

**HPISD CURRICULUM**  
(MATH, GRADE 8)

**EST. NUMBER OF DAYS: 8**

UNIT NAME	<b>IRRATIONAL NUMBERS AND PYTHAGOREAN THEOREM</b>	
<b>Unit Overview</b>	Introduction to irrational numbers, their properties, and applications.	
<b>Generalizations/Enduring Understandings</b>	<ul style="list-style-type: none"> <li>The nature of a mathematical situation and numerical values involved determine the most appropriate numbers used.</li> <li>Operations can be used efficiently and flexibly to solve meaningful problems.</li> <li>Right triangle and similar figure relationships can be used to find unknown measurements without the use of tools.</li> </ul>	
<b>Concepts</b>	<p>Equivalence - Any number, measure, numerical expression, algebraic expression, or equation can be represented in an infinite number that have the same values.</p> <p>Properties - For a given set of numbers there are relationships that are always true, and these are the rules that govern arithmetic and algebra.</p> <p>Pythagorean Theorem and its' Applications - Using the Pythagorean Theorem to find the missing side lengths of a right triangle, to determine whether or not a triangle is a right triangle, and finding the distance between 2 points on a coordinate plane</p>	
<b>Guiding/Essential Questions</b>	<ul style="list-style-type: none"> <li>How do you express a rational number as a whole number, decimal, and approximate value of an irrational number?</li> <li>How can you prove the Pythagorean Theorem and use it to solve problems?</li> <li>How can you test the converse of the Pythagorean Theorem and use it to solve problems?</li> <li>How can you use the Pythagorean Theorem to find the distance between two points on a coordinate plane?</li> </ul>	
	<i>Performance Levels</i>	<i>Learning Progression (** Decision Point)</i>
<b>Learning Targets</b>	LEVEL 4: <u>LEVEL 3:</u> LEVEL 2:	Students will convert and compare numbers using scientific notation as well as approximation of an irrational number.
	LEVEL 4: <u>LEVEL 3:</u> LEVEL 2:	Students will use the Pythagorean Theorem to solve problems for finding the missing side length in a right triangle, use the converse to determine whether or not a triangle is a right triangle, and finding the distance between 2 points on a coordinate plane.
<b>Formative Assessments</b>	<i>Title</i>	
<b>Summative Assessments</b>	<i>Title</i>	
	<i>TEKS</i>	<i>Specifications</i>

<p><b>TEKS (Grade Level) / Specifications</b></p>	<p><b>8.2(B)</b> Approximate the value of an irrational number, including <math>\pi</math> and square roots of numbers less than 225, and locate that rational number approximation on a number line</p> <p><b>8.2(C)</b> Convert between standard decimal notation and scientific notation</p> <p><b>8.6(C)</b> use models and diagrams to explain the Pythagorean theorem</p> <p><b>8.7(D)</b> Determine the distance between two points on a coordinate plane using the Pythagorean Theorem</p> <p><b>8.7(C)</b> Use the Pythagorean Theorem and its converse to solve problems</p> <p><b>8.1(A)</b> apply mathematics to problems arising in everyday life, society, and the workplace</p> <p><b>8.1(B)</b> use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution</p> <p><b>8.1(C)</b> select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems</p> <p><b>8.1(D)</b> communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate</p> <p><b>8.1(E)</b> create and use representations to organize, record, and communicate mathematical ideas</p> <p><b>8.1(F)</b> analyze mathematical relationships to connect and communicate mathematical ideas</p> <p><b>8.1(G)</b> display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication</p>	
<p><b>Processes and Skills</b></p>	<p><b><u>What students should be able to DO</u></b></p> <ul style="list-style-type: none"> <li>• Find and estimate square roots in order to place them on a number line.</li> <li>• Identify the legs and hypotenuse of a right triangle.</li> <li>• Identify a right triangle using the Pythagorean Theorem</li> <li>• Find missing measures in a right triangle using Pythagorean Theorem to solve problems.</li> <li>• Expressing numbers in scientific notation.</li> <li>• Find the distance between two points on a coordinate plane using the Pythagorean Theorem.</li> </ul>	<p><b><u>What students should KNOW</u></b></p> <ul style="list-style-type: none"> <li>• First 15 perfect squares.</li> <li>• Approximations for pi (3, 3.14, 22/7)</li> <li>• Pythagorean Theorem</li> <li>• <math>a \times 10^{nth}</math></li> </ul>
<p><b>Topics</b></p>	<p>Application of Pythagorean Theorem</p> <p>Irrational numbers</p> <p>Pi</p> <p>Scientific notation.</p> <p>Square root approximation</p> <p>Squares and square roots</p>	
<p><b>Language of Instruction</b></p>	<p>base</p> <p>exponent</p> <p>hypotenuse</p>	

	legs Pi power/exponent Pythagorean Theorem scientific notation square square root
<b>State Assessment Connections</b>	
<b>National Assessment Connections</b>	
<b>Resources</b>	