# Unit 1: First Degree Equations and Inequalities

Content Area: **Mathematics**
Course(s): **Algebra 2H**
Time Period: **September**
Length: **3 weeks**
Status: **Published**

## Unit Overview

- Represent and analyze mathematical situations using algebraic symbols.
- Simplify Algebraic Expressions and solve equations/inequalities of one variable.
- Solve and Apply Conjunctions and Disjunctions.
- Understand and Apply Absolute Value.
- Understand numbers, ways of representing numbers, relationships among numbers and number systems.

## Enduring Understandings

- Absolute value inequalities can be solved graphically or by using a compound statement.
- Real-world problems can be interpreted, represented, and solved
- Regardless of the method used, the answer will always come out the same
- The definition of absolute value (for any real numbers a and b, where b ≥ 0, if a b = , then a = b or a = -b) is used in solving absolute value equations and inequalities.
- The order in which you simplify an equation will impact the answer
- There is more than one way to solve a problem

## Essential Questions

- How can formulas be used in everyday life?
- How can linear equations be used to understand real-world data?
- How does it facilitate problem solving?
- Why is Algebra a universal language?

## Student Learning Objectives

- SWBAT calculate the slope of a linear equation
- SWBAT graph linear equations/inequalities
- SWBAT simplify numerical expressions using Order of Operations
- SWBAT solve absolute value equations/inequalities and compound inequalities
- SWBAT solve multivariable equations/inequalities through the use of systems of equations/inequalities
- SWBAT solve single variable equations and inequalities

- SWBAT write linear equations given two pieces of information

## Lesson Titles

- Graphing linear equations and inequalities
- Solving absolute value equations and inequalities
- Solving and graphing compound inequalities
- Solving systems of equations and inequalities

## Standards

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| MA.K-12.2 | Reason abstractly and quantitatively. |
| MA.K-12.6 | Attend to precision. |
| MA.A-CED | Creating Equations |
| MA.A-CED.A | Create equations that describe numbers or relationships |
| MA.A-REI | Reasoning with Equations and Inequalities |
| MA.A-REI.A | Understand solving equations as a process of reasoning and explain the reasoning |
| MA.A-REI.B | Solve equations and inequalities in one variable |
| MA.A-REI.B.4 | Solve quadratic equations in one variable. |
| MA.A-REI.D | Represent and solve equations and inequalities graphically |

## Indicators

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| MA.A-CED.A.1 | Create equations and inequalities in one variable and use them to solve problems. |
| MA.A-CED.A.2 | Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. |
| MA.A-CED.A.3 | Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. |
| MA.A-CED.A.4 | Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. |
| MA.A-REI.A.1 | Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. |
| MA.A-REI.C.6 | Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. |
| MA.A-REI.D.11 | Explain why the $x$-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. |

## Career Readiness, Life Literacies & Key Skills

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| TECH.9.4.2.CI.1 | Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2). |
| TECH.9.4.2.CI.2 | Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a). |
| TECH.9.4.2.CT.2 | Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3). |
| TECH.9.4.2.CT.3 | Use a variety of types of thinking to solve problems (e.g., inductive, deductive). |
| TECH.9.4.2.DC.3 | Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4). |
| TECH.9.4.2.TL.2 | Create a document using a word processing application. |
| TECH.9.4.2.TL.3 | Enter information into a spreadsheet and sort the information. |

## Alternate Assessment

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

## Inter-Disciplinary Connections

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| LA.RST.11-12.9 | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| LA.W.9-10.6 | Use technology, including the Internet, to produce, share, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| 9-12.HS-ETS1-4.5 | Using Mathematics and Computational Thinking |

## Instructional Strategies/Learning Activities/Levels of Blooms

- Intro. combined inequaliites and their solution sets.
- Intro. problem solving using equations of lines and equations of parallel and perpendicular lines
- Intro. Solutions to Absolute value equations.
- intro. Solving  Combined inequalities.
- Intro. Solving Absolute value equations.
- Intro. Solving Absolute value equations.
- intro. Solving Problems by using Combined inequalities.

