

**Mathematics Grade 8  
Horizontal Alignment Planning Guide  
Second Six-Weeks**

Revised 09-05-06

<b>Learning Focus 2.1 – Applying Proportional Relationships</b> Investigate the difference between proportional and non-proportional relationships through application problems involving unit rate, factor of change, similar figures, and graphical representations.					
<b>Key Concepts</b> <ul style="list-style-type: none"> <li style="width: 33%;">• Unit rate</li> <li style="width: 33%;">• Rate</li> <li style="width: 33%;">• Finding the missing value in a proportion</li> <li style="width: 33%;">• Factor of change</li> <li style="width: 33%;">• Cost comparisons – finding the best buy</li> <li style="width: 33%;">• Measurement conversions</li> <li style="width: 33%;">• Dimensional analysis</li> </ul>					
HISD Objectives	Time Allocation	Assessment Connections	Instructional Considerations	Instructional Strategies	Resources
<p><b>MATH.8.1.02</b> Select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships.</p> <p><b>MATH.8.1.07</b> Use a variety of strategies to evaluate the reasonableness of a solution.</p> <p><b>MATH.8.1.08</b> Determine the unit rate for a proportional relationship and use multiplication by a constant factor (unit rate) to represent a proportional relationship as a function.</p> <p><b>MATH.8.2.02</b> Use intuitive methods as well as procedural methods to solve application problems involving proportional relationships such as similarity and rates.</p> <p><b>MATH.8.2.05</b> Predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations.</p> <p><b>MATH.8.6.01</b> Identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics.</p>	<p>3 90-minute lessons</p> <p>or</p> <p>6 45-minute lessons</p>	<p>T(Obj1)</p> <p>T(Obj1)</p> <p>T(Obj1)</p> <p>T(Obj2)</p> <p>T(Obj2)</p> <p>T(Obj6)</p>	<ul style="list-style-type: none"> <li>• Use a price graph to review unit rates: ounces on the x-axis as the independent variable and cost on the y-axis as the dependent variable determined by the <math>\frac{y}{x}</math> ratio. Construct tables from the graphs for each of several products. Remind student that the <math>\frac{y}{x}</math> ratio with <math>x = 1</math> is the unit rate. Using grocery ads, the students should do product comparisons, create comparison price graphs, cost tables, and write a report detailing the best buys.</li> <li>• Students should use common linear measurement conversions to complete tables, draw graphs, and answer questions involving the relationships observed.</li> <li>• Application problems using map scales are commonly assessed as examples of proportional reasoning. Students need to be proficient at reading the scale from various types of maps. They should be able to write a proportion based on the scale, and create a table of destinations applying the scale.</li> </ul>	<p>After students have mastered the intuitive strategies of solving proportions such as factor of change, the more formalized or algorithmic procedures such as cross-products may be introduced.</p> <p>In science class, students are often taught a method of converting measurements that is called dimensional analysis. This is a technique used to “chain” conversions using unit rates.</p>	<p>CLEAR MLU 2, Lesson 4 (Cost Comparisons) CLEAR MLU 3, Lesson 1 (Measurement Ratios) CLEAR MLU 2, Lesson 8 (Map Scale)</p> <p><i>Middle School TEXTEAMS Modules: Proportionality Across the TEKS</i>, Dana Center, Austin, TX</p> <p><i>Connected Mathematics: Stretching and Shrinking</i>, Investigation 4.4, Lappan, et al, Prentice Hall.</p> <p><i>Passport to Algebra and Geometry</i>, McDougall Littell.</p> <p>Region IV Benchmark Assessments: <a href="http://www.mathbenchmarks.org">www.mathbenchmarks.org</a>: (8<sup>th</sup> grade – Objectives 8.1.B., 8.2.D., 8.3.B.)</p> <p>Assessment Activity: MLU 3, Lesson 7</p> <p><i>Problem-Solving Experiences in Mathematics</i>, Grade 8, Dale Seymour Publications.</p> <p><i>Problem Solving with Ratio and Proportions</i>, Creative Publications</p>



