



Marietta City Schools

District Unit Planner

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

Grade 7 Mathematics

Unit title	Unit 2: Expressions and Equations	MYP year	2	Unit duration (hrs)	20 hours
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Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

### GSE Standards

#### Standards

##### **Use properties of operations to generate equivalent expressions.**

**MGSE7.EE.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

**MGSE7.EE.2** Understand that rewriting an expression in different forms in a problem context can clarify the problem and how the quantities in it are related. *For example  $a + 0.05a = 1.05a$  means that adding a 5% tax to a total is the same as multiplying the total by 1.05.*

##### **Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**

**MGSE7.EE.3** Solve multistep real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals) by applying properties of operations as strategies to calculate with numbers, converting between forms as appropriate, and assessing the reasonableness of answers using mental computation and estimation strategies.

*For example:*

- *If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50.*
- *If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*

**MGSE7.EE.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

**MGSE7.EE.4a** Solve word problems leading to equations of the form  $px + q = r$  and  $p(x + q) = r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*

**MGSE7.EE.4b** Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For 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.*

**MGSE7.EE.4c** Solve real-world and mathematical problems by writing and solving equations of the form  $x + p = q$  and  $px = q$  in which  $p$  and  $q$  are rational numbers.

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

- Variables can be used to represent numbers in any type of mathematical problem.
- Understand the difference between an expression and an equation.
- Write and solve multi-step equations including all rational numbers.
- Some equations may have more than one solution
- There are differences and similarities between equations and inequalities.

**Vocabulary**

- Algebraic expression- A mathematical phrase that consists of variables, numbers, and operation symbols.
- Coefficient- The number part of a term that contains a variable.
- Constant- A term that only contains a number.
- Equation- A mathematical sentence that includes an equals sign to compare two expressions.
- Inequality- A mathematical sentence that uses  $<$ ,  $\leq$ ,  $>$ ,  $\geq$ , or  $\neq$  to compare two quantities.
- Term- A number, a variable, or the product of a number and one or more variables.
- Numerical expression- A mathematical phrase that consists of numbers and operation symbols.
- Variable - A letter that represents an unknown value.

Key concept	Related concept(s)	Global context
Relationships	Equivalence and Justification	Identities and Relationships
<b>Statement of inquiry</b>		
Logic can be used to justify equivalent relationships.		
<b>Inquiry questions</b>		
<b>Factual</b> —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?		
<b>Conceptual</b> —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?		
<b>Debatable</b> — 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	
<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 A: Knowing and Understanding  Criterion B: Investigating Patterns  Criterion C: Communicating  Criterion D: Applying mathematics in real-life contexts	Students will understand how to solve multi- step equations and discuss the difference between equations and expressions.	<b><u>Formative Assessment(s):</u></b>  Unit 2 CFA  <b><u>Summative Assessment(s):</u></b>  Unit 2: Expressions and Equations  MYP: Topic 5 Performance Assessment Form B
<b>Approaches to learning (ATL)</b>		
<p>Give and receive meaningful feedback. Practice “bouncing back” after adversity, mistakes, and failures.</p> <p><b>Category:</b> Social <b>Cluster:</b> Collaboration Skills <b>Skill Indicator:</b> Give and receive meaningful feedback.</p> <p><b>Category:</b> Thinking <b>Cluster:</b> Critical Thinking, Creative Thinking &amp; Transfer <b>Skill Indicator:</b> Apply skills and knowledge in unfamiliar situations.</p>		

**Learning Experiences**

Add additional rows below as needed.

Objective or Content	Learning Experiences	Personalized Learning and Differentiation
<b>MGSE7.EE.3</b> Solve multistep real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals) by applying properties of operations as strategies to calculate with numbers, converting between forms as appropriate, and assessing the reasonableness of answers using mental computation and estimation strategies.	<b><u>Area and Perimeter Performance Task</u></b>	This activity can be implemented in groups with provided scaffolds throughout along with intentional questioning.
<b>MGSE7.EE.4a</b> Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$ , where $p$ , $q$ , and $r$ are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.	<b><u>Solving Equation Error Analysis</u></b>	This activity can be completed individually or in a group. Students can be provided with manipulatives and calculators. Teachers can start the activity together and gradually release students.
<b>MGSE7.EE.4b</b> Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$ , where $p$ , $q$ , and $r$ are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.	<b><u>T.V. Time And Video Games</u></b> <a href="https://www.georgiastandards.org/Georgia-Standards/Frameworks/7th-Math-Unit-2.pdf">https://www.georgiastandards.org/Georgia-Standards/Frameworks/7th-Math-Unit-2.pdf</a> In this task, students will create inequalities to represent a situation. They will solve these inequalities and graphs in order to provide a visual representation of the real-life situation.	This activity can be completed individually or in a group. Incorporate more examples of how to solve inequalities before beginning the task.

**Common Content Resources**

Savvas

Illuminations

