Marietta City Schools

2023–2024 District Unit Planner

Accelerated Grade 6/7 Mathematics

Unit title	Unit 5: Building Conceptual Understanding of Expressions	**MYP year**	*1*	**Unit duration (hrs)**	*20 hours total*

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

GA DoE Standards

Standards

6.PAR.6: Identify, write, evaluate, and interpret numerical and algebraic expressions as mathematical models to explain authentic 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.
6.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.
MCS.Gifted.S4B. Recognize and examine the value of others strengths, thoughts, ideas, and feelings during collaboration.
MCS.Gifted.S3C Use a variety of strategies for solving authentic, complex, real world problems through evaluative thinking and the engineering design processes.
MCS.Gifted.S4D Respectfully collaborate and effectively communicate exchanges of constructive/critical feedback.
MCS.Gifted.S6 Students will become self-directed, independent learners.

Concepts/Skills to support mastery of standards

6.PAR.6.1	Write and evaluate numerical expressions involving rational bases and whole-number exponents.	***Strategies and Methods*** • Students should interpret relevant, mathematical situations to write and evaluate numerical expressions.		
6.PAR.6.2	Determine greatest common factors and least common multiples using a variety of strategies to make sense of applicable problems.	***Strategies and Methods*** • Investigate the distributive property using sums and its use in adding numbers 1-100 with a common factor. • Students should apply these strategies to solve applicable, mathematical problems.	***Age/Developmentally Appropriate*** • Students should also be able to apply the least common multiple of two whole numbers less than or equal to 12 to solve applicable, mathematical problems. • Students should be able to determine the greatest common factor of 2 whole numbers (from	***Example*** • Hotdogs come in a package of 8 and buns in a package of 12. How many packages of hot dogs and packages of buns would you need to purchase to have an equal number of hot dogs and buns?

			1-100) and use the distributive property to express a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers with no common factors (GCF).	
6.PAR.6.3	Write and read expressions that represent operations with numbers and variables in realistic situations.	***Strategies and Methods*** • Students should identify parts of an expression using mathematical terms (sum, difference, term, product, factor, quotient, coefficient, variable, constant); view one or more parts of an expression as a single entity. • Students should translate from a word form into variable expression. • Students should understand letters called variables represent unknown numbers and the same rules apply in operations with numbers also apply in operations with variables.	***Examples*** • Express the calculation "Subtract x from 9" as 9 – x. • Describe the expression 2(8+7) as a product of two factors; view (8+7) as both a single entity and a sum of two terms. • Some of the students at Georgia Middle School like to walk to and from school. They always walk unless it rains. Let d be the distance in miles from a student's home to the school. Write two different expressions that represent how far a student travels by walking in a two-week period if there is one rainy day each week. • Possible Solution: The distance to school, and therefore home, is d. Thus, the student rides (d + d) miles in one day. Equivalently, she rides (2d) miles in one day. Repeatedly adding the distance traveled in one day for each school day of the week, we find that in one week the student travels (2d + 2d + 2d + 2d + 2d) miles. Equivalently, she travels 5(2d) or (10d) miles in a normal, rain free week.	
6.PAR.6.4	Evaluate expressions when given values for the variables, including expressions that arise in everyday situations.	***Fundamentals*** • Students should evaluate algebraic expressions for a given value of a variable, using the order of operations. • Students should perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).		
6.PAR.6.5	Apply the properties of operations to identify and generate equivalent expressions.	***Example*** • Apply the distributive property to the expression 3(2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6(4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.	***Age/Developmentally Appropriate*** • This standard includes distributive property and combining like terms.	

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.	

Vocabulary:

K12 Mathematics Standards Glossary

Algebraic Expression	**Distributive Property**	**Associative Property of Addition**	**Exponent**	**Associative Property of Multiplication**	**Expression**
Coefficient	**Like Terms**	**Community Property of Addition**	**Order of Operations**	**Commutative Property of Multiplication**	**Term**
Constant	**Variable**	**Numerical Expression**			

Key concept	Related concept(s)	Global context
Logic A method of reasoning and a system of principles used to build arguments and reach conclusions.	**Model, Pattern, Measurement**	**Orientation in Time and Space**
Statement of inquiry		
Expressions, equations and inequalities communicate real world scenarios through symbols, numbers, and algebraic thinking.		
Inquiry questions		
Factual		

- How is the order of operations used to evaluate expressions?
- What is the purpose of an exponent?
- How can I tell if two expressions are equivalent?
- How are exponents used when evaluating expressions?
- How are the properties used to evaluate expressions?

Conceptual

- How are word expressions that are translated into algebraic expressions communicating the same information?
- What strategies help me to understand and represent real life situations mathematically?

Debatable:

- Why do solutions to real world algebraic problems not always what they seem?

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.*
Criteria A (Knowing and Understanding) and Criteria C (Communication)	Students will be able to represent, evaluate, and translate different parts of an algebraic expression in real world mathematical problems. Students will also be able to use the properties to identify and generate equivalent expressions.	**Formative Assessment(s):** MYP: Gardening Distributive Property Project **Summative Assessment(s):** Unit 5 CSA Unit 5 Summative

Approaches to learning (ATL)
Category: Social **Cluster:** Collaboration Skills **Skill Indicator:** Give and receive meaningful feedback. **Category:** Communication **Cluster:** Communication **Skill Indicator:** Read critically and for comprehension

Learning Experiences Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
6.PAR.6.1 Write and evaluate numerical expressions involving rational bases and whole -number exponents. **6.PAR.6.3** Write and read expressions that represent operations with numbers and variables in realistic situations. **6.PAR.6.4** Evaluate expressions when given values for the variables, including expressions that arise in everyday situations. **6.PAR.6.5** Apply the properties of operations to identify and generate equivalent expressions.	**Pool Border Problem** In this learning plan, students will first construct expressions with numbers to determine the number of tiles that border a pool. They will use those numerical expressions to help them write an expression with variables. Then they will put the algebraic expression to the test and see if it helps them find the tiles for lots of pools very quickly. Students will also be asked to analyze different peer-generated expressions for equivalence. The learning goals are: 1. I can write and evaluate numerical expressions involving rational bases and whole-number exponents. 2. I can identify and generate equivalent expressions using the Distributive Property.	To support learning, consider providing grid paper with representations of pools pre-drawn. To extend learning, students could increase the use of multiple representations to depict their mathematical thinking and evaluate the thinking of others.
Content Resources		
6-11 Savvas Correlation to 2021 standards **GaDoe Intervention Table of Tasks/Activities** **Additional Resources** ● **Savvas** ● **Desmos** ● **Hands-On Math**		