Linear Equations

Students who study linear equations are learning to answer the questions

What effect does changing this variable have on that variable?

How can this data be used to represent a general relationship between these two variables?

What is the most useful form in which to represent the relationship between these two variables?

This unit of study addresses Indiana College & Career Ready Standards as follows:

8.AF.5: Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. Describe similarities and differences between linear and nonlinear functions from tables, graphs, verbal descriptions, and equations.

8.AF.6: Construct a function to model a linear relationship between two quantities given a verbal description, table of values, or graph. Recognize in y = mx + b that m is the slope (rate of change) and b is the y-intercept of the graph, and describe the meaning of each in the context of a problem.

AI.L.4: Represent linear functions as graphs from equations (with and without technology), equations from graphs, and equations from tables and other given information (e.g., from a given point on a line and the slope of the line).

AI.L.5: Represent real-world problems that can be modeled with a linear function using equations, graphs, and tables; translate fluently among these representations, and interpret the slope and intercepts.

AI.L.6: Translate among equivalent forms of equations for linear functions, including slope-intercept, point-slope, and standard. Recognize that different forms reveal more or less information about a given situation.

AI.L.7: Represent real-world problems using linear inequalities in two variables and solve such problems; interpret the solution set and determine whether it is reasonable. Solve other linear inequalities in two variables by graphing.

Gaining skills in this unit will enable students to do everyday tasks like making projections on a budget or mapping out a weight-loss program. The specific skills in this unit of study include

- graphing ordered pairs
- graphing linear equations using points
- graphing linear equations using intercepts
- calculating slope
- graphing linear equations using slope-intercept form
- writing equations of lines given a slope and an intercept
- writing equations of lines given a slope and a point
- writing equations of lines given two points
- using point-slope form
- using standard form
- using parallel and perpendicular lines
- writing linear models
- graphing linear inequalities