



Marietta City Schools
2025–2026 District Unit Planner

Algebra: Concepts & Connections

Unit title	Unit 2: Analyzing Linear Inequalities (DOE Unit 2) & Investigating Rational and Irrational Numbers (DOE Unit 3)	MYP year	4	Unit duration (hrs)	15 hours
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Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

GA DoE Standards

Standards

DOE Unit 2 - 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.

Fundamentals

- Students should be given the opportunity to explore the difference between solid lines and dashed lines through exploration on an interactive graph.
- Students should have had opportunities to create and solve linear equations and inequalities throughout middle school mathematics.
- Students should recognize that the graph of a linear inequality in two variables is a half-plane

Strategies and Methods

- When necessary, students should be able to rewrite the inequality in various forms, such as slope-intercept form, for graphing.
- Students should be given opportunities to solve linear inequalities graphically and algebraically. These linear inequalities should represent realistic, real-life phenomena.

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

Terminology

- Possible data points are solutions to the inequality or inequalities; data points that are not possible are non-solutions to the inequality or inequalities.

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

Fundamentals

- Ensure constraints are represented.
- Students in Grade 8 mathematics modeled with and solved systems of linear equations to solve real-life problems.

Strategies and Methods

- Students should be provided opportunities to use technology tools to solve systems of linear inequalities graphically.

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.

DOE Unit 3 - A.NR.5: Investigate rational and irrational numbers and rewrite expressions involving square roots and cube roots.

A.NR.5.1 Rewrite algebraic and numeric expressions involving radicals.

Relevance and Application

- Students should be able to use the operations of addition, subtraction, and multiplication, with radicals within expressions limited to square roots and cube roots.

A.NR.5.2 Using numerical reasoning, show and explain that the sum or product of rational numbers is rational, the sum of a rational number and an irrational number is irrational, and the product of a nonzero rational number and an irrational number is irrational.

Fundamentals

- The tasks selected should aid students with their development of a conceptual understanding of the sums and products of rational and irrational numbers through exploration and investigation.
- Students should be able to judge the reasonableness of an answer based on their understanding of rational and irrational numbers.

Examples

- Students should know that adding two irrational numbers, such as $3\sqrt{5}$ and $\sqrt{7}$, may result in an irrational number.
- The side length of a square is $\sqrt{8}$. Is the perimeter a rational or irrational number?

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

- 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

Students will identify perfect squares and perfect cubes.

Students will perform and simplify operations with radical expressions, both square root and cubed root.

Students will investigate sums and products of rational and irrational numbers.
 Students will investigate how square roots and cubed roots are used when finding perimeter, area, and volume of figures.

Vocabulary

DOE Unit 2 -					
Boundary Line	Inequality	Linear Function	Solution Set		
DOE Unit 3 -					
Composite Number	Cube Root	Factor	Fractions	Index	Integers
Irrational Number	Natural Numbers	Non-repeating Decimal	Non-terminating Decimal	Operation	Perfect squares
Prime Number	Power	Radical Sign	Radicand	Ratio	Rational Number
Real Numbers	Repeating Decimals	Root	Square	Square Root	Terminating Decimal
Whole Numbers	Zero	Radical Expression			

Notation

< , > , ≤ , ≥ - Inequality Symbols

Square Root -

\sqrt{x} Cubed Root - $\sqrt[3]{x}$ Nth Root - $\sqrt[n]{x}$

Key concept	Related concept(s)	Global context
Relationships Identify and understand connections and associations between properties, objects, people, and ideas - including the human community's connections with the world in which we live.	Models, Systems, and Validity	Scientific and Technical Innovation - Systems, models, methods; products, processes and solutions

Statement of inquiry

Relationships formed by modeling systems validate products, processes, and solutions.

Inquiry questions

DOE Unit 2 -

Factual—

- What is an inequality?
- What symbols are used to represent inequalities?
- What is a solution to a linear inequality?
- What is a non-solution to a linear inequality?

Conceptual—

- How do you write a linear inequality given a graph or real - world context?
- How do you model linear inequalities given an inequality or real - world context?

Debatable-

- Is one solution more valid than another given appropriate real - world relationships for systems of inequalities?

