

Mathematics
Topics in Algebra and Geometry
Unit 4: Graphing Linear Equations and Functions

Essential Understandings	<ul style="list-style-type: none"> ▪ Graphing linear equations and functions is a major skill necessary for Algebra I.
Essential Questions	<ul style="list-style-type: none"> ▪ How do you plot points on a coordinate plane? ▪ How do you graph points using a table? ▪ What are intercepts of lines and how do you use them? ▪ What is slope? ▪ How do you graph using the slope-intercept form of an equation? ▪ What are functions?
Essential Knowledge	<ul style="list-style-type: none"> ▪ The coordinate plane has an x-axis and a y-axis. ▪ The coordinate plane is divided into four quadrants. ▪ Points are graphed on the coordinate plane using an ordered pair. ▪ Ordered pairs are in the form (x,y). ▪ Slope means rate of change. ▪ The y-intercept is the point where the graph of a linear function intercepts the y-axis. This point is found by substituting zero for x in the function. ▪ The x-intercept of a linear function is the point at which the graph of the function intercepts the x-axis. This point is found by setting y equal to zero and solving the equation. ▪ The slope-intercept form is represented by $y=mx + b$; where m represents the slope and b represents y-intercept. ▪ A function is a set of ordered pairs (x, y) for which there is never more than one value of y for any given value of x.
Vocabulary	<ul style="list-style-type: none"> ▪ <u>Terms:</u> <ul style="list-style-type: none"> ○ ordered pairs, linear equations, slope intercepts, coordinate plane, function, quadrant, ordered pair, rate of change
Essential Skills	<ul style="list-style-type: none"> ▪ Identify the x-axis, y-axis and quadrants in a coordinate plane. ▪ Plot points in a coordinate plane. ▪ Graph points using a table. ▪ Find the intercepts of a line algebraically and graphically. ▪ Find slope of a line algebraically and graphically. ▪ Graph equations using the slope-intercept form. ▪ Identify whether relationships are functions or not.

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Related Maine Learning Results	<p><u>Mathematics</u> Functions and Relations D4.Students understand and interpret the characteristics of functions using graphs, tables, and algebraic techniques.</p> <ol style="list-style-type: none"> a. Recognize the graphs and sketch graphs of the basic functions. b. Apply functions from these families to problem situations. c. Use concepts such as domain, range, zeros, intercepts, and maximum and minimum values. d. Use the concepts of average rate of change (table of values) and increasing and decreasing over intervals, and use these characteristics to compare functions.
Sample Lessons And Activities	<ul style="list-style-type: none"> ▪ Students will utilize graphing calculators to explore the properties of linear functions through both teacher demonstration and exploration.
Sample Classroom Assessment Methods	<ul style="list-style-type: none"> ▪ Students will be given a quiz that requires the use of a graphing calculator to answer the questions.
Sample Resources	<ul style="list-style-type: none"> ▪ <u>Publications:</u> <ul style="list-style-type: none"> ○ <u>Algebra 1 Textbook</u> (McDougal Littell)