

# HPISD Grade 4 Mathematics

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UNIT NAME	ESTIMATED DURATION	9 WEEKS		
<b>UNIT 5: MEASUREMENT</b>	<b>6 WEEKS</b>	1	2	<b>3</b>
<b>Unit Overview</b>				
<ul style="list-style-type: none"> <li>Concepts of measurement to solve problems involving angles in degrees, drawing angles, and determining the measure of an unknown angle</li> <li>Applications of appropriate customary and metric units, strategies, and tools to solve problems involving measurement</li> </ul>				
<b>Enduring Understandings</b>				
The student will understand that:	<ul style="list-style-type: none"> <li>The perimeter and area of a rectangular objects depends on their dimensions</li> <li>All measurements are approximations</li> <li>Elapsed time is the measure of the duration of an event</li> </ul>			
<b>Concepts</b>				
Measurement Comparison Patterns Estimation	<ul style="list-style-type: none"> <li>Some attributes of objects are measureable and can be quantified using unit amounts.</li> <li>Numbers, expressions, and measures can be compared by their relative values.</li> <li>Relationships can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways.</li> <li>Numerical calculations can be approximated by replacing numbers with other numbers that are close and easy to compute with mentally. Measurement can be approximated using known referents as the unit in the measurement process.</li> </ul>			
<b>Guiding/Essential Questions</b>				
<ol style="list-style-type: none"> <li>1. What tools and units are used to measure the attributes of an object?</li> <li>2. How can patterns be used to determine standard formulas for area and perimeter?</li> <li>3. How are perimeter, area and volume related?</li> <li>4. Why are all measurements approximations?</li> <li>5. What is the difference between length of time and time of day?</li> <li>6. How can measurement be converted to solve problems?</li> <li>7. How are measured angles added and subtracted?</li> </ol>				
<b>Learning Targets</b>			<b>Learning Progressions</b>	
<u>Prerequisite:</u> <ul style="list-style-type: none"> <li>The student will determine when it is appropriate to use measurements of liquid volume (capacity) or weight</li> </ul>			<ul style="list-style-type: none"> <li>Create benchmarks and mental images for measurement units within the customary and metric systems</li> </ul>	

- The student will determine liquid volume (capacity) or weight using appropriate units and tools.

Learning Target:

- The student will select appropriate customary and metric units, strategies, and tools to solve problems involving measurement

5<sup>th</sup> Grade Connection:

- The student will solve problems by calculating conversions within a measurement system, customary or metric

- Understand prefixes for metric units such as “kilo” means a thousand, so 3000m is equal to 3km
- Convert measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit.

Example:

Charlie and 10 friends are planning for a pizza party. They purchased 3 quarts of milk. If each glass holds 8oz will everyone get at least one glass of milk?

possible solution: Charlie plus 10 friends = 11 total people

$$11 \text{ people} \times 8 \text{ ounces (glass of milk)} = 88 \text{ total ounces}$$

$$1 \text{ quart} = 2 \text{ pints} = 4 \text{ cups} = 32 \text{ ounces}$$

$$\text{Therefore } 1 \text{ quart} = 2 \text{ pints} = 4 \text{ cups} = 32 \text{ ounces}$$

$$2 \text{ quarts} = 4 \text{ pints} = 8 \text{ cups} = 64 \text{ ounces}$$

$$3 \text{ quarts} = 6 \text{ pints} = 12 \text{ cups} = 96 \text{ ounces}$$

- Convert units of measurement when given other equivalent measures represented in a table

Yards	Feet
1	3
2	6
3	9
<i>n</i>	<i>n</i> x 3

Prerequisite:

- The student will determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems
- The student will determine the area of rectangles with whole number side lengths in problems using multiplication related to the number of rows times the number of unit squares in each row

Learning Target:

- The student will solve problems relating to perimeter and area of rectangles where dimensions are whole numbers

5<sup>th</sup> Grade Connections:

- The student will represent and solve problems related to perimeter and/or area and related to volume
- The student will determine the volume of a rectangular prism with whole number side lengths in problems related to the number of layers times the number of unit cubes in the area of the base

- Use the formulas for the perimeter of a rectangle ( $L+W+L+W$  or  $2L+2W$ ) and the formula for area ( $L \times W$ )
- Determine perimeter of a polygon or a missing length when given the perimeter and side lengths
- Determine area of rectangles with whole number side lengths

