Marietta City Schools

2025-2026 District Unit Planner

Enhanced Algebra: Concepts & Connections (Grade 8)

Unit title	*Unit 1: Modeling Linear Relationships & Functions*	**MYP year**	*3*	**Unit duration (hrs)**	*13.5 Hours*

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

GA DoE Standards	
Standards **8.PAR.3:** Create and interpret expressions within relevant situations. Create, interpret, and solve linear equations and linear inequalities in one variable to model and explain real phenomena. **8.PAR.4** Show and explain the connections between proportional and non-proportional relationships, lines, and linear equations; create and interpret graphical, mathematical models and use the graphical, mathematical model to explain real-life phenomena represented in the graph. **8.FGR.5** Describe the properties of functions to define, evaluate, and compare relationships, and use functions and graphs of functions to model and explain real-life phenomena. **A.FGR.2:** Construct and interpret arithmetic sequences as functions, algebraically and graphically, to model and explain real-life phenomena. Use formal notation to represent linear functions and the key characteristics of graphs of linear functions, and informally compare linear and nonlinear functions using parent graphs. **Gifted Standards** **Gifted 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. **GA Mathematical Practices** **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.1.2 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.

Concepts/Skills to support mastery of standards

8.PAR.3.1 Interpret and utilize formulas or expressions.
8.PAR.3.2 Describe and solve linear equations in order to demonstrate a simpler form of equivalent equations.
8.PAR.3.3 Create and solve linear equations and inequalities for application.
8.PAR.3.4 Applying algebraic properties in order to justify steps for one-solution equations and inequalities.
8.PAR.3.5 Solve linear equations and inequalities in one variable, and explain the contextual meaning in a scenario.
8.PAR.3.6 Apply algebraic reasoning in various forms to solve linear and literal equations.

8.PAR.4.1 Use the equation y = mx (proportional) for a line through the origin to derive the equation y = mx + b (non-proportional) for a line intersecting the vertical axis at b.

8.PAR.4.2 Show and explain that the graph of an equation representing an applicable situation in two variables is the set of all its solutions plotted in the coordinate plane.

8.FGR.5.1 Show and explain that a function is a rule that assigns to each input exactly one output.

8.FGR.5.2 Within realistic situations, identify and describe examples of functions that are linear or nonlinear. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

8.FGR.5.3 Relate the domain of a linear function to its graph and where applicable to the quantitative relationship it describes.

8.FGR.5.4 Compare properties (rate of change and initial value) of two functions used to model an authentic situation each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

8.FGR.5.5 Write and explain the equations y = mx + b (slope-intercept form), Ax + By = C (standard form), and (y - y1) = m(x-x1) (point-slope form) as defining a linear function whose graph is a straight line to reveal and explain different properties of the function.

8.FGR.5.6 Write a linear function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

8.FGR.5.7 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values, including reading these from a table or from a graph.

8.FGR.5.8 Explain the meaning of the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

8.FGR.5.9 Graph and analyze linear functions expressed in various algebraic forms and show key

A.FGR.2.1 Use mathematically applicable situations algebraically and graphically to build and interpret arithmetic sequences as functions whose domain is a subset of the integers
A.FGR.2.2 Construct and interpret the graph of a linear function that models real-life phenomena and represent key characteristics of the graph using formal notation.
A.FGR.2.3 Relate the domain and range of a linear function to its graph and, where applicable, to the quantitative relationship it describes. Use formal interval and set notation to describe the domain and range of linear functions.
A.FGR.2.4 Use function notation to build and evaluate linear functions for inputs in their domains and interpret statements that use function notation in terms of a mathematical framework.
A.FGR.2.5 Analyze the difference between linear functions and nonlinear functions by informally analyzing the graphs of various parent functions (linear, quadratic, exponential, absolute value, square root, and cube root parent curves).
MCS.Gifted.S3B - Students will develop and utilize critical thinking, higher order thinking, logical thinking and problem solving skills in various situations

Key Learning Targets for standards mastery

Students will construct and interpret arithmetic sequences as functions, both algebraically and graphically.

Students will need to maintain their ability to interpret linear functions, including key characteristics using proper notation.

Students should be able to compare linear and nonlinear functions informally.

