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LEARNING OBJECTIVE: We will look at constant rates using two variables and graph points related to constant rate problems. (G8M4L10)

CONCEPT DEVELOPMENT:

When we express a constant rate as a relationship between two variables, we can create **tables** to show the relationship and **graph** this relationship on a coordinate plane.

Example: Pauline mows a lawn at a constant rate. Suppose she mows 35 square feet in 2.5 minutes. How many square feet can she mow in *x* minutes?

Equation in 2 variables:

$\frac{y}{x} = \frac{35}{2.5}$

$y = \frac{35}{2.5} x$

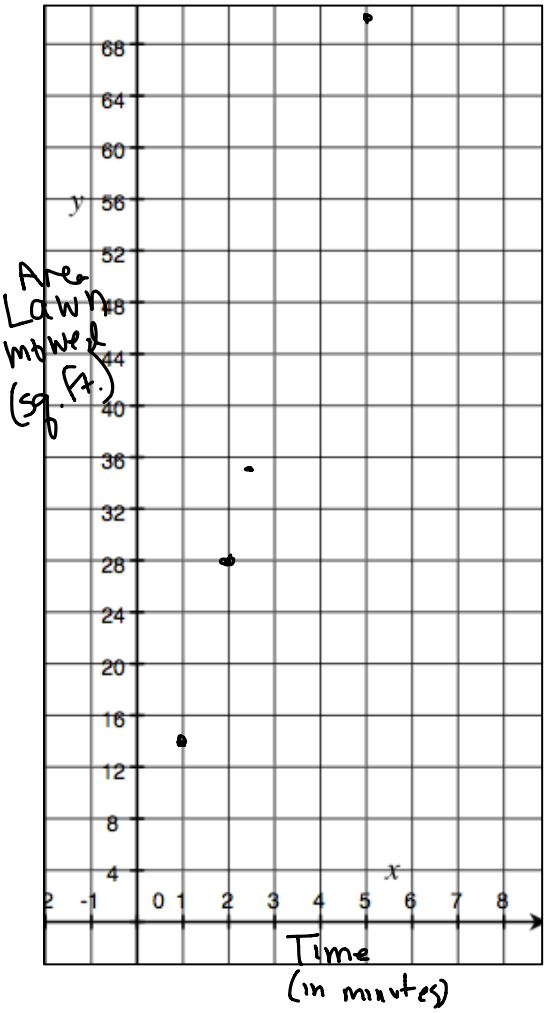
$y = 14x$

Pauline mows 14 sq. ft. per minute

Table:

Time (in minutes x)	Equation: $y = 14x$	Lawn mowed (in sq. feet) y
2.5	$y = 14(2.5)$	35
5	$y = 14(5)$	70
10	$y = 14(10)$	140
1	$y = 14(1)$	14

Graph:



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Guided Practice:

Steps for Expressing Rates as Equations, Tables and in Graphs

1. Begin by creating a linear equation using 2 variables that includes the rate.
2. Create a table and fill in the values.
3. Label and create a graph based on the table of values.

Water leaks out of a faucet at a constant rate. In 4 minutes, 35 milliliters of water dripped out. How many milliliters of water leak out in *x* minutes?

Linear Equation (in two variables)

$x\left(\frac{y}{x}\right)=\left(\frac{35}{4}\right)x$

$y=\frac{35}{4}x$

$y=8.75x$

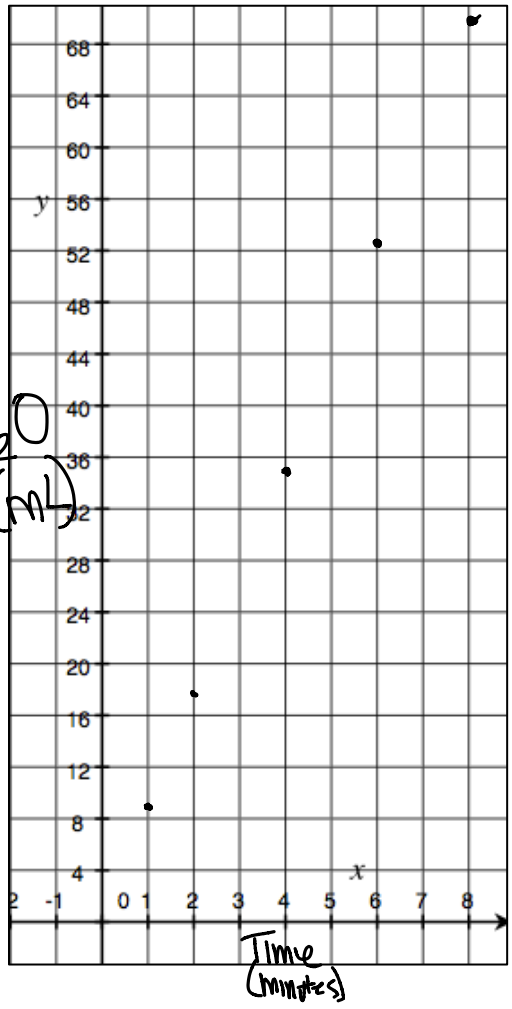

Table of values

Time (in minutes) x	Linear equation $y=8.75x$	Water (in mL) y
1	$y=8.75(1)$	8.75
2	$y=8.75(2)$	17.50
4	$y=8.75(4)$	35.00
6	$y=8.75(6)$	52.50
8	$y=8.75(8)$	70.00

The faucet leaks at a rate of 8.75 mL per minute.

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Kaia has a part time job as a babysitter. She worked last Friday evening and earned $32.50 for working 2.5 hours. How much money would she earn in *x* hours?

