Marietta City Schools

2023–2024 District Unit Planner

		Enhanced Algebra: Concepts & Connections (Grade 8)			
Unit title	*Unit 2: Analyzing Systems of Linear Equations and Inequalities*	**MYP year**	*3*	**Unit duration (hrs)**	*Enter Hours* *20 hours* *MMS- (4.5 hours per week)*

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

GA DoE Standards

Standards

8.FGR.7: Justify and use various strategies to solve systems of linear equations to model and explain realistic phenomena.

   8.FGR.7.1 Interpret and solve relevant mathematical problems leading to two linear equations in two variables.

   8.FGR.7.2 Show and explain that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because the points of intersection satisfy both equations simultaneously.

   8.FGR.7.3 Approximate solutions of two linear equations in two variables by graphing the equations and solving simple cases by inspection.

   8.FGR.7.4 Analyze and solve systems of two linear equations in two variables algebraically to find exact solutions.

   8.FGR.7.5 Create and compare the equations of two lines that are either parallel to each other, perpendicular to each other, or neither parallel nor perpendicular.

 A.PAR.4: Create, analyze, and solve linear inequalities in two variables and systems of linear inequalities to model real-life phenomena.

   A.PAR.4.1: Create and solve linear inequalities in two variables to represent relationships between quantities including mathematically applicable situations; graph inequalities on coordinate axes with labels and scales.

   A.PAR.4.2: Represent constraints of linear inequalities and interpret data points as possible or not possible.

   A.PAR.4.3: Solve systems of linear inequalities by graphing, including systems representing a mathematically applicable situation.

 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.1.2 Create mathematical models to explain phenomena that exist in the natural sciences, social sciences, liberal arts, fine and performing arts, and/or humanities domains.

     Fundamentals

• Students should be able to use the content learned in this course to create a mathematical model to explain real-life phenomena.

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

Strategies and Methods

• 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.

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.FGR.7.1 Interpret and solve relevant mathematical problems leading to two linear equations in two variables.

8.FGR.7.2 Show and explain that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because the points of intersection satisfy both equations simultaneously.

8.FGR.7.3 Approximate solutions of two linear equations in two variables by graphing the equations and solving simple cases by inspection.

8.FGR.7.4 Analyze and solve systems of two linear equations in two variables algebraically to find exact solutions.

8.FGR.7.5 Create and compare the equations of two lines that are either parallel to each other, perpendicular to each other, or neither parallel nor perpendicular.

A.PAR.4.1: Create and solve linear inequalities in two variables to represent relationships between quantities including mathematically applicable situations; graph inequalities on coordinate axes with labels and scales.

A.PAR.4.2: Represent constraints of linear inequalities and interpret data points as possible or not possible.

A.PAR.4.3: Solve systems of linear inequalities by graphing, including systems representing a mathematically applicable situation.

MCS.Gifted.S2 Students will develop and utilize creative thinking through a variety of products and problem solving.

Vocabulary

K-12 Mathematics Glossary

Systems of Equations	One Solution	No Solution	Parallel Lines	Perpendicular Lines	Skewed Lines	Infinitely Many Solutions
Systems of Inequalities	Functions	Inequalities	define	evaluate	rational	irrational
boundary line	consistent system	elimination method	inconsistent system	infinite solutions	linear function	slope of parallel lines
slope of perpendicular lines	simultaneous equations	solution to a system of equations	solution set to a system of inequalities	substitution method	x–intercept	y– intercept

Notation

Key concept	Related concept(s)	Global context
Logic, Form	Justification, System, Change, Generalization, Pattern, Representation	Scientific and Technical Innovation

Statement of inquiry
Students will analyze a system of equations and inequalities to help make logical decisions by way of evaluating and interpreting relationship changes that cause generalizations and patterns.

Inquiry questions

Factual— What is the method for solving a system of equations? What is a solution to a system? How do equations and expressions differ? How do you evaluate an expression? What is a solution?

Conceptual— How can the results of systems of equations be interpreted? How can a formula be rearranged?   Why is rearranging a formula helpful?   How do you solve equations using algebraic properties of equality? What are the similarities and differences between the equations and inequalities?

Debatable- What would be the best way to solve a system of equations? What is the best way to solve a linear equation in a one-variable equation? What is the best way to solve a linear system of equations?

