Marietta City Schools

2024–2025 District Unit Planner

Algebra: Concepts & Connections

Unit title	Unit 8: Algebraic Connections to Geometric Concepts	**MYP year**	4	**Unit duration (hrs)**	*12 hours*

Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): ***What will students learn?***

GA DoE Standards

Standards

A.GSR.3: Solve problems involving distance, midpoint, slope, area, and perimeter to model and explain real-life phenomena.

A.GSR.3.1 Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

Fundamentals

- Students should apply their understanding of linear relationships to solve real-life, application problems related to slope, parallel lines, perpendicular lines, area, and perimeter.
- Students should be able to calculate the area and perimeter of special parallelograms and triangles with simple, unknown side lengths.

A.GSR.3.2 Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.

Fundamentals

- Students should be able to apply their understanding of slope and use the distance and midpoint formulas to solve real-world problems.
- In a real-life application, using a figure in the coordinate plane, students should be able to find a location using distance or midpoint.

Example

- Find the distance of a line segment plotted on the coordinate plane.

A.MM.1: Apply mathematics to real-life situations; model real-life phenomena using mathematics

A.MM.1.1 Explain applicable, mathematical problems using a mathematical model.

Fundamentals

- Students should be provided with opportunities to learn mathematics in the framework of real-life problems.
- Mathematically applicable problems are those presented in which the given framework makes sense, realistically and mathematically, and allows for students to make decisions about how to solve the problem (model with mathematics).

A.MM.1.3 Use units of measure (linear, area, capacity, rates, and time) as a way to make sense of conceptual problems; identify, use, and record appropriate units of measure within the given framework, within data displays, and on graphs; convert units and rates using proportional reasoning given a conversion factor; use units within multi-step problems and formulas; interpret units of input and resulting units of output.

Strategies and Methods

- Dimensional analysis may be used when converting units and rates.

Examples

- Units of measure may include linear, area, capacity, rates, and time.

A.MM.1.4 Use various mathematical representations and structures with this information to represent and solve real-life problems.

Strategies and Methods Vocabulary

Area	Coordinates	Distance	Distance Formula	Intersection	Line Segment
Midpoint	Parallel	Perimeter	Perpendicular	Phenomena	Proof
Reciprocal	Slope	Slope Relationships	Theorem	Vertices	

- Students should be able to fluently navigate between mathematical representations that are presented numerically, algebraically, and graphically.
- For graphical representations, students should be given opportunities to analyze graphs using interactive graphing technologies.

A.MM.1.5 Define appropriate quantities for the purpose of descriptive modeling.

Fundamentals

- Given a situation, framework, or problem, students should be able to determine, identify, and use appropriate quantities for representing the situation.

Concepts/Skills to support mastery of standards

• Approximating radicals • Calculating slopes of lines • Graphing lines • Writing equations for lines • Number sense • Computation with whole numbers and decimals, including application of order of operations • Addition and subtraction of common fractions with like denominators • Applications of the Pythagorean Theorem • Graphing on a coordinate plane • Operations with radicals

Notation

Key concept	Related concept(s)	Global context
Form The shape and underlying structure of an entity or piece of work, including its organization, essential nature and external appearance.	Measurement, Models	Personal and Cultural Expression: Artistry, craft, creation, beauty

Statement of inquiry
Generalizing relationships between models can develop principles, processes and solutions through their various measurements.

Inquiry questions
Factual— ● What is a parallel line?

- What is a perpendicular line?
- What is the formula for the area of a triangle?
- What is the formula for the area of a rectangle?

Conceptual—

- What is the difference in slopes for parallel and perpendicular lines?
- Explain the difference between area and perimeter.

Debatable-

- Can the area and the perimeter of an object be the same?

MYP Objectives	**Assessment Tasks**	
*What specific MYP **objectives** will be addressed during this unit?*	***Relationship** between summative assessment task(s) and statement of inquiry:*	*List of common formative and summative assessments.*
MYP D - City Design	The task allows students the opportunity to model a city and utilize formulas for measurement.	**Formative Assessment(s):** Mid Unit Check **Summative Assessment(s):** MYP D - City Design

Approaches to learning (ATL)

Category: Thinking Skills
Cluster: Creative-Thinking
Skill Indicator: Apply existing knowledge to generate new ideas, products or process
Learning Experience: City Design

Learning Experiences

Add additional rows below as needed.

Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**

A.GSR.3.1: Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.	**<u>City Design</u>** **Description:** In this learning plan, students will engage in a guided discovery activity to apply the relationship between the slopes of parallel lines and the slopes of perpendicular lines. Through this task, students will verify geometric relationships in the coordinate plane using algebraic thinking. They will focus on applying slopes of parallel and perpendicular lines in creating a design for a city. Students will deepen their understanding of the connections between slopes, parallel lines, and perpendicular lines in the coordinate plane while building on their skills for determining area and perimeter of shapes on a coordinate grid. **Learning Goals:** ● I can show that the slopes of parallel lines are the same. ● I can show that the slopes of perpendicular lines are opposite reciprocals. ● I can find the equation of the line that passes through the point and is parallel/perpendicular to the given line.	Language Supports: The teacher can provide a list of the various ways to find slope with a sample problem as well as visuals to review parallel lines, perpendicular lines, or neither Extending the Learning: Ask students to create their own scenario like those used in the diagnostic. Students can be creative with the story line and should be asked to create their own data based on their scenario to present to the class. Supporting the Learning: Students often struggle with the accuracy and presentation of their graphs; therefore, the teacher may want to consider allowing students to use Desmos.com to complete this activity.
Content Resources		
Textbook Correlation: enVision A|G|A - Algebra 1 **A.GSR.3.1** - Lesson 2-4, Geometry Lesson 2-4, 9-1 **A.GSR.3.2** - Geometry Lesson 1-3, 2-4		