Vocabulary

K-12 Mathematics Glossary

Terms	Factors	Coefficient	Constant	Variable	Operation
Inverse	Solutions	One Solution	No Solution	Infinitely Many Solutions	Expression
Equations	Inequalities	Like Terms	Literal Equations	Linear Function	Non-Linear Function
Relation	Rate of Change/ Slope	Parent Functions	Function Notation	Continuous	Discrete

Range	Domain	Dependent VAriable	Independent Variable	Set Notation	Set Notation
Time Graphs	Intercepts	Interval Notation			

Notation

y = mx

y = mx + b

Ax + By = C

$y - y_1 = m (x - x_1)$

Function Notation -

$f(t)$ Interval Notation - [.] , (,) Set Notation - D: $\{x|x \in R\}$ (Set of all real numbers) , R: $\{y \mid y \in R\}$, $\{x|5 \leq x \leq 7\}$

Key concept		Related concept(s)	Global context
Form		Change, Model, Pattern	Identities and Relationships

Statement of inquiry

Students will interpret real life scenarios to enhance their understanding of patterns.

Inquiry questions

Factual— What is the best method to use to create, interpret, and solve a linear relationship in the real world? How do you interpret mathematical models in linear equations and linear inequalities? Describe the properties of linear and nonlinear functions? How are arithmetic sequences related to linear functions? How do you construct, interpret, and analyze key characteristics in set notation?

Conceptual— How do we use arithmetic sequences as functions to model and explain real-life phenomena? How do we identify characteristics of linear functions in context?

Debatable- What is the best representation of a function? Can a linear model always accurately represent real-life data? Which representation—equation, table, or graph—is most helpful in real-life scenarios?

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 A - Knowing and Understanding MYP B - Identifying and Predicting Patterns MYP C - Communicating using academic vocabulary MYP D - Creating and modeling linear equations and functions to address real world problems	Students will interpret real life scenarios to enhance their understanding of patterns.	**Formative Assessment(s):** Unit 1 CFA **Summative Assessment(s):** Unit 1 Summative Assessment Unit 1 Retake/Retest MYP Assessment: Catering Project (A,B,CD)	
Approaches to learning (ATL)			
Category: Communication Skills **Cluster:** Communication **Skill Indicator:** Understand and use mathematical notation	**Category:** Thinking Skills **Cluster:** Critical-thinking **Skill Indicator:** Gather and organize relevant information to formulate an argument.		

Design Cycle Transdisciplinary	
• Inquiring and Analyzing • Developing Ideas • Creating a Solution • Evaluating	

Learning Experiences Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
• A.MM.1.1 – Explain applicable, mathematical problems using a mathematical model. • 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 • A.MM.1.4 – Use various mathematical representations and structures with this information to represent and solve real-life problems. 8.FGR.5 Describe the properties of functions to define, evaluate, and compare relationships,and use functions and graphs of functions to model and explain real life phenomena. • 8.FGR.5.4 Compare properties (rate of change and initial value) of two functions used to model an authentic situation each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). • 8.FGR.5.7 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of the relationship or from two (x,y) values,	**Table for 63, Please!** https://lor2.gadoe.org/gadoe/file/f969597d-bf7a-4fff-ac04-d98513f22dae/1/Table-for-63-Please-Student-Recording-Sheets.pdf **(Student Document)** https://lor2.gadoe.org/gadoe/file/f969597d-bf7a-4fff-ac04-d98513f22dae/1/Table-for-63-Please-Learning-Plan.pdf **(Teacher's Document)** **Learning Plan Description:** In this learning plan, students will create and use an equation to describe a function within the context of a real-life situation. Students will begin to compare linear function examples within the same scenario. **Learning Goals:** 1. I can create linear functions 2. I can informally compare two or more functions.	**Personalized Learning:** In this learning plan, students will create and use an equation to describe a function within the context of a real-life situation. Students will begin to compare linear function examples within the same scenario. **Differentiated Support:** Students may be intentionally grouped for shared peer learning. Support will be provided through explicit instruction, small group, visual representations, and manipulatives (hands on and technology)