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.*
Objective A: Knowing and Understanding Objective B: Investigating Patterns Objective C: Communicating Objective D: Applying Mathematics in Real-Life Contexts	Students can analyze systems of equations in order to make logical decisions.	**Formative Assessment(s):** Mid Unit Check Unit 2 CFA **MYP Assessments: MYP A** – Solution to a System of Inequalities in One Variable **Summative Assessment(s):** **Unit 2 Summative** **MYP A, B, D:** Solving Linear Equations in Two Variables
Approaches to learning (ATL)				
Category: Thinking and Communication **Cluster:** Collaboration, critical thinking, creative thinking **Skill Indicator:** Interpret Data, apply existing knowledge and to generate new ideas, products, and process		● Give and Receive Meaningful Feedback ● Manage and Resolve conflict and work collaboratively in teams		

Learning Experiences		
Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**

A.MM.1 – Apply mathematics to real-life situations; model real-life phenomena using mathematics
 	
• A.MM.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.1.2 – Create mathematical models to explain phenomena that exist in the natural sciences, social sciences, liberal arts, fine and performing arts, and/or humanities domains.
    Fundamentals
    • Students should be able to use the content learned in this course to create a mathematical model to explain real-life phenomena.
 	
• A.MM.1.4 – Use various mathematical representations and structures with this information to represent and solve
	Graphing Solutions to Systems of Linear Equations
	
	https://lor2.gadoe.org/gadoe/file/b0f18dcc-2d13-4974-b49f-f2cb834e3b1e/1/Graphing-Solutions-to-Systems-of-Linear-Equations-Student-Reproducibles.pdf
	(Student Document)
	
	https://lor2.gadoe.org/gadoe/file/b0f18dcc-2d13-4974-b49f-f2cb834e3b1e/1/Graphing-Solutions-to-Systems-of-Linear-Equations.pdf
	(Teacher's Document)
		Learning Plan Description: In this learning plan, students will be formally introduced to the concept of systems of equations. The previous activities have allowed students to explore systems informally.
		Here, students will build upon earlier work with linear equations in two variables in two types of contexts: contexts like distance versus time, where there is an initial value and a rate of change, and contexts like budgets, where there is an equation constraining the possible combinations of two quantities.
		 In this lesson, students consider pairs of linear equations in each type of context and interpret the meaning of points on the graphs of the equations.
		
		Students will receive direct explicit instructions
		Small Group and intentional grouping will be used each day to cater to the needs of students
		Students will show understanding of concepts through Formative and Summative Assessments.

real-life problems.
    Strategies and Methods
    • 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.
 	
8.FGR.7 – Justify and use various strategies to solve systems of linear equations to model and explain realistic phenomena.
 	
• 8.FGR.7.1 – Interpret and solve relevant mathematical problems leading to two linear equations in two variables.
 	
• 8.FGR.7.2 – Show and explain that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because the points of intersection satisfy both equations simultaneously.
 	
• 8.FGR.7.3 – Approximate solutions of two linear equations in two variables by graphing the equations and solving simple cases by inspection.
 	
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.		

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.1.4 — Use various mathematical representations and structures with this information to represent and solve real-life problems.
    Strategies and Methods
    • 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.PAR.4 — Create, analyze, and solve linear inequalities in two variables and
	Graphing Linear Inequalities in Two Variables Part 1
	
	https://lor2.gadoe.org/gadoe/file/1c288bf9-11ca-43dd-84e6-b746c91b337d/1/Graphing-Linear-Inequalities-in-Two-Variables-Part-1-Student-Reproducibles.pdf
	(Student Document)
	
	https://lor2.gadoe.org/gadoe/file/1c288bf9-11ca-43dd-84e6-b746c91b337d/1/Graphing-Linear-Inequalities-in-Two-Variables-Part-1.pdf
	(Teacher's Document)
		Learning Plan Description: In this learning plan, students will learn that a solution to a linear inequality in two variables could involve not only points on a line but also points of a region bounded by a line. Students will begin by observing solutions and nonsolutions of an inequality occupy different regions of a coordinate plane and discover that the inequality represents a half-plane. Students will then write inequalities and discover the linear equations that divide those regions.
		
		Students will receive direct explicit instructions
		Small Group and intentional grouping will be used each day to cater to the needs of students
		Students will show understanding of concepts through Formative and Summative Assessments.

systems of linear inequalities to model real-life phenomena. • A.PAR.4.1 – Create and solve linear inequalities in two variables to represent relationships between quantities including mathematically applicable situations; graph inequalities on coordinate axes with labels and scales. • A.PAR.4.2 – Represent constraints of linear inequalities and interpret data points as possible or not possible. A.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.		

Content Resources	

Textbook Correlation: enVision A|G|A - Algebra 1, enVision Math 2.0 Volume 1

GADOE - Aligned Learning Lessons

A.PAR.4.1- **SAVVAS Topic 2**	**8.FRG.7.1 - SAVVAS Topic 4.1**	
A.PAR.4.2 - **SAVVAS Topic 2**	**8.FRG.7.2 - SAVVAS Topic 4.2**	
A.PAR.4.3 - SAVVAS Topic 4	**8.FRG.7.3- SAVVAS Topic 4.2**	
	8.FRG.7.4 - SAVVAS Topic 4.3	
	8.FRG.7.5 - SAVVAS Topic 4.3	