	STRETCHING AND SHRINKING Understanding Similarity	
Instructional Time and Investigations	19 days	• Inv. 1: Enlarging and Reducing Shapes (2 Problems) • Inv. 2: Similar Figures (3 Problems) • Inv. 3: Scaling Perimeter and Area (4 Problems) • Inv. 4: Similarity and Ratios (4 Problems)
Goals	**Similar Figures:** Understand what it means for figures to be similar. • Similar figures have congruent corresponding angles, and corresponding side lengths are in a proportional relationship. • Algebraic rules can be used to stretch or shrink a shape into a new shape that is similar or nonsimilar to the original image.	**Reasoning with Similar Figures:** Develop strategies for using similar figures to solve problems. • The scale factor for two similar figures is established by finding the ratio of a pair of corresponding sides. Scale factor, used with other tools, allows you to make drawings of similar figures and to compare the perimeters and areas of similar figures. • If two figures are similar, then you can use a proportional relationship between corresponding sides to find unknown side lengths. This can be used to solve real-world problems, finding distances and measurements that cannot be measured directly.
Common Core Standards	**Common Core Standards for Mathematical Practice** **MP.1:** Make sense of problems and persevere in solving them. **MP.2:** Reason abstractly and quantitatively. **MP.3:** Construct viable arguments and critique the reasoning of others. **MP.4:** Model with mathematics. **MP.5:** Use appropriate tools strategically. **MP.6:** Attend to precision. **MP.7:** Look for and make use of structure. **MP.8:** Look for and express regularity in repeated reasoning.	**Common Core Content Standards** **7.RP.A.2:** Recognize and represent proportional relationships between quantities. **7.RP.A.3:** Use proportional relationships to solve multistep ratio and percent problems. **7.EE.B.3:** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. **7.G.A.1:** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. **7.G.A.2:** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. **Also 7.RP.A.2a–b, 7.EE.B.4, 7.G.B.6**

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Content Connections to Other Units

Goals of the Unit	Prior Work	Future Work
Similar Figures: Understand what it means for figures to be similar.	• Finding angle measures, lengths, and areas of plane geometric figures (*Covering and Surrounding; Shapes and Designs*) • Developing and applying concepts of vertex, angle, angle measure, side, and side length (*Covering and Surrounding; Shapes and Designs*) • Constructing two–dimensional shapes (*Shapes and Designs*) • Using symbols to communicate operations (*Variables and Patterns; Accentuate the Negative*) • Exploring symmetries of a figure (*Shapes and Designs*)	• Scaling quantities, objects, and shapes up and down (*Comparing and Scaling; Filling and Wrapping; Butterflies, Pinwheels, and Wallpaper*) • Analyzing how two-dimensional shapes are affected by rotations, reflections, translations, and dilations; generating isometric transformations (*Butterflies, Pinwheels, and Wallpaper*) • Finding the equation of a line (*Comparing and Scaling; Moving Straight Ahead; Thinking With Mathematical Models*) • Expressing linear relationships with symbols (*Comparing and Scaling; Moving Straight Ahead; Thinking With Mathematical Models; Growing, Growing, Growing*) • Determining whether linear expressions are equivalent (*Say It With Symbols*) • Writing directions for isometries in two dimensions (*Butterflies, Pinwheels, and Wallpaper; Function Junction*)
Reasoning with Similar Figures: Develop strategies for using similar figures to solve problems.	• Using factors and multiples (*Prime Time*) • Measuring two-dimensional figures (*Covering and Surrounding*) • Using ratios in fraction form (*Comparing Bits and Pieces; Let's Be Rational; Decimal Ops*) • Using maps (*Variables and Patterns*) • Exploring properties of two-dimensional shapes; finding areas, perimeters, and side lengths of shapes (*Covering and Surrounding; Shapes and Designs*)	• Scaling and comparing figures and quantities (*Comparing and Scaling*) • Using slope to solve problems involving linear relationships (*Moving Straight Ahead; Thinking With Mathematical Models*) • Exploring ratios and proportional relationships (*Comparing and Scaling; Moving Straight Ahead*) • Developing the concept of slope (*Moving Straight Ahead; Thinking With Mathematical Models*)