



Marietta City Schools  
2023–2024 District Unit Planner

Accelerated Grade 7/8 Mathematics

<b>Unit title</b>	Unit 8: Exploring Geometric Relationships	<b>MYP year</b>	3	<b>Unit duration (hrs)</b>	3 weeks
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Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

GA DOE Standards

**Standards**

**8.GSR.8** Solve geometric problems involving the Pythagorean Theorem and the volume of geometric figures to explain real-life phenomena.

**8.MP:** Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals.

**Gifted Standards**

**Strand 2: Creative Thinking Skills**

Students will develop and utilize creative thinking through a variety of products and problem solving.

**Strand 3: Higher Order Thinking and Problem Solving Skills**

Students will develop and utilize critical thinking, higher order thinking, logical thinking and problem solving skills in various situations.

**Strand 4: Advanced Communication and Collaboration Skills**

Students will develop advanced communication and collaboration skills in working toward a common goal with shared accountability for the final outcome.



**Concepts/Skills to support mastery of standards**

8.GSR.8.1 - Explain a proof of the Pythagorean Theorem and its Converse

8.GSR.8.2 - Apply the Pythagorean Theorem to determine the unknown side lengths in right triangles.

8.GSR.8.3 - Apply the Pythagorean Theorem to find the distance between two points.

8.GSR.8.4 - Apply the formulas for the volume of Cylinders, Cones, and Spheres.

8.GSR.8.1	Explain a proof of the Pythagorean Theorem and its converse using visual models.	<b>Age/Developmentally Appropriate</b> <ul style="list-style-type: none"> <li>Students are not limited to a particular proof for the Pythagorean Theorem or its converse.</li> </ul>	<b>Strategies and Methods</b> <ul style="list-style-type: none"> <li>Geometric and spatial reasoning should be used when explaining the Pythagorean Theorem.</li> </ul>	<b>Example</b> 
8.GSR.8.2	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles within authentic, mathematical problems in two and three dimensions.	<b>Age/Developmentally Appropriate</b> <ul style="list-style-type: none"> <li>Triangle dimensions may be rational or irrational numbers.</li> </ul>	<b>Strategies and Methods</b> <ul style="list-style-type: none"> <li>Geometric and spatial reasoning should be used to solve problems involving the Pythagorean theorem.</li> <li>Models and drawings may be useful as students solve contextual problems in two- and three-dimensions.</li> </ul>	<b>Example</b>  <p>How tall is the Great Pyramid of Giza?</p>

				<p>To answer this question, students may use what they learned in 6<sup>th</sup> grade to find the distance between <math>(-12, 9)</math> and <math>(-12, -2)</math> representing A street and the distance between <math>(-12, -2)</math> and <math>(16, -2)</math> representing B street. Then, students could use those two distances to find the sum of the distances for the first path. Then, students can apply the Pythagorean theorem to determine the distance between the final two points, <math>(-12, 9)</math> and <math>(16, -2)</math> to determine the answer to the question.</p>
8.GSR.8.4	Apply the formulas for the volume of cones, cylinders, and spheres and use them to solve in relevant problems.	<p><b>Age/Developmentally Appropriate</b></p> <ul style="list-style-type: none"> <li>This learning objective is limited to right circular cones, right cylinders, and spheres.</li> </ul>	<p><b>Strategies and Methods</b></p> <ul style="list-style-type: none"> <li>Given the volume, solve for an unknown dimension of the figure. Students will need to be able to express the answer in terms of pi and as a decimal approximation.</li> <li>Students should be able to use their knowledge of cube roots to solve for unknown dimensions of geometric figures.</li> </ul>	<p><b>Relevance and Application</b></p> <ul style="list-style-type: none"> <li>Students should be given opportunities to find missing dimensions of a right circular cone (e.g., slant height, radius, etc.).</li> <li>Students should be able to make connections between the Pythagorean Theorem and solving relevant problems related to volume of cones.</li> </ul>

**8.MP:** Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals

**Concepts/Skills to support mastery of standards**

- 8.GSR.8.1 - Explain a proof of the Pythagorean Theorem and its converse using visual models
- 8.GSR.8.2 - Apply the Pythagorean Theorem to determine unknown side lengths in right triangles
- 8.GSR.8.3 - Apply the Pythagorean Theorem to find the distance between two points in a coordinate system
- 8.GSR.8.4 - Apply formulas for the volume of a cylinder, cone, and sphere

