

Curriculum Units and Learning Outcomes

Content Area: Foundations Algebra I	Grade Level: 9
Unit 4: Solve Advanced One Variable Equations and Graphing Lines	
Unit Summary: In this unit, students will continue solving one variable equations then ultimately solve literal equations with several variables. Next, students graph and write equations of lines in all forms. Lastly, students will see how linear relations are modeled through tables of data, and equations. They will also learn about rates of change in a data set and how to find equation characteristics to identify linear relationships. Function notation is introduced.	
Massachusetts Standards: ● A.CED.2, 3 2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales 3. Represent constraints by linear equations or inequalities, and by systems of linear equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. ● A.REI.3, 10 3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. 10: Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). Show that any point on the graph of an equation in two variables is a solution to the equation. ● F.BF.1a, 4, 6, 7a 1.a. Determine an explicit expression, a recursive process, or steps for calculation from a context 4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; and end behavior 6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. 7.a. Graph linear and quadratic functions and show intercepts, maxima, and minima	

- **F.LE.5**

5. Interpret the parameters in a linear or exponential function (of the form $f(x) = bx + k$) in terms of a context.

- **N.Q.1**

1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

Enduring Understandings:

- The properties of algebra and rules of arithmetic can be used to solve equations.
- Equations of lines can be graphed using multiple methods
- Equations of lines can be written in many forms using many types of given information

Essential Questions:

- How do you solve equations in one variable?
- How do you rearrange a literal equation and evaluate it?
- How do you graph a line?

Students will demonstrate KNOWLEDGE of:

- Determine slope using a “slope triangle”
- Using the slope formula to calculate the slope of a line
- The different forms of two variable equations and how to solve and graph using each.
- Writing equations of lines in different forms
- Solving applications using forms of slope

Students will be SKILLED at:

- Solving equations for given variables.
- Solve literal equations for an indicated variable
- Using formulas to solve real-world problems/applications.
- Using rate of change to solve problems.
- Finding the slope of a line.
- Writing Equations of Lines in all forms (Slope-intercept Form, Point-slope Form, Standard Form, and with a point and an equation of a parallel or perpendicular line) from a table, graph, or given information.
- Identifying linear equations and intercepts.
- Graphing Linear Equations in all forms

Estimated Duration: 4 weeks