul>
<p><b>Common Core Standards</b></p>	<p><b>Common Core Standards for Mathematical Practice</b></p> <p><b>MP.1:</b> Make sense of problems and persevere in solving them.</p> <p><b>MP.2:</b> Reason abstractly and quantitatively.</p> <p><b>MP.3:</b> Construct viable arguments and critique the reasoning of others.</p> <p><b>MP.4:</b> Model with mathematics.</p> <p><b>MP.5:</b> Use appropriate tools strategically.</p> <p><b>MP.6:</b> Attend to precision.</p> <p><b>MP.7:</b> Look for and make use of structure.</p> <p><b>MP.8:</b> Look for and express regularity in repeated reasoning.</p> <p><b>Common Core Content Standards</b></p> <p><b>6.EE.C.9:</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>6.G.A.1:</b> Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.</p> <p><b>6.G.A.2:</b> Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas <math>V = lwh</math> and <math>V = bh</math> to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</p> <p><b>Also 6.NS.C.8, 6.EE.A.2, 6.EE.A.2a, 6.EE.A.2c, 6.EE.A.3, 6.EE.A.4, 6.EE.B.6, 6.G.A.3, 6.G.A.4</b></p>		

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**Content Connections to Other Units**

Goals of the Unit	Prior Work	Future Work
<p><b>Area and Perimeter:</b> Understand area and perimeter as a measure.</p>	<ul style="list-style-type: none"> <li>• Side lengths of polygons (<i>Elementary School</i>)</li> <li>• Finding area of rectangles by covering and counting (<i>Elementary School</i>)</li> <li>• Finding area of nonrectangular shapes by composing and decomposing into rectangles (<i>Elementary School</i>)</li> <li>• Exploring the relationship between area and perimeter (<i>Elementary School</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• Finding the area and side lengths of shapes on a coordinate grid (<i>Looking for Pythagoras</i>)</li> <li>• Studying two-dimensional (surface area, square units) and three-dimensional (volume, cubic units) measures of figures (<i>Decimal Ops; Accentuate the Negative; Stretching and Shrinking; Filling and Wrapping; Frogs, Fleas, and Painted Cubes; Say It With Symbols</i>)</li> </ul>
<p><b>Area and Perimeter of Parallelograms and Triangles:</b> Understand area and perimeter of parallelograms and triangles.</p>	<ul style="list-style-type: none"> <li>• Finding area of nonrectangular shapes by composing and decomposing into rectangles (<i>Elementary School</i>)</li> <li>• Exploring the relationship between area and perimeter (<i>Elementary School</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• Finding the area and side lengths of shapes on a coordinate grid (<i>Looking for Pythagoras</i>)</li> <li>• Studying two-dimensional (surface area, square units) and three-dimensional (volume, cubic units) measures of figures (<i>Filling and Wrapping; Say It With Symbols</i>)</li> </ul>
<p><b>Surface Area of Prisms and Pyramids and Volume of Rectangular Prisms:</b> Understand the surface area and volume of a three-dimensional shape.</p>	<ul style="list-style-type: none"> <li>• Using rectangular models to perform operations with rational numbers, understand the Distributive Property, and find factor pairs of whole numbers (<i>Prime Time, Let's Be Rational</i>)</li> <li>• Collecting data and looking for and generalizing patterns (<i>Prime Time</i>)</li> <li>• Performing operations with rational numbers; estimating sums of rational numbers (<i>Prime Time, Let's Be Rational</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• Studying two-dimensional (surface area, square units) and three-dimensional (volume, cubic units) measures of figures</li> <li>• Finding surface area and volume of three-dimensional figures (<i>Filling and Wrapping</i>)</li> <li>• Studying the relationship between the dimensions and volume of a prism (<i>Filling and Wrapping; Say It With Symbols</i>)</li> <li>• Developing strategies and algorithms for finding the surface area and volume of prisms, cylinders, cones, and spheres (<i>Filling and Wrapping; Say It With Symbols</i>)</li> <li>• Using the Distributive Property to solve equations and factor algebraic expressions (<i>Decimal Ops; Accentuate the Negative; Moving Straight Ahead; Frogs, Fleas, and Painted Cubes</i>)</li> <li>• Comparing areas of two-dimensional shapes to test for similarity (<i>Stretching and Shrinking</i>)</li> </ul>