



Marietta City Schools

District Unit Planner

Everything on the unit planner must be included on the unit curriculum approval statement.

Grade 6 Advanced Studies

Unit title	Unit 3- Expressions	MYP year	1	Unit duration (hrs)	30 Hours
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Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

### GSE Standards

#### Standards

**Apply and extend previous understandings of arithmetic to algebraic expressions.**

**MGSE6.EE.1** Write and evaluate expressions involving whole-number exponents.

**MGSE6.EE.2** Write, read, and evaluate expressions in which letters stand for numbers.

**MGSE6.EE.2a** Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract  $y$  from 5” as  $5-y$ .

**MGSE6.EE.2b** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, 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.

**MGSE6.EE.2c** Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. 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). For example, use the formulas  $V = s^3$  and  $A = 6s^2$  to find the volume and surface area of a cube with sides of length  $s = 1.2$ .

**MGSE6.EE.3** Apply the properties of operations to generate equivalent expressions. For 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  $3y$ .

**MGSE6.EE.4** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them.) For example, the expressions  $y + y + y$  and  $3y$  are equivalent because they name the same number regardless of which number  $y$  stands for.

**MGSE6.NS.4** Find the common multiples of two whole numbers less than or equal to 12 and the common factors of two whole numbers less than or equal to 100.

a. Find the greatest common factor of 2 whole numbers and use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factors. (GCF) Example:  $36 + 8 = 4(9 + 2)$

b. Apply the least common multiple of two whole numbers less than or equal to 12 to solve real-world problems.

### **Concepts/Skills to be Mastered by Students**

- Represent repeated multiplication with exponents.
- Evaluate expressions containing exponents to solve mathematical and real world problems.
- Translate verbal phrases and situations into algebraic expressions.
- Identify the parts of a given expression.
- Use the properties to identify equivalent expressions.
- Use the properties and mathematical models to generate equivalent expressions.

### **Vocabulary**

- Algebraic expression: A mathematical phrase involving at least one variable and sometimes numbers and operation symbols.
- Associative Property of Addition: The sum of a set of numbers is the same no matter how the numbers are grouped.
- Associative Property of Multiplication: The product of a set of numbers is the same no matter how the numbers are grouped.
- Coefficient: A number multiplied by a variable in an algebraic expression.
- Commutative Property of Addition: The sum of a group of numbers is the same regardless of the order in which the numbers are arranged.
- Commutative Property of Multiplication: The product of a group of numbers is the same regardless of the order in which the numbers are arranged.
- Constant: A quantity that does not change its value.
- Distributive Property: The sum of two addends multiplied by a number is the sum of the product of each addend and the number.
- Exponent: The number of times a number or expression (called base) is used as a factor of repeated multiplication. Also called the power.
- Like Terms: Terms in an algebraic expression that have the same variable raised to the same power. Only the coefficients of like terms are different.
- Order of Operations: The rules to be followed when simplifying expressions.
- Term: A number, a variable, or a product of numbers and variables.
- Variable: A letter or symbol used to represent a number or quantities that vary

Key concept	Related concept(s)	Global context
<b>Logic</b> A method of reasoning and a system of principles used to build arguments and reach conclusions.	Model, pattern, measurement	Orientation in Time and Space
<b>Statement of inquiry</b>		
Expressions, equations and inequalities communicate real world scenarios through symbols, numbers, and algebraic thinking.		
<b>Inquiry questions</b>		
<b>Factual</b> — 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	
<i>What specific MYP <b>objectives</b> will be addressed during this unit?</i>	<b>Relationship</b> between summative assessment task(s) and statement of inquiry:	<i>List of common formative and summative assessments.</i>
Criterion B - Investigating Patterns	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.	<p><b><u>Formative Assessment(s):</u></b> Unit 3 CFA - EE.1, NS.4, EE. 3</p> <p><b><u>Summative Assessment(s):</u></b> Unit 3 Test - all standards MYP Assessment - Gardening Distributive Property Project</p>
<b>Approaches to learning (ATL)</b>		
<p><b>Category:</b> Social <b>Cluster:</b> Collaboration Skills <b>Skill Indicator:</b> Give and receive meaningful feedback.</p> <p><b>Category:</b> Communication <b>Cluster:</b> Communication <b>Skill Indicator:</b> Read critically and for comprehension</p>		

**Learning Experiences**

Add additional rows below as needed.

Objective or Content	Learning Experiences	Personalized Learning and Differentiation
<p><b>MGSE6.EE.4</b> Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them.) For example, the expressions <math>y + y + y</math> and <math>3y</math> are equivalent because they name the same number regardless of which number <math>y</math> stands for.</p>	<p><b>Combining Like Terms Using Algebra Tiles</b> In this task students will be able to use multiple representations to model and combine like terms in an expression. Students will be expected to make sense of problems through the use of manipulatives and make connections between the concrete representation and the more abstract, mathematical expressions. Teachers can use this opportunity to formatively assess student’s understanding of 6th Grade standard EE.4.</p>	<p>Students will be intentionally grouped and provided with supports through intentional planning and implementation using the 5 Practices and monitoring tool that promotes math discourse within their groups.</p>
<p><b>MGSE6.EE.2</b> Write, read, and evaluate expressions in which letters stand for numbers.</p> <p><b>MGSE6.EE.2a</b> Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract <math>y</math> from 5” as <math>5-y</math>.</p>	<p><b>Build a Dog</b> In this task students will be able to create a pattern and use it to read, write, and create an algebraic expression in a fun and unique way. Students will use the appropriate tools to model mathematically and interpret the model as an expression. Students must reason abstractly and quantitatively when developing expressions and solving problems. Teachers can use this opportunity to formatively assess student’s understanding of 6th Grade standard EE.2.</p>	<p>Students will be supported through intentional planning and implementation using the 5 Practices. Teachers will support through assessing and advancing questions and aggressive monitoring of students through the task. Students will have access to T charts and algebra tiles to support their learning.</p>

**Content Resources**

Savvas- Topic 3  
Illustrative Mathematics  
NCTM Illuminations  
GaDOE Frameworks  
Algebra Tiles, Color Tiles, Pattern blocks