*What is it we want all students to learn?*

Objective Code Key:  
EL – Content Area, Grade, Strand, Objective  
HS – Course, Strand, Objective

T - Assessed on TAKS at grade level  
(Obj) = TAKS objective tested  
\*(x) - Assessed on TAKS at specified grade level

MLU – Model Lesson Unit

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## Mathematics Grade 8 Horizontal Alignment Planning Guide Second Six-Weeks

Revised 09-05-06

<b>Learning Focus 2.3 - Applying the Properties of Similarity</b> Students determine if figures are similar, recognize similar figures when one of the figures is at a different orientation, and use proportional relationships in similar shapes to find missing measurements. Enlargements, reductions, and indirect measurement are explored and applied.					
<b>Key Concepts</b> <ul style="list-style-type: none"> <li style="width: 33%;">• Properties of similar figures</li> <li style="width: 33%;">• Dilations</li> <li style="width: 33%;">• Indirect measurements</li> <li style="width: 33%;">• Finding missing measurements in similar figures</li> </ul>					
HISD Objectives	Time Allocation	Assessment Connections	Instructional Considerations	Instructional Strategies	Resources
<p><b>MATH.8.3.01</b> Generate similar figures using dilations including enlargements and reductions and describe the relationship between the pre-image and the image using scale factor and magnitude.</p> <p><b>MATH.8.3.02</b> Graph dilations, reflections, and translations on a coordinate plane and describe the relationships between the pre-image and the image.</p> <p><b>MATH.8.3.04</b> Use geometric concepts (including symmetry, similarity, congruence, and transformations) and properties of two- and three-dimensional shapes to solve problems in fields such as art and architecture.</p> <p><b>MATH.8.3.06</b> Locate and name points on a coordinate plane using ordered pairs of rational numbers.</p> <p><b>MATH.8.4.05</b> Use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements.</p>	5 90-minute lesson  or  10 45-minute lessons	T(Obj3)          T(Obj3)          T(Obj3)          T(Obj3)          T(Obj4)	<p>Begin with an activity using right triangles and discuss their properties. When moving into creating similar triangles, remind students to identify the following characteristics:</p> <ul style="list-style-type: none"> <li>• proportional relationship</li> <li>• angles</li> <li>• area (discuss the change in area in relation to the scale factor)</li> </ul> <p>Setting up and solving proportions to find missing measurements should be illustrated in both intuitive and formal methods. Students often use scale factor (the factor of change method) intuitively. Using the formal cross-product method should be an extension of this understanding. Be sure to include nested figures in student practice.</p> <p>Enlargements and reductions should be modeled and the relationships between the resulting figures should be explored and tied to similarity. Using figures on a coordinate plane, students can apply previous knowledge of graphing ordered pairs and finding side lengths and area. The proportional relationship of area is not often transparent to students and should be “discovered” using hands-on activities.</p>	<p>Move into using other figures to demonstrate similarity such as rectangles and parallelograms. Compare and contrast their applications with those of triangles.</p>	<p>CLEAR MLU 2, Lessons 5 – 7 CLEAR MLU 3, Lessons 5 – 6</p> <p><i>Connected Mathematics: Stretching and Shrinking</i>, Investigations 2 and 5, Lappan, et al, Prentice Hall.</p> <p><i>Passport to Algebra and Geometry</i>, McDougall Littell.</p> <p>Region IV Benchmark Assessments: <a href="http://www.mathbenchmarks.org">www.mathbenchmarks.org</a>: (8<sup>th</sup> grade – Objectives 8.2.D., 8.5.A.)</p> <p>Assessment Activity: MLU 3, Lesson 7</p> <p><i>Middle School TEXTEAMS Modules: Proportionality Across the TEKS</i>, Dana Center, Austin, TX</p> <p><i>Problem-Solving Experiences in Mathematics</i>, Grade 8, Dale Seymour Publications.</p> <p><i>Problem Solving with Ratio and Proportions</i>, Creative Publications</p>



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