including reading these from a table or from a graph.		
• 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. • 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. • A.MM.1.5 Define appropriate quantities for the purpose of descriptive modeling. • A.FGR.2: Construct and interpret arithmetic sequences as functions, algebraically and graphically, to model and explain real-life phenomena. Use formal notation to represent linear functions and the key characteristics of graphs of linear functions, and informally compare linear and nonlinear functions using parent graphs. • A.FGR.2.2 Construct and interpret the graph of a linear function that models real-life phenomena and represent key characteristics of the graph using formal notation. • A.FGR.2.3 Relate the domain and range of a linear function to its graph and, where applicable, to the quantitative relationship it describes. Use formal interval and set notation to describe the domain and range of linear functions.	**Time-Graphs** https://lor2.gadoe.org/gadoe/file/a3caf917-958b-4067-9cb9-63a94ec07412/1/Time-Graphs-Student-Recording-Sheets.pdf **(Student Document)** https://lor2.gadoe.org/gadoe/file/a3caf917-958b-4067-9cb9-63a94ec07412/1/Time-Graphs-Learning-Plan.pdf **(Teacher Document)** **Learning Plan Description:** In this learning plan, students will analyze parts of a graph determining where a graph is constant, increasing, or decreasing, as well as identify the domain and range of that graph. These are two key characteristics that students will explore building from function notation as they are introduced to interval and set notation. Students will explore these characteristics in the context of the familiar concept of time graphs from the 8th grade. **Learning Goals:** 1. I can construct and interpret key characteristics of of linear functions 2. I can evaluate linear functions using function notation 3. I can relate the domain and range of a linear function to its graph using interval and set notation.	**Personalized Learning:** In this learning plan, students will analyze parts of a graph determining where a graph is constant, increasing, or decreasing, as well as identify the domain and range of that graph. These are two key characteristics that students will explore building from function notation as they are introduced to interval and set notation. Students will explore these characteristics in the context of the familiar concept of time graphs from the 8th grade. **Differentiated Support:** The teacher will ask probing questions, provide visual representations, and use manipulatives to engage students for meaningful learning.

• A.FGR.2.4 Use function notation to build and evaluate linear functions for inputs in their domains and interpret statements that use function notation in terms of a mathematical framework.		
• 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. • 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. • A.MM.1.4 – Use various mathematical representations and information to represent and solve real-life problems. • A.MM.1.5 – Define appropriate quantities for the purpose of descriptive modeling. A.FGR.2: Construct and interpret arithmetic sequences as functions, algebraically and graphically, to model and explain real-life phenomena. Use formal notation to represent linear functions and the key characteristics of graphs of linear functions, and informally compare linear and nonlinear functions using parent graphs.	**Characteristics of Linear Functions** https://lor2.gadoe.org/gadoe/file/5c39da33-a39a-4be2-b425-0e47d1a051a4/1/Enhanced-Characteristics-of-Linear-Functions-Student-Reproducibles.pdf (Student's Document) https://lor2.gadoe.org/gadoe/file/5c39da33-a39a-4be2-b425-0e47d1a051a4/1/Enhanced-Characteristics-of-Linear-Functions-Learning-Plan.pdf (Teacher's Document) **Learning Plan Description:** In this learning plan, students will dive deeply into key features of linear functions. This skill will prove useful to students as they seek to explore key features of other nonlinear functions. Students will explore key features of linear functions and their graphs including domain and range, end behavior, and where a graph is positive or negative. Students will then apply that knowledge to real-world phenomena to relate domain and range of linear function to its graph. **Learning Goals:** 1. I can construct and interpret graphs of linear functions 2. I can use functional notation to build and and evaluate linear functions 3. I can determine appropriate domain and range values given a context	**Personalized Learning:** In this learning plan, students will dive deeply into key features of linear functions. This skill will prove useful to students as they seek to explore key features of other nonlinear functions. Students will explore key features of linear functions and their graphs including domain and range, end behavior, and where a graph is positive or negative. Students will then apply that knowledge to real-world phenomena to relate domain and range of linear function to its graph. **Differentiated Support:** Students will be supported and enriched according to their level of understanding and proficiency of the concepts and standards. (formal and informal assessments)

• A.FGR.2.2 – Construct and interpret the graph of a linear function that models real life phenomena and represent key characteristics of the graph using formal notation. • A.FGR.2.3 – Relate the domain and range of a linear function to its graph and, where applicable, to the quantitative relationship it describes. Use formal interval and set notation to describe the domain and range of linear functions. • A.FGR.2.4 – Use function notation to build and evaluate linear functions for inputs in their domains and interpret statements that use function notation in terms of a mathematical framework.structures with this		

Content Resources

Textbook Correlation: enVision A|G|A - Algebra 1

A.FGR.2.1 - Lesson 3-4
A.FGR.2.2 - Lessons 3-2, 3-3
A.FGR.2.3 - Lesson 3-1
A.FGR.2.4 - Lessons 3-2, 3-3
A.FGR.2.5 - Lesson 5-1

Savvas Lessons: 8th Grade Standards

- Lesson 2-1 (Combine Like Terms to Solve Equations)
- Lesson 2-2 (Solve Equations with Variables on Both Sides)
- Lesson 2-3 (Solve Multi-Step Equations)
- Lesson 2-4 (Equations with No Solutions and Infinitely Many Solutions)