DOE Unit 3 -

Factual—

- What is a cubed root?
- What is a rational number?
- What is an irrational number?
- What are the operations that can be used with square roots and cube roots within expressions?

Conceptual—

- In what ways can models be used to represent and explore the relationships between rational and irrational numbers?
- How do the concepts of patterns and systems relate to the properties and relationships of rational and irrational numbers?

Debatable-

- What is the most efficient method for simplifying expressions involving radical expressions?

MYP Objectives	Assessment Tasks	
<i>What specific MYP objectives will be addressed during this unit?</i>	<i>Relationship between summative assessment task(s) and statement of inquiry:</i>	<i>List of common formative and summative assessments.</i>
MYP D - Concerts, Accounts, and Advertisements MYP C - Evaluating Statements about Irrational and Rational Numbers (modified) HONORS: MYP C - What do you recommend?	DOE Unit 2 - Summative assessment will have MYP D that directly pulls products and processes into student evidence. DOE Unit 3 - Summative will have properties of rational and irrational numbers in which students delineate between the two models.	<u>Formative Assessment(s):</u> Mid Unit Check <u>Summative Assessment(s):</u> Unit 2 Assessment - Milestone Type Questions MYP D - Concerts Unit 3 Assessment
Approaches to learning (ATL)		
Category: Thinking Skills Cluster: Transfer Skill Indicator: Combine knowledge, understanding and skills to create products or solutions Learning Activity: MYP D - Concerts, Accounts, and Advertisements		

<u>Learning Experiences</u>		
Objective or Content	Learning Experiences	Personalized Learning and Differentiation
<ul style="list-style-type: none"> ● A.PAR.4.3 Solve systems of linear inequalities by graphing, including systems representing a mathematically applicable situation. 	<p>Solutions to Systems of Linear Inequalities in Two Variables - Remember These Situations? (Banking, Concert, Advertising) (On-Level)</p> <p>Description: In this learning plan, students will be writing linear inequalities that represent constraints in situations and graphing the solution regions. To prepare for that work, students will review writing and graphing an equation that represents a situation.</p> <p>Learning Goal:</p> <ul style="list-style-type: none"> ● I can graph a linear inequality using the boundary line and the correct solution region. ● I can interpret solutions of linear inequalities in context. ● I can write inequalities in two variables given real-world constraints. 	<p>Remedial support can be given by writing linear equations from real world application.</p> <p>Language support can be given by drawing context clues from the problems provided. IF necessary adjust to culturally appropriate situations.</p>
<ul style="list-style-type: none"> ● 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. 	<p>Graphing Linear Inequalities in Two Variables - Fair is Coming to Town (Part 1 - On-level, Part 2 - Honors)</p> <p>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 that points of a region bounded by a line. Students will begin by observing that 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.</p> <p>Learning Goal</p> <ul style="list-style-type: none"> ● I can determine solutions and nonsolutions given the graph of a two-variable inequality. ● I can describe the graph that represents the solutions to a linear inequality in two variables. 	<p>Remedial support can be given by focusing on graphing linear equations either using technology or peg boards.</p> <p>Language support can be given by previewing key words and context.</p>
<ul style="list-style-type: none"> ● 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. 	<p>Too Big or Not Too Big? - Mathematics Vision Project HONORS Module 5.2 (Honors)</p> <p>Description: Students will apply knowledge that a solution to a linear inequality in two variables could involve not only points on a line, but that points of a region bounded by a line. Students will then work within the context of being a pet sitter to examine and extend ideas, strategies and representations related to creating, graphing and interpreting linear inequalities in two variables.</p> <p>Learning Goal(s)</p> <ul style="list-style-type: none"> ● I can determine solutions and nonsolutions given the graph of a two-variable inequality. ● I can describe the graph that represents the solutions to a linear inequality in two variables. ● I can graph linear inequalities in two variables. 	<p>Learning Support could include previewing vocabulary and symbols.</p> <p>Extension opportunities may include students creating their own example to share with class.</p>

Content Resources

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

A.FGR.4.1 - Lesson 4-4

A.FGR.4.2 - Lesson 4-4

A.FGR.4.3 - Lesson 4-5

A.NR.5.1 - Lesson 1-1, 9-3, 9-4

A.NR.5.2 - Lesson 1-1