Accelerated Grade 7/8 Mathematics

Unit title	Unit 3: Investigating LInear Expressions, Equations, and Inequalities in One Variable	MYP year	3	Unit duration (hrs)	*MMS- (4.5 hours per week)* *18 hrs*

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 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.

Strand 2: Creative Thinking SkillsStudents will develop and utilize creative thinking through a variety of products and problem solving.
Strand 3: Higher OrderThinking 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.

	Expectations	Evidence of Student Learning (not all inclusive; see Grade Level Overview for more details)		
8.PAR.3.1	Interpret expressions and parts of an expression, in context, by utilizing 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.
8.PAR.3.2	Describe and solve linear equations in one variable with one solution ($x = a$), infinitely many solutions ($a = a$), or no solutions ($a = b$). 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).	**Strategies and Methods** • Students should use algebraic reasoning in their descriptions of the solutions to linear equations. • 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.		
8.PAR.3.3	Create and solve linear equations and inequalities in one variable within a relevant application.	**Strategies and Methods** • Students should use algebraic reasoning in their descriptions of the solutions to linear equations. • Include linear equations and inequalities with rational number coefficients and whose solutions require expanding expressions using the distributive property and collecting like terms.		
8.PAR.3.4	Using algebraic properties and the properties of real numbers, justify the steps of a one-solution equation or inequality.	**Strategies and Methods** • Students should justify their own steps, or if given two or more steps of an equation, explain the progression from one step to the next using properties.		
8.PAR.3.5	Solve linear equations and inequalities in one variable with coefficients represented by letters and explain the solution based on the contextual, mathematical situation.	**Strategies and Methods** • Students should use algebraic reasoning to solve linear equations and inequalities in one variable.		**Example** • Given $ax + 3 = 7$, solve for x.
8.PAR.3.6	Use algebraic reasoning to fluently manipulate linear and literal equations expressed in various forms to solve relevant, mathematical problems.	**Strategies and Methods** • To achieve fluency, students should be able to choose flexibly among methods and strategies to solve mathematical problems accurately and efficiently. • Students should rearrange formulas to highlight a quantity of interest using the same reasoning as in solving equations. Interpret and explain the results.		**Example** • Find the radius given the formula $V = \pi r^2 h$ by rearranging the equation to solve for the radius, r.

Concepts/Skills to support mastery of standards

8.PAR.3.1 Interpret and utilize formulas or expressions.

8.PAR.3.2 Describe and solve linear equations in order to demonstrate a simpler form of equivalent equations.

8.PAR.3.3 Create and solve linear equations and inequalities for application.

8.PAR.3.4 Applying algebraic properties in order to justify steps for one-solution equations and inequalities.

8.PAR.3.5 Solve linear equations and inequalities in one variable, and explain the contextual meaning in a scenario.

8.PAR.3.6 Apply algebraic reasoning in various forms to solve linear and literal equations.

Vocabulary

Algebraic properties	Inverse Operations	Coefficients	Linear Equation	Equation	Linear Inequality
Equivalent Equation	Literal Equation	Expression	Terms	Factors	Variable

K12 Mathematics Glossary

Notation

Key concept	Related concept(s)	Global context
Relationships The connections and associations between properties, objects, people and ideas.	Model Representation	Globalization and sustainability

Statement of inquiry
Modeling the change in relationships can impact decision-making

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?

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: (Knowledge and Understanding) *Criteria B (Investigating Patterns)* *Criteria C: (Communication)* *Criteria D Applying Mathematics in real life contexts*	Students will interpret real life scenarios to enhance their understanding of patterns.	**Formative Assessment(s):** ● **Unit 3 CFA** **Summative Assessment(s):** ● Unit 3 Summative Assessment ● Unit 3 Retake/Retest MYP Assessment: **Savvas Alg. 1 Topic 1: Performance Assessment Form A**

Approaches to learning (ATL)

Category: Social   **Cluster:** Collaboration Skills   **Skill Indicator:**   Give and receive meaningful feedback.   **Category:** Thinking   **Cluster:** Creative Thinking Skills   **Skill Indicator:**   Draw reasonable conclusions and generalizations.

Learning Experiences		

Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
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.PAR.3.1 Interpret and utilize formulas or expressions. ● 8.PAR.3.4 Applying algebraic properties in order to justify steps for one-solution equations and inequalities. ● 8.PAR.3.5 Solve linear equations and inequalities in one variable, and explain the contextual meaning in a scenario.	Jaden's Phone Plan https://lor2.gadoe.org/gadoe/file/91b44ffc-3321-45e7-9f17-8a749d8fedd4/1/Jadens-Phone-Plan-Recording-Sheets.pdf (Student Document) **https://lor2.gadoe.org/gadoe/file/91b44ffc-3321-45e7-9f17-8a749d8fedd4/1/Jadens-Phone-Plan.pdf (Teachers Guide)**	In this task, students will solve a series of linear equations word problems to help Jaden choose a cell phone plan. To help Jaden, students must explain in detail each step of the problem and justify the answer
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.PAR.3.2 Describe and solve linear equations in order to demonstrate a simpler form of equivalent equations. ● 8.PAR.3.3 Create and solve linear equations and inequalities for application. ● 8.PAR.3.4 Applying algebraic properties in order to justify steps for one-solution equations and inequalities.	Smallest Solutions https://lor2.gadoe.org/gadoe/file/778c244b-f7a2-4890-935f-17bf4ef63489/1/Smallest-Solution-Recording-Sheets.pdf (Student Document) https://lor2.gadoe.org/gadoe/file/778c244b-f7a2-4890-935f-17bf4ef63489/1/Smallest-Solution.pdf (Teachers Guide)	In this activity, students will practice solving equations with multiple steps and with variables on both sides of the inequality. They will create an equation so that it has the "smallest" possible solution for x. Students will reason abstractly and structurally, arguing that their expressions are the greatest or least possible.

| 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.PAR.3.1 Interpret and utilize formulas or expressions.
● 8.PAR.3.5 Solve linear equations and inequalities in one variable, and explain the contextual meaning in a scenario.
● 8.PAR.3.6 Apply algebraic reasoning in various forms to solve linear and literal equations. | Moving Things Around
https://lor2.gadoe.org/gadoe/file/da80e6a3-0e07-4f51-9598-ceb0f9607485/1/Moving-Things-Around-Recording-Sheets.pdf (Student Document)

https://lor2.gadoe.org/gadoe/file/da80e6a3-0e07-4f51-9598-ceb0f9607485/1/Moving-Things-Around.pdf (Teacher Guide) | In this task, students will look for structure in algebraic expressions using the context of a trucking company which has two different-sized trucks to deliver concrete blocks and manipulate equations that contain just variables. |

Content Resources

Intervention Resources

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

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)