**Vocabulary**

<u>Altitude of a Triangle</u>	<u>Base (of a Polygon)</u>	<u>Coordinate Plane</u>	<u>Coordinate Point of a Plane</u>	<u>Converse of Pythagorean Theorem</u>	<u>Cube Root</u>
<u>Hypotenuse</u>	<u>Leg of a Triangle</u>	<u>Perfect Squares</u>	<u>Perfect Cubes</u>	<u>Pythagorean Theorem</u>	<u>Pythagorean Triples</u>
<u>Square Root</u>					

**Notation**

Key concept	Related concept(s)	Global context
Relationships	Measurement, Space	Orientation in space and time

**Statement of inquiry**

People can explore relationships through measurement

**Inquiry questions**

- **Factual**— What is the Pythagorean Theorem?
- **Conceptual**— How has the discovery of the Pythagorean Theorem shaped the world in which we live? What does it mean to cube or square a number? Why is the square root of 2 irrational?
- **Debatable**— Can the Pythagorean Theorem be applied to any polygon? Explain

MYP Objectives	Assessment Tasks	
What specific MYP <b>objectives</b> will be addressed during this unit?	<b>Relationship</b> between summative assessment task(s) and statement of inquiry:	List of common formative and summative assessments.

<p>Criterion A: Knowledge and Understanding</p>	<p>Students will explore relationships through measurement.</p>	<p><b><u>Formative Assessment(s):</u></b> Unit 6 CFA</p> <p><b><u>Summative Assessment(s):</u></b> Unit 6: Geometric Applications of Exponents MYP: MTM Pythagorean Theorem Performance Task</p>
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**Approaches to learning (ATL)**

<p><b>Category:</b> Social <b>Cluster:</b> Collaboration Skills <b>Skill Indicator:</b> Give and receive meaningful feedback.</p> <p><b>Category:</b> Thinking <b>Cluster:</b> Creative Thinking Skills <b>Skill Indicator:</b> Draw reasonable conclusions and generalizations.</p>
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**Learning Experiences**

Add additional rows below as needed.

Objective or Content	Learning Experiences	Personalized Learning and Differentiation
<p><b><u>8.GSR.8.2</u></b> Apply the Pythagorean Theorem to determine unknown side lengths in right triangles with authentic, mathematical problems in two and three dimensions.</p>	<p><b>Using the Pythagorean Theorem</b> <a href="#">Teacher Guidance</a> <a href="#">Student Reproduceables</a> <a href="#">Blackline Masters through Desmos</a></p> <p><b>Learning Goal:</b></p> <ul style="list-style-type: none"><li>● I can use right triangles to model real world problems.</li><li>● I can use the Pythagorean Theorem to find the distance between points. ● I can explain how the components (a, b, and c) of the Pythagorean Theorem relate to a contextual situation.</li><li>● I can interpret the solution to a situation involving the Pythagorean Theorem.</li></ul>	<p>In this learning plan, students will apply the Pythagorean Theorem to determine the packaging needs for two television companies. Students will only solve equations involving square roots as it relates to the Pythagorean Theorem. Students will also rationalize the denominator.</p>
<p><b><u>8.GSR.8:</u></b> Solve geometric problems involving the Pythagorean Theorem and the volume of geometric figures to explain real-life phenomena.</p> <p><b><u>8.GSR.8.2</u></b> Apply the Pythagorean Theorem to determine unknown side lengths in right triangles within authentic mathematical problems in two and three dimensions.</p>	<p><b>Calculate the Volume of Glasses</b> <a href="#">Teacher Guidance</a> <a href="#">Student Reproduceables</a></p> <p><b>Learning Goal:</b></p> <ul style="list-style-type: none"><li>● I can use geometric and spatial reasoning to solve problems involving the Pythagorean Theorem.</li><li>● I can use models and drawings to help solve contextual problems in two- and three dimensions.</li><li>● I can compose and decompose shapes to find the volume of a compound object.</li></ul>	<p>In this learning plan, students will solve real-world problems involving the volume of compound objects including right cylinders, right circular cones, and spheres. Students will explore the formulas for the shapes, use the Pythagorean Theorem, and use the volume formulas to determine the volume of three glasses.</p>

**8.GSR.8.4**

Apply the formulas for the volume of cones, cylinders, and spheres and use them to solve relevant, real-life problems.

**Content Resources**

[Grade-8-Mathematics-Unit-6-Exploring-Geometric-Relationships](#)

[Savvas Correlation Link](#)