

KEY CONCEPT OVERVIEW

In this topic, students continue to investigate **functions** by connecting a context (word problem) to a set of ordered pairs that model the function at certain inputs. These ordered pairs are then organized in tables and graphs that visually represent the functions. Students discover the relationship between **slope** and rate of change as well as between the y -intercept point and the **initial value** of linear functions. Further investigation leads to determining whether a function represents an **increasing, decreasing, or constant** relationship. Students close this topic by using graphs and verbal descriptions to explore nonlinear functions.

To LEARN MORE by viewing a video about graphing functions, visit eurmath.link/graph-functions.

You can expect to see homework that asks your child to do the following:

- Construct or interpret a table of values, a graph, or an equation that models a linear function.
- Interpret the meaning of values from equations, tables, or graphs in the context of a verbal description.
- Identify which function has a faster rate, steeper slope, or better value.
- Determine the **rate of change** and initial value of a function based on a variety of representations.
- Determine whether a function represents an increasing, decreasing, or constant relationship.
- Explore nonlinear functions by using graphs and verbal descriptions.

SAMPLE PROBLEM (From Lesson 3)

Based on the verbal description, create a table, a graph, and an equation.

Verbal Description	Table of Values	Graph	Equation														
A truck rental company charges a \$150 rental fee in addition to a charge of \$0.50 per mile driven. Allow C to represent the total cost of the rental in dollars and m the number of miles driven.	<table border="1"> <thead> <tr> <th>Miles Driven</th> <th>Total Cost, in dollars</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>150</td> </tr> <tr> <td>200</td> <td>250</td> </tr> <tr> <td>400</td> <td>350</td> </tr> <tr> <td>600</td> <td>450</td> </tr> <tr> <td>800</td> <td>550</td> </tr> <tr> <td>1000</td> <td>650</td> </tr> </tbody> </table>	Miles Driven	Total Cost, in dollars	0	150	200	250	400	350	600	450	800	550	1000	650	<p style="text-align: center;">Truck Rental Cost Per Miles Driven</p>	$C = 150 + 0.50m$
Miles Driven	Total Cost, in dollars																
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Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

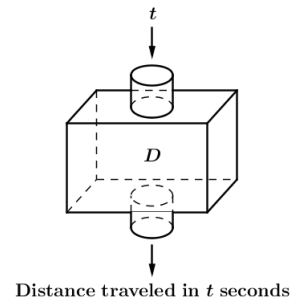
HOW YOU CAN HELP AT HOME

You can help at home in many ways. Here are some tips to help you get started.

- Describe situations that can be represented by an increasing, decreasing, or constant linear function. Have your child determine which type of function represents each situation. For example, slowing your car or withdrawing money from your bank account at a constant rate can both be represented by a decreasing linear function. Speeding up or depositing money at a constant rate can both be represented by an increasing linear function. If your car is not moving, or there has been no change in your bank account, a constant linear function represents the situation.
- Use your child’s lesson materials to find examples of linear functions represented as tables of values, graphs, verbal descriptions, and equations. Put each representation on a separate index card. Shuffle the cards, and have your child organize them into stacks according to the linear function each card models.

TERMS

Function: An assignment of exactly one output for each and every input. In the image on the right, 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. For example, if the input, t , represents 50 seconds, and the function multiplies t by 2 meters per second, then the output would be 100 meters.



Initial value: The starting value in a context, often represented by the y -intercept of a graph, which is the value of y where a line intersects the y -axis.

Rate of change: How one quantity changes in relation to another (e.g., miles per hour or price per pound). This is often represented as the slope of a line.

Slope: A number that describes the steepness or slant of a line.

Constant linear function: A function whose graph has a zero slope. It appears as a horizontal line. (See image at right.)

Decreasing linear function: A function whose graph has a negative slope. It appears as a line that tilts downward from left to right across the graph. (See image at right.)

Increasing linear function: A function whose graph has a positive slope. It appears as a line that tilts upward from left to right across the graph. (See image at right.)