- intro. writing combined inequalities to represent the problems.
- Partner Activity: students will work on various problems with a partner.
- Review Anticipatory Set
- Review increments
- Review Quiz
- Review SAT warmup
- Review slope
- Review slopes of parallel and perpendicular lines
- students will be randomly selected to discuss how to solve the problems.
- Students will place solutions to guided practice on the board

## Benchmark Assessment

Skills-based assessment- math practice

## Modifications

## ELL Modifications

- • Assess ELL students continuously using formative assessment methods
- • Be flexible with time frames and deadlines
- • During Delsea One - one on one with a student who speaks the same language
- • Intentional scheduling/grouping with student/teacher who speaks the same language if possible
- • Khan Academy offers lesson in several languages https://es.khanacademy.org/
- • Offer resources for specific topics in primary language (Youtube web resources)
- • Repeat, reword, clarify
- • Use google translator, especially for application problems
- • Using technology, such as but not limited to: graphing calculator and desmos

## IEP & 504 Modifications

- • Allowing co-teaching with general education and special education teachers in the same classroom so that the special education teacher can re-teach students with special needs in a different way in a smaller group (pulled to the side)
- • For assessments - allowing student to correct mistakes or answer wrong questions correctly for additional credit if failed the first test (another way to re-teach material)

- For assessments - rewording questions so that there are not higher level vocabulary within the question (you are testing for understanding of the content not the ability to understand the question)
- For assessments - students could use calculator and/or other math tools (x grids, chips, ect)
- If not in a co-teaching setting allowing time in the schedule for a special education teacher to consult with general education teachers on what specifically can be modified or how to paraphrase things in a different way specific to that lesson
- Khan Academy offers extra practice and examples in all areas. https://www.khanacademy.org/
- Modeling and showing lots of examples
- Non-verbal redirection of behaviors
- Providing study guides that don't lead the student to study too much extraneous information (less unnecessary details)/scaffolded study guides
- Scaffolded notes
- Speaking to students privately when redirecting behaviors
- Videos that offer extra practice and examples in all areas are posted on google classroom and taken from: mathispower4u

## G & T Modifications

- Determine where students' interests lie and capitalize on their inquisitiveness. (Is there a Invite students to explore different points of view on a topic of study and compare the two.
- Encourage students to explore concepts in depth and encourage independent studies or investigations.
- Invite students to explore different points of view on a topic of study and compare the two.
- Math- provide additional rigorous challenge problems for advanced students
- Refrain from having them complete more work in the same manner.
- Specific career they are interested in? How would this apply to their interest?)

## At Risk Modifications

- Keep contact with parents/guardians and guidance counselor about class progress
- Refer to organizational management
- Require Delsea One tutoring

## Formative Assessment

- Anticipatory Set
- Closure
- Group Work
- Partner answer/analyze question
- Pass out of class
- Quiz on Functions

- Quiz on Systems of Equations and Inequalities
- Teacher Observation
- Warm Up

## Summative Assessment

- Benchmark Assessment
- Marking Period Assessment
- Unit Test on Systems of Equations and Inequalities

## Resources & Materials

- Algebra and Trigonometry Book 2
- Establish a set of general strategies for student independence and self-evaluation
- Evoke student participation from their seats and at the board
- Graphing Calculator acitivities
- Independent/Cooperative learning explorations
- Mathispower4u videos on google classroom
- mathxlforschool.com
- Powerpoint lessons
- Smartboard Lessons
- Teacher Generated Worksheets
- Use youtube  videos to introduce/demonstrate concepts in real-life situations.

## Technology

- Chromebooks
- Desmos
- Equatio
- Graphing Calculator
- MathXLforschool.com

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| TECH.9.4.2.TL.1 | Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1). |
| TECH.9.4.2.TL.2 | Create a document using a word processing application. |
| TECH.9.4.2.TL.3 | Enter information into a spreadsheet and sort the information. |