

Richmond Public Schools

Curriculum Framework

7th Grade Math

Strand: Measurement and Geometry	
7.5 The student will solve problems, including practical problems, involving the relationship between corresponding sides and corresponding angles of similar quadrilaterals and triangles.	
Suggested Pacing	
Third Nine Weeks – 5 days	
Spiraling Standards	
<p>Spiraling Down:</p> <p>6.1 The student will represent relationships between quantities using ratios, and will use appropriate notations, such as $\frac{a}{b}$, a to b, and a:b.</p> <p>6.12 The student will</p> <ol style="list-style-type: none">represent a proportional relationship between two quantities, including those arising from practical situations;determine the unit rate of a proportional relationship and use it to find a missing value in a ratio table;determine whether a proportional relationship exists between two quantities;	<p>Spiraling Up:</p> <p>8.4 The student will solve practical problems involving consumer applications.</p>
Essential Questions	Common Misconceptions
<p>How do triangles and quadrilaterals that are similar compare to ones that are congruent.</p> <p><i>Congruent polygons have the same shape and size. Similar polygons have the same shape and corresponding angles but are different in size.</i></p>	<ul style="list-style-type: none">Students are unable to identify correspondence in shapes which result in proportions set up improperly.Students are unable to identify corresponding sides when shapes are rotated.

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Do all triangles and all quadrilaterals have the same angle sum?

All triangles have an angle sum of 180, and all quadrilaterals have an angle sum of 360, regardless of size.

- Students have trouble with cross multiplication. Using equivalent fractions will help.
- Students cross multiply but do not divide by the coefficient to find the value of the missing variable.
- Students struggle to solve one-step equations

Understanding the Standard

- Similar polygons have corresponding sides that are proportional and corresponding interior angles that are congruent.
- Similarity has practical applications in a variety of areas, including art, architecture, and the sciences.
- Similarity does not depend on the position or orientation of the figures.
- Congruent polygons have the same size and shape. Corresponding angles and sides are congruent.
- Congruent polygons are similar polygons for which the ratio of the corresponding sides is 1:1. However, similar polygons are not necessarily congruent.
- The symbol \sim is used to represent similarity. For example, $\triangle ABC \sim \triangle DEF$.
- The symbol \cong is used to represent congruence. For example, $\angle A \cong \angle B$
- Similarity statements can be used to determine corresponding parts of similar figures such as:

Essential Knowledge and Skills

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

- Identify corresponding sides and corresponding congruent angles of similar quadrilaterals and triangles.
- Given two similar quadrilaterals or triangles, write similarity statements using symbols.
- Write proportions to express the relationships between the lengths of corresponding sides of similar quadrilaterals and triangles.
- Solve a proportion to determine a missing side length of similar quadrilaterals or triangles.
- Given angle measures in a quadrilateral or triangle, determine unknown angle measures in a similar quadrilateral or triangle.

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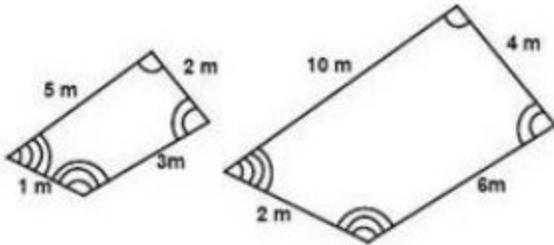
Given: $\triangle ABC \sim \triangle DEF$

$\angle A$ corresponds to $\angle D$

\overline{AB} corresponds to \overline{DE}

· A proportion representing corresponding sides of similar figures can be written as $\frac{a}{b} = \frac{c}{d}$.

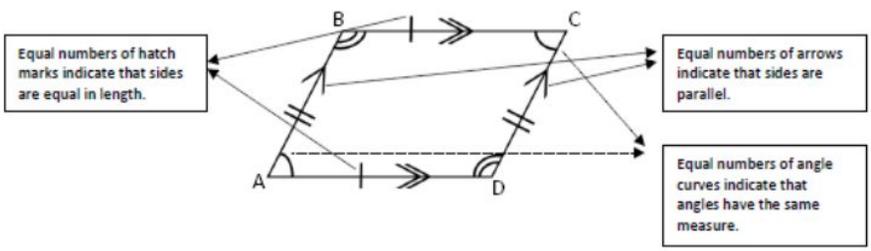
- Example: Given two similar quadrilaterals with corresponding angles labeled, write a proportion involving corresponding sides.



$\frac{5}{10} = \frac{2}{4}$ or $\frac{5}{10} = \frac{3}{6}$ or $\frac{1}{2} = \frac{2}{4}$ are some of the ways to express the proportional relationships that exist.

· The traditional notation for marking congruent angles is to use a curve on each angle. Denote which angles are congruent with the same number of curved lines. For example, if $\angle A$ is congruent to $\angle C$, then both angles will be marked with the same number of curved lines.

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· Congruent sides are denoted with the same number of hatch (or hash) marks on each congruent side. For example, a side on a polygon with 2 hatch marks is congruent to the side with 2 hatch marks on a congruent polygon or within the same polygon.

Vocabulary	Instructional Activities Organized by Learning Objective
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<p>Quadrilateral Triangle Congruent/ Congruence Non-Congruent Similar Figures Similarity Corresponding/Correspondence Proportion/Proportional Ratio Numerator Denominator Angle Angle Measure Angle Length Line Segment Cross Multiply</p>	<p>VDOE <u>Similar Figures</u>(in part - students no longer need to determine similarity)</p> <p>Textbook Virginia Math Connects, Course 2, ©2012, Price, et al, McGraw-Hill School Education Group 1: Similar Figures, page(s) 293 – 298(in part)</p> <p>Notes <u>7.5 – Similar Figures</u>(in part)</p> <p>Resources</p> <ul style="list-style-type: none"> ● Print <ul style="list-style-type: none"> ○ Virginia Coach, New SOL Edition, Mathematics, Grade 7, @2018, Triumph Learning pg(s) 83 - 90 ○ <u>Algebra Readiness - Working with Ratios and Proportions</u> pg(s) 36 - 43
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<p>Equivalent Ratios Variable Coefficient Inverse</p>	<ul style="list-style-type: none"> ● Technology-based <ul style="list-style-type: none"> ○ Brain Pop <ul style="list-style-type: none"> ■ Similar Figures ○ Learn Alberta <ul style="list-style-type: none"> ■ Explore Similarity Video and Interactive ○ Kahoot! <ul style="list-style-type: none"> ■ Missing Values ○ Gizmos <ul style="list-style-type: none"> ■ Similar Figures <p>Stations Similar Figures Stations Activity with Extensions (remove problem 3, 6 and 17)</p>
<p>Assessment</p>	
<p>Cross-Curricular Connections</p>	<p>Tiered Differentiations</p>
<p>Language Arts – Students will first learn what the geometry root words mean, like tri means three, quad means 4, etc. Then students will guess the meaning of larger words without given any information about them, such as bilateral.</p>	<p>(Tier 1) Students will be given similar triangles and asked to set-up proportions, identify the unknown value, and finally identify the scale factors used.</p> <p>(Tier 2) Students are given similar triangles and asked to find a missing length by first identifying coordinating sides, then by setting up a proportion and finally solving for the unknown. Students will follow this process for each problem.</p> <p>(Tier 3) Students are given similar triangles and a corresponding proportion with one unknown. Students will be guided through color coding the figures to identify corresponding sides, then doing the same with the given proportion. Finally students will use the butterfly method to circle, multiply and divide in order to find the missing value.</p>

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