# Unit 1: Investigating Linear Expressions, Equations, and Inequalities in One Variable

## MYP year
3

## Unit duration (hrs)
22.5 hours

**MMS- (4.5 hours per week)**

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

#### GA DoE Standards

**Standards**

8.PAR.3: Create and interpret expressions within relevant situations. Create, interpret, and solve linear equations and linear inequalities in one variable to model and explain real phenomena.

8.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.

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Resources, materials, assessments not linked to SGO or unit planner will be reviewed at the local school level.
<table>
<thead>
<tr>
<th>Expectations</th>
<th>Evidence of Student Learning</th>
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</table>
| 8.PAR.3.1 Interpret expressions and parts of an expression, in context, by interpreting formulas or expressions with multiple terms and/or factors. | **Fundamentals**  
- Students should build on their prior knowledge of understanding the parts of an expression to extend their understanding to more complex expressions with multiple terms and/or factors.  

**Terminology**  
- Parts of an expression include terms, factors, coefficients, and operations.  

**Strategies and Methods**  
- Building upon skills from Grade 7, students combine like terms on the same side of the equal sign and use the distributive property to simplify the equation when solving. Emphasis in this standard is also on using rational coefficients. Solutions of certain equations may elicit infinitely many or no solutions.  

**Solutions**  
- One Solution  
- No Solution  
- Infinitely Many Solutions  

**Expressions**  
- One Solution  
- No Solution  
- Infinitely Many Solutions  

**Variables**  
- Operation  

**Inverse**  
- Solutions  
- One Solution  
- No Solution  
- Infinitely Many Solutions  

**Equations**  
- Inequalities  

## Vocabulary

### K12 Mathematics Glossary

<table>
<thead>
<tr>
<th>Terms</th>
<th>Factors</th>
<th>Coefficient</th>
<th>Constant</th>
<th>Variable</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverse</td>
<td>Solutions</td>
<td>One Solution</td>
<td>No Solution</td>
<td>Infinitely Many Solutions</td>
<td>Expression</td>
</tr>
</tbody>
</table>

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Patterns
- Algebraic

Justification. Simplification

Identities and relationships

Statement of inquiry
Interpreting real life scenarios will enhance our understanding of patterns.

Inquiry questions

- **Factual**— How can we simplify expressions? How can we use inverse operations to solve equations and inequalities?
- **Conceptual**— How are order of operations related to solving equations and equalities?
- **Debatable** - What is the best form of representing numbers and expressions?

<table>
<thead>
<tr>
<th>MYP Objectives</th>
<th>Assessment Tasks</th>
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<tbody>
<tr>
<td><strong>What specific MYP objectives will be addressed during this unit?</strong></td>
<td><strong>Relationship between summative assessment task(s) and statement of inquiry:</strong> Students will interpret real life scenarios to enhance their understanding of patterns.</td>
</tr>
<tr>
<td>Criteria A: Knowledge and Understanding Criteria B: Investigating Patterns</td>
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**Formative Assessment(s):**
- Unit 1 CFA

**Summative Assessment(s):**
- Unit 1 Summative Assessment
- Unit 1 Retest
- MYP Assessment: Escape Room (add inequalities)

**Category:** Thinking  
**Cluster:** Critical Thinking, Creative Thinking  
**Skill Indicator:** Analyzing and evaluating issues and ideas and Utilizing skills and knowledge in multiple contexts

**Learning Experiences**
Add additional rows below as needed.

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<table>
<thead>
<tr>
<th>Objective or Content</th>
<th>Learning Experiences</th>
<th>Personalized Learning and Differentiation</th>
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<tbody>
<tr>
<td>8.PAR.3: Create and interpret expressions within relevant situations. Create, interpret and solve linear equations and linear inequalities in one variable to model and explain real phenomena.</td>
<td><strong>Geology Rocks</strong>&lt;br&gt;Brief Description: In this learning plan, students explore linear equations with manipulatives and discover various steps used in solving equation problems. Students use blocks and counters as tactile representations to help them solve for unknown values of x. Students should work in groups or pairs. This will encourage discussion during the lesson, which will help with understanding the manipulative representation.&lt;br&gt;Learning Goals:&lt;br&gt;1. I can use algebraic reasoning in describing the solutions to linear equations.&lt;br&gt;2. I can interpret expressions and linear equations to model real world situations.&lt;br&gt;3. I can justify the steps to a linear equation.</td>
<td>In this learning plan, students explore linear equations with manipulatives and discover various steps used in solving equation problems. Students use blocks and counters as tactile representations to help them solve for unknown values of x. Students should work in groups or pairs. This will encourage discussion during the lesson, which will help with understanding the manipulative representation.</td>
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<td>8.PAR.3: Create and interpret expressions within relevant situations. Create, interpret, and solve linear equations and linear inequalities in one variable to model and explain real phenomena.</td>
<td><strong>Building and Solving Linear Equations</strong>&lt;br&gt;Brief Description:&lt;br&gt;In this learning plan, students will create and solve linear equations. Teachers will be able to identify difficulties students may have when solving equations with one variable and solve linear equations in more than one way.&lt;br&gt;Learning Goals:&lt;br&gt;1. I can solve equations with one variable.&lt;br&gt;2. I can solve linear equations in more than one way.&lt;br&gt;3. I can use algebraic reasoning to describe solutions to linear equations.</td>
<td>In this learning plan, students will create and solve linear equations. Teachers will be able to identify difficulties students may have when solving equations with one variable and solve linear equations in more than one way.</td>
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<td>8.PAR.3: Create and interpret expressions within relevant situations. Create, interpret, and solve linear equations and linear inequalities in one variable to model and explain real phenomena.</td>
<td><strong>Classification of Solutions</strong>&lt;br&gt;Brief Description:&lt;br&gt;In this learning plan, students will solve linear equations in one variable with rational number coefficients and simplify expressions through combining like terms and the distributive property. Students will also get an opportunity to categorize linear equations in one variable as having one, none, or infinitely many solutions.&lt;br&gt;Learning Goals:</td>
<td>Students will solve linear equations in one variable with rational number coefficients and simplify expressions through combining like terms and the distributive property. Students will also get an opportunity to categorize linear equations in one variable as having one, none, or infinitely many solutions.</td>
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b). Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form \( x = a, \ a = a, \) or \( a = b \) results (where \( a \) and \( b \) are different numbers).

- 8.PAR.3.3 Create and solve linear equations and inequalities in one variable within a relevant, real-life application.

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<tr>
<td>1.</td>
<td>I can solve linear equations in one variable with rational number coefficients.</td>
</tr>
<tr>
<td>2.</td>
<td>I can simplify expressions through combining like terms and the distributive property.</td>
</tr>
<tr>
<td>3.</td>
<td>I can categorize linear equations in one variable as having one, none, or infinitely many solutions.</td>
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**Content Resources**

- Savvas Math 8 Correlation Document (see pgs. 8 - 12)

**Savvas Lessons**

- Lesson 2-1 (Combine Like Terms to Solve Equations)
- Lesson 2-2 (Solve Equations with Variables on Both Sides)
- Lesson 2-3 (Solve Multi-Step Equations)
- Lesson 2-4 (Equations with No Solutions and Infinitely Many Solutions)

**Intervention Resources**

- Balancing Act - Form and solve simple linear equations. Interpret expressions

**Additional Resources:**

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