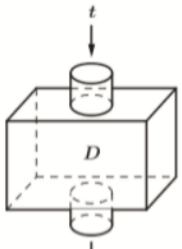
Module 5, Topic A, Vocabulary

Average rate of change: The average change of one quantity in relation to a second quantity. For example, we rarely walk at a constant rate—we stop at crosswalks, speed up to cross the street, etc.—but we can calculate the average rate of change for a trip by dividing the total distance walked by the time it took to complete the trip.

Discrete: The input (usually the x-value) is restricted to certain values such as integers or whole numbers. For example, if the input is *number of people,* the function is discrete because people can only be represented by whole numbers.

Function: An assignment of exactly one output for each and every input. In the image, the input is t seconds, and the function, D, manipulates t in some way (often according to an equation) and outputs a distance traveled after t seconds.



Distance traveled in t seconds

Graph of a function: The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. The set represents the solution set of the function. For example, in the simple function *multiply by 5*, the set of ordered pairs to graph would include (–2, –10), (–1, –5), (0, 0), (1, 5), (2, 10), (3, 15), and so on.

Linear function: A set of ordered pairs that can be represented by the equation $y = mx + b$ and graphs as a straight line.

Nonlinear function: A set of ordered pairs that graphs as something other than a straight line.

Not discrete: A function in which the input (usually the x-value) can be any value, including fractions, decimals, and negative numbers. For example, a function with temperature as its input is not discrete because temperatures can have positive, negative, and decimal values (e.g., $42.5°$ or $-6°$).

Rate of change: The rate at which one quantity (e.g., distance traveled) changes in relation to another quantity (e.g., time spent traveling). The rate of change of a linear function is the slope of the graph of a line. In most real-world situations, we identify the average rate of change.

Restrictions on a variable: Some functions represent real-world situations and have restrictions on which numbers or types of numbers they can represent. For example, a variable that represents a number of people cannot be a fraction or a negative number.

Module 5, Topic B, Vocabulary

Base/Base shape: The two-dimensional shape that is stacked upon itself to create the three-dimensional object. For example, a stack of circles forms a cylinder.

Solids: Three-dimensional figures such as cylinders, cones, rectangular prisms (boxes), and spheres.

Volume: The amount of space inside a three-dimensional object such as a cone or sphere. Volume is measured in cubic units.

Volume formulas: The general formula is $V = Bh$ where V represents the volume of the solid, B represents the area of the base shape, and h represents the height of the solid. Since the base is a circle in the following solids, $B = \pi r^2$, where r is the radius of the circle.

The equation for finding the volume of a cylinder is $V = \pi r^2 h$.

The equation for finding the volume of a cone is $V = \frac{1}{3}\pi r^2 h$.

The equation for finding the volume of a sphere is $V = \frac{4}{3}\pi r^3$.