Marietta City Schools

2024–2025 District Unit Planner

Grade 7 Honors Mathematics

Unit title	Unit 2: Reasoning with Expressions, Equations, and Inequalities	**MYP year**	2	**Unit duration (hrs)**	*27 hours*

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

GA DoE Standards

Standards

7.PAR.2 Use properties of operations, generate equivalent expressions and interpret the expressions to explain relevant situations.
7.PAR.3 Represent authentic situations using equations and inequalities with variables; solve equations and inequalities symbolically, using the properties of equality.
7.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.

Strand 2: Creative Thinking Skills
Students will develop and utilize creative thinking through a variety of products
and problem solving.
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.
Strand 4: Advanced Communication and Collaboration Skills
Students will develop advanced communication and collaboration skills in
working toward a common goal with shared
accountability for the final outcome.

Concepts/Skills to support mastery of standards

PATTERNING & ALGEBRAIC REASONING *– linear expressions with rational coefficients, complex unit rates, proportional relationships*			
7.PAR.2: Use properties of operations, generate equivalent expressions and interpret the expressions to explain relevant situations.			
Expectations		**Evidence of Student Learning** **(not all inclusive; see Grade Level Overview for more details)**	
7.PAR.2.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	***Fundamentals*** • Building on work in Grade 6, where students used conventions about the order of operations to rewrite simple expressions such as 2(3 + 8x) as 6 + 16x and 10p - 2 as 2(5p-1), students now encounter linear expressions with more operations that require an understanding of integers, such as 7 - 2(3 - 8x).	***Examples*** • A rectangle is twice as long as it is wide. One way to write an expression to find the perimeter would be w + w + 2w + 2w. Write the expression in two other ways. • Write an equivalent expression for 9 – 7(2x + 4).
7.PAR.2.2	Rewrite an expression in different forms from a contextual problem to clarify the problem and show how the quantities in it are related.	***Example*** • If Madison and Brenda both get paid a wage of $11 per hour, but Madison was paid an additional $55 for overtime, the expression 11(M+B) + 55 may be more clearly interpreted as 11M+55+11B for purposes of understanding Brenda's pay separated from Madison's pay.	
7.PAR.3: Represent authentic situations using equations and inequalities with variables; solve equations and inequalities symbolically, using the properties of equality.			
Expectations		**Evidence of Student Learning** **(not all inclusive; see Grade Level Overview for more details)**	
7.PAR.3.1	Construct algebraic equations to solve practical problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Interpret the solution based on the situation.	***Strategies and Methods*** • Students should be able to represent relationships in various practical, mathematical situations with equations involving variables and positive and negative rational numbers and explain the	***Fundamentals*** • Students should be able to fluently solve equations of the specified forms presented in ***Terminology*** • Fluently/Fluency – Students choose flexibly among methods and strategies to solve mathematical problems accurately and efficiently. ***Age/Developmentally Appropriate*** • Continue to build on 6th grade objectives of writing and solving one-step equations from a problem situation to multi-step ***Examples*** • Vicky and Bob went to a store to buy school supplies. Vicky spent a total of $22 on school supplies. She spent $13 on a book and spent the rest of the money on notebooks. The store sells notebooks for $1.50 each. Without using a variable,

		meaning of the solution based on the situation. • Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.	the learning objective. • Students should use the properties of equality to solve for the value of a variable.		problem situations. This is another opportunity for students to practice using rational numbers including: integers, and positive and negative fractions and decimal numbers.	determine the number of notebooks Vicky bought. • Write an equation that can be used to find the number of notebooks Vicky bought. Use the variable v for the number of notebooks. Solve the equation. Explain the similarities and differences between finding the number of notebooks Vicky bought with and without a variable, paying attention to the sequence of your operations.
7.PAR.3.2	Construct algebraic inequalities to solve problems, leading to inequalities of the form $px \pm q > r$, $px \pm q < r$, $px \pm q \leq r$, or $px \pm q \geq r$, where p, q, and r are specific rational numbers. Graph and interpret the solution based on the realistic situation that the inequalities represent.	***Strategies and Methods*** • Students should be able to represent relationships in various authentic, mathematical situations with inequalities involving variables and positive and negative rational numbers. • Students should be able to fluently solve inequalities of the specified forms. To achieve fluency, students should be able to choose flexibly among methods and strategies to solve mathematical problems accurately and efficiently. • Students should use the properties of inequality to solve for the value of a variable. • When identifying a specific value for p, q, and r, any rational number can be used. • Students should be able to graph and interpret the solution of an inequality used as a model to explain real phenomena.			***Example*** • As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make and describe the solutions.	

