



## Year Long Course Plan

**Department: Mathematics**

**Course: Accelerated Geometry 424/425**

**Essential Learning Outcomes:** After successfully completing this course, students will be able to:

1. Identify, describe, and analyze properties of figures, relationships among figures, and relationships among their parts
2. Use geometric models to solve mathematical and real-world problems
3. Present convincing arguments by means of demonstration, informal proof, counter-examples, or any other logical means to show the truth of statements and generalizations
4. Use the two-dimensional rectangular coordinate system and algebraic procedures to describe and characterize geometric properties and relationships
5. Organize work and present mathematical procedures and results clearly, systematically, succinctly, and correctly
6. Use reason and logic to evaluate information, perceive patterns, identify relationships, formulate questions, pose problems, and make and test conjectures
7. Communicate logical arguments
8. Analyze non-routine problems and arrive at solutions by various means
9. Develop effective oral and written presentations employing correct mathematical terminology, notation, symbols, and conventions for mathematical arguments and display of data
10. Determine measurements directly using geometric tools, formulas, and applications of geometric properties

| <i>Quarter 1</i>   | <i>Quarter 2</i>  |
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| <p><b>Unit 1: Introducing Geometry</b><br/>(ELO 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)</p> <ul style="list-style-type: none"> <li>• Basic Geometric Terms</li> <li>• Defining and Classifying Angles</li> <li>• Defining and Classifying Polygons</li> <li>• Defining and Classifying Triangles</li> <li>• Defining and Classifying Quadrilaterals</li> <li>• Defining and Identifying Parts of a Circle</li> <li>• Visualizing Objects in Two and Three Dimensions</li> <li>• Translating Written Problems into Labeled Drawings</li> <li>• ASSESSMENT: Written Test</li> </ul> <p><b>Unit 2: Reasoning in Geometry</b><br/>(ELO 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)</p> <ul style="list-style-type: none"> <li>• Inductive Reasoning</li> <li>• Finding the Pattern of a Sequence</li> <li>• Using Mathematical Modeling to Solve Problems</li> <li>• Deductive Reasoning</li> <li>• Discovering Angle Relationships</li> <li>• Exploring Relationships of Angles Formed by a Transversal Cutting Parallel Lines</li> <li>• ASSESSMENT: Written Test</li> </ul> | <p><b>Unit 3: Using Tools of Geometry</b><br/>(ELO 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)</p> <ul style="list-style-type: none"> <li>• Duplicating Segments and Angles</li> <li>• Constructing Perpendicular Bisectors</li> <li>• Constructing Perpendiculars to a Line</li> <li>• Constructing Angle Bisectors</li> <li>• Construction Parallel Lines</li> <li>• Using Slopes of Parallel and Perpendicular Lines</li> <li>• Constructing Points of Concurrency</li> <li>• ASSESSMENT: Written Test</li> </ul> <p><b>Unit 4: Discovering and Proving Triangle Properties</b><br/>(ELO 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)</p> <ul style="list-style-type: none"> <li>• Discovering the Triangle Sum Conjecture</li> <li>• Properties of Isosceles Triangles</li> <li>• Triangle Inequalities</li> <li>• Congruence Shortcuts</li> <li>• Using Corresponding Parts of Congruent Triangles</li> <li>• ASSESSMENT: Written Test</li> </ul> <p><b>Unit 5: Discovering and Proving Polygon Properties</b><br/>(ELO 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)</p> <ul style="list-style-type: none"> <li>• Polygon Sum Conjecture</li> <li>• Exterior Angles of a Polygon</li> <li>• Kite and Trapezoid Properties</li> <li>• Properties of Midsegments</li> <li>• Properties of Parallelograms</li> </ul> |

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|   | <ul style="list-style-type: none"> <li>• Proving Properties of Quadrilaterals</li> <li>• ASSESSMENT: Written Test</li> </ul>   |
| <b>Quarter 3</b>  | <b>Quarter 4</b>   |
| <p><b>Unit 6: Discovering and Proving Circle Properties (ELO 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)</b></p> <ul style="list-style-type: none"> <li>• Tangent Properties</li> <li>• Chord Properties</li> <li>• Inscribed Angles and Their Intercepted Arcs</li> <li>• Circumference</li> <li>• Arc Length</li> <li>• ASSESSMENT: Written Test</li> </ul> <p><b>Unit 8: Area (ELO 1, 2, 3, 5, 6, 7, 8, 9, 10)</b></p> <ul style="list-style-type: none"> <li>• Areas of Rectangles and Parallelograms</li> <li>• Areas of Triangles, Trapezoids, Kites</li> <li>• Areas of Regular Polygons</li> <li>• Areas of Circles</li> <li>• Areas of Segments, Sectors, Annuluses</li> <li>• Surface Area of Solids</li> <li>• ASSESSMENT: Written Test</li> </ul> <p><b>Unit 9/12: Right Triangles and Trigonometry (ELO 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)</b></p> <ul style="list-style-type: none"> <li>• The Pythagorean Theorem</li> <li>• Special Right Triangles</li> <li>• Distance in Coordinate Geometry</li> <li>• Applying the Theorem to Circles</li> <li>• Trigonometry</li> <li>• ASSESSMENT: Written Test</li> </ul> | <p><b>Unit 7: Transformations and Tessellations (ELO 1, 2, 3, 5, 6, 7, 8, 9, 10)</b></p> <ul style="list-style-type: none"> <li>• Translations, Reflections, and Rotations</li> <li>• Properties of Isometries</li> <li>• Compositions of Transformations</li> <li>• Tessellations with Regular Polygons</li> <li>• Tessellations Using Translations and Rotations</li> <li>• ASSESSMENT: Escher Art Project</li> </ul> <p><b>Unit 10: Volume (ELO 1, 2, 3, 5, 6, 7, 8, 9, 10)</b></p> <ul style="list-style-type: none"> <li>• Vocabulary of 3 Dimensional Figures</li> <li>• Volume of Prisms and Cylinders</li> <li>• Volume of Pyramids and Cones</li> <li>• Displacement and Density</li> <li>• Volume of a Sphere</li> <li>• Surface Area of a Sphere</li> <li>• ASSESSMENT: Written Test and the Measurement of Foam Blocks Project</li> </ul> <p><b>Unit 11: Similarity (ELO 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)</b></p> <ul style="list-style-type: none"> <li>• Similar Polygons</li> <li>• Similar Triangles</li> <li>• Indirect Measurement with Similar Triangles</li> <li>• Corresponding Parts of Similar Triangles</li> <li>• Proportions with Area</li> <li>• Proportions with Volume</li> <li>• Proportional Segments Between Parallel Lines</li> <li>• ASSESSMENT: Written Test and “The Shadow Knows” Indirect Measurement Project</li> </ul> |