<p><u>Prerequisite:</u></p> <ul style="list-style-type: none"> <li>The student will determine the solutions to problems involving addition and subtraction of time intervals in minutes using pictorial models or tools</li> </ul> <p><u>Learning Target:</u></p> <ul style="list-style-type: none"> <li>The student is expected to solve problems that involving intervals of time</li> </ul> <p><u>5<sup>th</sup> Grade Connection:</u></p> <ul style="list-style-type: none"> <li>The student will solve problems by calculating conversions within a measurement system, customary or metric (Time)</li> </ul>	<ul style="list-style-type: none"> <li>Identify the difference between quarter after, quarter to, half past</li> <li>Recognize that an hour is 60 minutes and each quarter is 15 minute intervals</li> </ul>
<b>Formative Assessments</b>	<b>Summative Assessments</b>
<b>TEKS: Readiness Standards</b>	<b>TEKS: Supporting Standards</b>
<ul style="list-style-type: none"> <li>Solve problems related to perimeter and area of rectangles where dimensions are whole numbers. <b>4.5D</b></li> <li>Determine the approximate measures of angles in degrees to the nearest whole number using a protractor. <b>4.7C</b></li> <li>Solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate. <b>4.8C</b></li> </ul>	<ul style="list-style-type: none"> <li>Draw an angle with a given measure. <b>4.7D</b></li> <li>Determine the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures. <b>4.7E</b></li> <li>Identify relative sizes of measurement units within the customary and metric systems. <b>4.8A</b></li> <li>Convert measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table. <b>4.8B</b></li> </ul> <p><b>SEs Not Included in Assessed Curriculum:</b></p> <ul style="list-style-type: none"> <li>Use models to determine the formulas for the perimeter of a rectangle (<math>l + w + l + w</math> or <math>2l + 2w</math>), including the special form for perimeter of a square (<math>4s</math>) and the area of a rectangle (<math>l \times w</math>). <b>4.5C</b></li> <li>Illustrate the measure of an angle as the part of a circle whose center is at the vertex of the angle that is "cut out" by the rays of the angle. Angle measures are limited to whole numbers. <b>4.7A</b></li> <li>Illustrate degrees as the units used to measure an angle, where <math>1/360</math> of any circle is one degree and an angle that "cuts" <math>n/360</math> out of any circle whose center is at the angle's vertex has a measure of <math>n</math> degrees. Angle measures are limited to whole numbers. <b>4.7B</b></li> </ul>
<b>TEKS Process Standards</b>	

**See listed in Unit 1	
<ul style="list-style-type: none"> <li><b>Processes and Skills:</b> <b>What students should be able to DO</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Facts:</b> <b>What students should KNOW</b></li> </ul>
<ul style="list-style-type: none"> <li>Convert or change one unit of measurement into another.</li> <li>Choose the accurate estimation and actual amount for the weight/mass of an object. Also determine the appropriate unit of measurement.</li> <li>Choose the accurate estimate and actual amount for capacity of a container. Determine the appropriate unit of measurement. Draw and utilize the Big G.</li> <li>Use the dimensions (and formulas) to determine the area and perimeter of a rectangle.</li> <li>Identify relative sizes of measurement units within the customary and metric system</li> <li>Draw an angle with a given measure</li> <li>Determine the approximate measures of angles in degrees to the nearest whole number</li> </ul>	<ul style="list-style-type: none"> <li>Length can be estimated and measured in different systems using different units</li> <li>Capacity is the measure of the amount of liquid a container can hold</li> <li>The weight of an object is a measure of how heavy an object is</li> <li>Mass is a measure of the quantity of matter in an object</li> <li>Relationships between metric and customary measurement units can be used to covert between metric and customary units of the same attribute by multiplying or dividing</li> <li>Time can be expressed using different units</li> <li>The measure of an angle depends upon the fraction of the circle cutout by its rays</li> <li>Angle measures can be added or subtracted</li> <li>The distance around a figure is it perimeter</li> <li>The amount of space inside a shape is its area, area can be estimated and found using square units</li> <li>There are formulas for the perimeter and the area of a rectangle</li> </ul>
<b>Topics</b>	
Angle Measurement Area Capacity Customary System Length Mass Metric System	Perimeter Temperature Time Unit Conversion Volume Weight
<b>Language of Instruction</b>	
area capacity centimeter century Customary units of measure decade decimeter degree feet	length liter mass Metric units of measure mile millennium milliliter perimeter protractor

fluid ounce gram inches interval kilogram kilometer leap year	tablespoon teaspoon time volume weight yard
<b>State Assessment Connections</b>	<b>National Assessment Connections</b>
<b>STAAR</b>	<b>MAPS</b>
<b>Resources</b>	
Envisions 2.0 Topic 12: Measurement Units and Conversions Topic 13: Solving Measurement Problems Topic 14: Lines, Angles, and Shapes	