Vocabulary

K12 Mathematics Glossary

Algebraic Expression
Term
Coefficient
Constant
Equation
Inequality
Numerical Expression
Variable
Rate of production
Rate of attrition
Percentage

Key concept	Related concept(s)	Global context
Relationships The connections and associations between properties, objects, people and ideas.	**Equivalence, Justification**	**Identities and Relationships**

Statement of inquiry
Logic can be used to justify equivalent relationships.

Inquiry questions
Factual— What are the parts of an algebraic expression? What is the difference between an expression and an equation? What are the similarities and differences between equations and inequalities? **Conceptual—** How can variables be used to represent values? How is an equation different from an expression? How is an equation like a balance scale? How are variables used to solve equations? What strategies can we use to solve and graph inequalities? **Debatable-** Is there more than one way to represent a linear equation? Is there a best way to solve a 2-step equation?

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.*

Criterion A: Knowing and Understanding Criterion B: Investigating Patterns Criterion C: Communicating Criterion D: Applying mathematics in real-life contexts	Students will be expected to develop a deeper understanding of numbers. Students will be expected to learn how to solve multi- step equations and discuss the difference between equations and expressions, as well as solve and interpret solutions to real-world situations.	**Formative Assessment(s):** Unit 2 CFA **Summative Assessment(s):** Unit 2: Reasoning with Expressions, Equations, and Inequalities. MYP Assessment: Performance Task A

Approaches to learning (ATL)

Category: Social
Cluster: Collaboration Skills
Skill Indicator:
Give and receive meaningful feedback.

Category: Self Management
Cluster: Organization, Affective, & Reflection Skills
Skill Indicator: Practice “bouncing back” after adversity, mistakes, and failures

Design Cycle Transdisciplinary: Inquiring and Analyzing, Developing Ideas, Creating a Solutions, Evaluation

Learning Experiences Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
7.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. **7.PAR.2:** Use properties of operations, generate equivalent expressions and interpret the expressions to explain relevant situations. ● 7.PAR.2.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. ● 7.PAR.2.2: Rewrite an expression in different forms from a contextual problem to clarify the problem and show how the quantities in it are related.	**Algebraic Expressions in Geometric Contexts** Learning Plan Description: In this learning plan, students will add and subtract algebraic expressions in the context of the construction of an innovative classroom. Teacher Guidance Student Reproductible **Learning Goals** ● I can apply properties of operations when rewriting and evaluating algebraic expressions. ● I can rewrite algebraic expressions to determine the area and perimeter of geometric figures. ● I can evaluate algebraic expressions to determine the area and perimeter of geometric figures.	Engage: Whole Group Explore and Apply: Collaborative Groups or Partners Reflect: Individual
7.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. **7.PAR.2** Use properties of operations, generate equivalent expressions and interpret the expressions to explain relevant situations. **7.PAR.2.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. **7.PAR.2.2** Rewrite an expression in different	**Efficiently Solving Inequalities** In this learning task, students will practice solving inequalities with both positive and negative coefficients, and to connect the solutions of inequalities to their graphs. Learning Goals ● I can solve an inequality with rational numbers and graph the solutions. ● I can test values to decide which inequality symbol makes sense. Teacher Guidance Student Reproductibles Desmos	Engage: Whole Group Explore and Apply: Partner or Collaborative Groups Reflect: Individual

forms from a contextual problem to clarify the problem and show how the quantities in it are related. **7.PAR.3** Represent authentic situations using equations and inequalities with variables; solve equations and inequalities symbolically, using the properties of equality. **7.PAR.3.1** Construct algebraic equations to solve practical problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Interpret the solution based on the situation. **7.NR.1** Solve relevant, mathematical problems, including multi-step problems, involving the four operations with rational numbers and quantities in any form (integers, percentages, fractions, and decimal numbers). **7.NR.1.11** Solve multi-step contextual problems involving rational numbers, converting between forms as appropriate, and assessing the reasonableness of answers using mental computation and estimation strategies. **<u>Gifted Standards:</u>** **Strand 2: Creative Thinking Skills** Students will develop and utilize creative thinking through a variety of products and problem solving. **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. **Strand 4: Advanced Communication and Collaboration Skills** Students will develop advanced communication and collaboration skills in		

working toward a common goal with shared accountability for the final outcome.		

Content Resources

Intervention Tasks:

Balancing Act, **Choices** **Solving Linear Equations** 7.PAR.3

-Form and solve simple linear equations

Other Resources

GaDoe Frameworks

Savvas: **6-11 Savvas Correlation to 2021 standards**

GaDOE Unit 2 Curriculum Map