

## Mathematics 8 Additions/Revisions

New TEKS Student Expectation 8.1E

[Compare and order real numbers with a calculator](#)

<b>Learning Focus 5.3 – Square Roots, Irrational Numbers, and the Pythagorean Theorem</b> Students explore the relationships involved in side lengths of right triangles and squares. Their explorations lead to a discovery of irrational numbers, square roots, and the Pythagorean Theorem					
HISD Objectives	Time Allocation	Assessment Connections	Instructional Considerations	Instructional Strategies	Resources
<p><b>Add new HISD objective to page 8 of HAPG5:</b></p> <p><b>MATH.8.1C</b> Approximate (mentally and with calculators) the value of irrational numbers (such as pi and <math>\sqrt{2}</math>) as they arise from algebraic or geometric problem situations.</p> <p><b>MATH.8.1E</b> <u><a href="#">Compare and order real numbers with a calculator.</a></u></p>	<p><b>No additional time required</b></p>	<p><b>No changes required</b></p>	<p><b>Add new information to existing information on pages 8 and 9 of HAPG5:</b></p> <p>Assist students in reinforcing Power Objective 8.15A and Objective 8.1E by walking the them through a verbalization of the concept of square root with questioning such as:</p> <ul style="list-style-type: none"> <li>• What number multiplied by itself is 4?</li> <li>• What number can then be called the square root of 4?</li> <li>• So, what number multiplied by itself is 5?</li> <li>• What then is the measure of the side of a square with area 5? How can we draw <math>\sqrt{5}</math> ?</li> <li>• How can you compute the <math>\sqrt{5}</math> ?</li> <li>• Is it a “nice” number? An “exact” number? How can you tell?</li> <li>• Can you find a decimal approximation?</li> <li>• How could you use a calculator to assist you?</li> </ul>	<p><b>Add new information to existing information on page 8 of HAPG5:</b></p> <p>Students should review the skills of computing square roots using a graphing calculator and be able to compare and order the values of given square roots. The use of a number line to record square roots and their calculated values is a visual way to help students with these concepts. A quick review of the activity <u><a href="#">Irrational Numbers on the Line</a></u> from Learning Focus 1.2 may be helpful.</p> <p>The power of the Pythagorean Theorem is best illustrated by using verbal problems that apply the theorem in various situations. Finding distances on maps and making indirect measurements are common applications (Power Objective 8.15A). It is of particular importance that students use a calculator when solving application problems involving the Pythagorean Theorem (Objective 8.1E).</p>	<p><b>Add new information to existing information on pages 8 and 10 of HAPG5:</b></p> <p>The following clarifying activities involve multiple hands-on or problem-solving opportunities. Scaffolding questions and/or extensive teacher notes are included.</p> <ul style="list-style-type: none"> <li>• <u><a href="#">Irrational Numbers on the Line</a></u> (this activity may be found in the supporting documents for the 8<sup>th</sup> grade HAPG for the first six weeks)</li> </ul>

Revised TEKS objective 8.2D

Use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems

Learning Focus 2.1 – Applying Proportional Relationships					
Students solve application problems involving proportional relationships such as unit rate, factor of change, and graphs.					
HISD Objectives	Time Allocation	Assessment Connections	Instructional Considerations	Instructional Strategies	Resources
<p><b>Add revised HISD objectives (revisions indicated by underlined text) to page 2 of HAPG2:</b></p> <p><b>MATH.8.2D</b> Use multiplication by a <u>given</u> constant factor (<u>including</u> unit rate) to represent and <u>solve problems involving</u> proportional relationships as functions and determine the unit rate for a proportional relationship <u>including conversions between measurement systems.</u></p>	<p><b>No additional time required</b></p>	<p><b>No changes needed.</b></p>	<p><b>Existing information of special note on page 2 of HAPG2:</b></p> <p><u>Comparison</u> of attributes can be made within and between customary and metric <u>measurement</u> systems.</p> <ol style="list-style-type: none"> <li>How do you convert between units of measure within the same system?</li> <li>How are the customary and metric measurement systems different and/or similar?</li> <li>How is proportional reasoning used to solve measurement problems?</li> </ol>	<p><b>Add new information to existing information on page 2 of HAPG2:</b></p> <p><b>Cooperative Learning</b> In small groups, students should complete application problems/activities that involve:</p> <ul style="list-style-type: none"> <li><a href="#">Measurement Ratios</a> Use common linear measurement conversions <b>within and between systems</b> (conversion ratios) to complete tables, construct graphs, and answer questions involving the relationships observed. Students learn the strategy of dimensional analysis (see Resources column).</li> </ul>	<p><b>Existing resources of special note in HAPG2:</b></p> <p>The following clarifying activities involve multiple hands-on opportunities. Scaffolding questions and extensive teacher notes are included.</p> <ul style="list-style-type: none"> <li><a href="#">Measurement Ratios</a></li> </ul>

Revised TEKS objective 8.12A

Use variability (range, including interquartile range (IQR)) and select the appropriate measure of central tendency or range to describe a set of data and justify the choice for a particular situation.

<b>Learning Focus 4.2 – Data Collection and Data Analysis</b> Students explore data collection and use graphical representations to create data displays (histograms, circle graphs, scatter plots, stem and leaf plots, and box and whisker plots) of real-world situations. They use displays and statistical measures of central tendency <b>and variability</b> to analyze, interpret, make predictions, and determine misuses of the data.											
HISD Objectives	Time Allocation	Assessment Connections	Instructional Considerations	Instructional Strategies	Resources						
<p><b>Add revised HISD objectives (revisions indicated by underlined text) to page 4 of HAPG4:</b></p> <p>Ⓢ <b>MATH.8.12A</b>  <u>Use variability (range, including interquartile range (IQR))</u>, select the appropriate measure of central tendency or range to describe a set of data, justify the selection for a particular situation, and identify the missing piece of data that will produce a target mean, median, mode, and/or range for a data set.</p>	<p><b>No additional time required</b></p>	<p><b>No changes needed</b></p>	<p><b>Add new information to existing information on page 5 of HAPG4:</b></p> <p>Students have operated with measures of central tendency previously and now need to move to the application and analysis levels. <b>Students should be introduced to the use of range and interquartile range (IQR) as measures of variability using box and whisker plots.</b> However, statistical analysis of both measures of central tendency and variability should also be included in the analysis of other types of charts and graphs as well.</p> <p><b>Vocabulary:</b></p> <table border="1"> <thead> <tr> <th>Academic</th> <th>Content-Specific</th> </tr> </thead> <tbody> <tr> <td></td> <td>Measures of Variability</td> </tr> <tr> <td></td> <td>Interquartile range (IQR)</td> </tr> </tbody> </table>	Academic	Content-Specific		Measures of Variability		Interquartile range (IQR)	<p><b>Add new information to existing information on page 4 of HAPG4:</b></p> <p>Box and whisker plots are easily created using graphing calculators, however, having students record these plots with paper and pencil as well provides an opportunity for discussion and review of measures of central tendency and the introduction of new vocabulary such as <i>measures of variability</i> and <i>interquartile range (IQR)</i>.</p>	<p><b>Add new information to existing information on page 4 of HAPG4:</b></p> <p><a href="#">How Many States Have You Visited</a> is a beginner activity for students using the TI-84. Students will collect data from the class and create a Box &amp; Whisker plot based on how many states students have visited. There is a step-by-step process for students new to using 'stat plots.'</p>
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