# Unit 3 Vocabulary

**linear relationship**

A linear relationship is a relationship between two quantities where one quantity has a constant rate of change with respect to the other. The relationship is called linear because its graph is a line. A linear relationship can be represented by an equation of the form $y = mx + b$, where $m$ and $b$ are constants.

You start 5 miles from home and walk at a constant speed of 2 miles per hour towards your home. The relationship between your distance from home in miles, $d$, and the time you have been walking in hours, $t$, is a linear relationship given by the equation $d = 5 - 2t$. The rate of change is -2 miles per hour.

**rate of change**

In a linear relationship between two quantities $x$ and $y$, with equation $y = mx + b$, the constant $m$ is the rate of change. It tells you how much $y$ changes when $x$ changes by 1. It is also the slope of the graph of the relationship.

The rate of change of the population of sea otters was 4 otters per year, and the relationship between the population $P$ and the time $t$, in years, since the population started being measured is modeled by the equation $P = 100 + 4t$.

**solution to an equation with two variables**

A solution to an equation with two variables is any pair $(x, y)$ that can be used in place of the variables to make the equation true.

In the equation $4x + 3y = 24$, one possible solution is $(6, 0)$, because $4(6) + 3(0) = 24$ is true. Some other possible solutions are $(-6, 16)$, $\left(\frac{3}{4}, 7\right)$, and $(0, 8)$.

**vertical intercept**

The vertical intercept of a graph is the point where the graph crosses the vertical axis. If the axis is labeled with the variable $y$, the vertical intercept is also called the $y$-intercept. Also, the term is sometimes used to mean just the $y$-coordinate of the point where the graph crosses the vertical axis.

The vertical intercept of the graph of $y = 3x - 5$ is $(0, -5)$, or just -5.