Linear Equation (in two variables)

$$\frac{y}{x} = \frac{32.5}{2.5}$$

$$y = \frac{32.5}{2.5}x$$

$$y = 13x$$

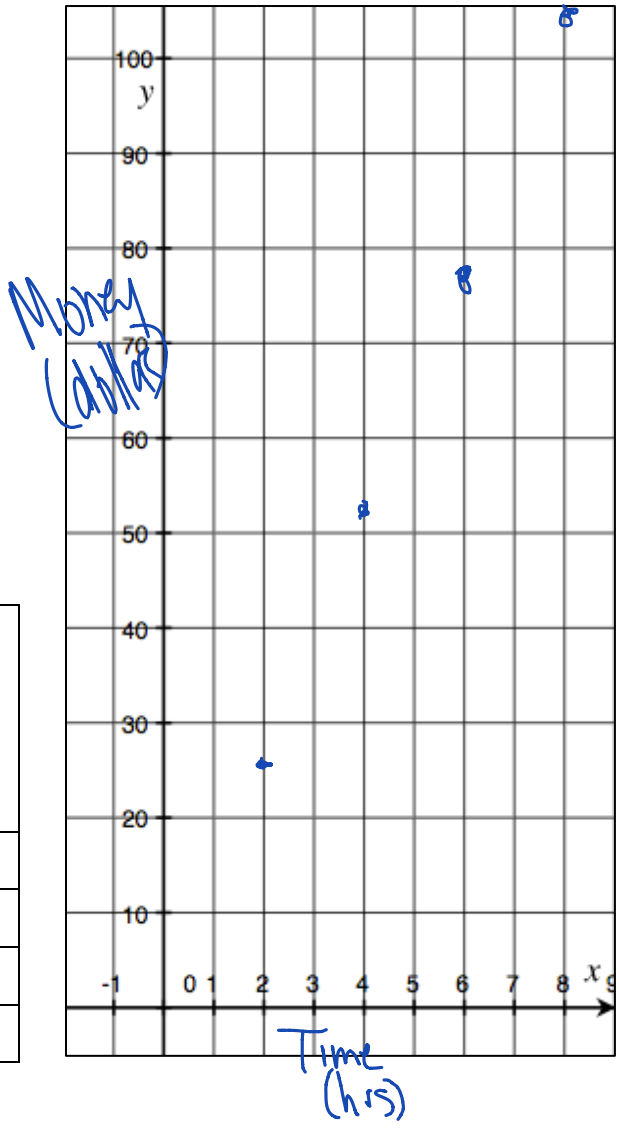

Table of values

Time (in hours) x	Linear Equation y = 13x	Money earned (in dollars) y
2	y = 13(2)	26
4	y = 13(4)	52
6	y = 13(6)	78
8	y = 13(8)	104

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Lucas types at a constant rate. He can type one full page of text in $3\frac{1}{2}$ minutes. How many pages can type in *x* minutes?

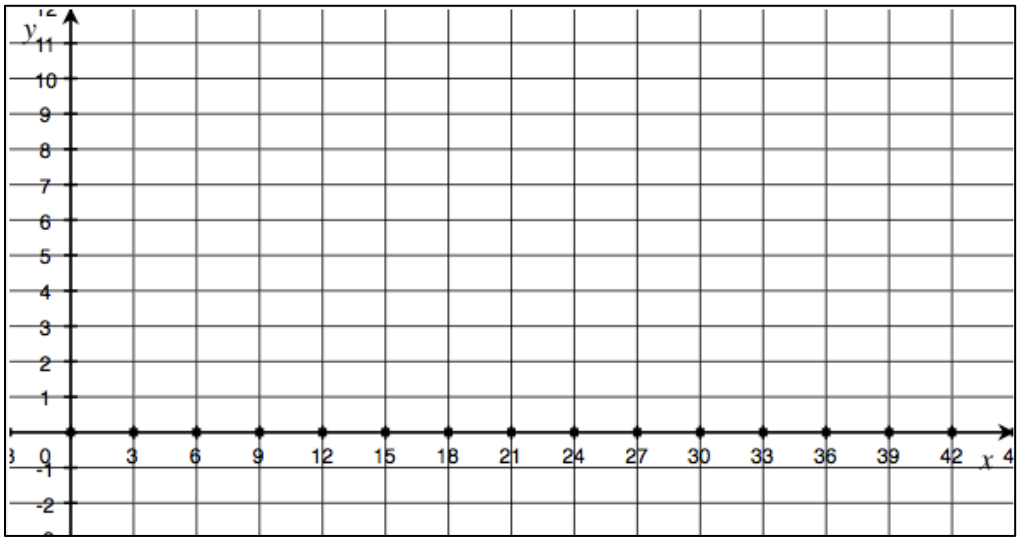
Linear Equation (in two variables)

$$\frac{y}{x} = \frac{1}{3.5}$$

$$y = \frac{2}{7}x$$

Table of Values

Time (in minutes) x	Linear Equation $y = \frac{2}{7}x$	Pages typed y
1	$y = \frac{2}{7}(1)$	$\frac{2}{7}$
9	$y = \frac{2}{7}(9)$	$\frac{18}{7} = 2\frac{4}{7}$
18	$y = \frac{2}{7}(18)$	$\frac{36}{7} = 5\frac{1}{7}$
27	$y = \frac{2}{7}(27)$	$\frac{54}{7} = 7\frac{5}{7}$
36	$y = \frac{2}{7}(36)$	$\frac{72}{7} = 10\frac{2}{7}$



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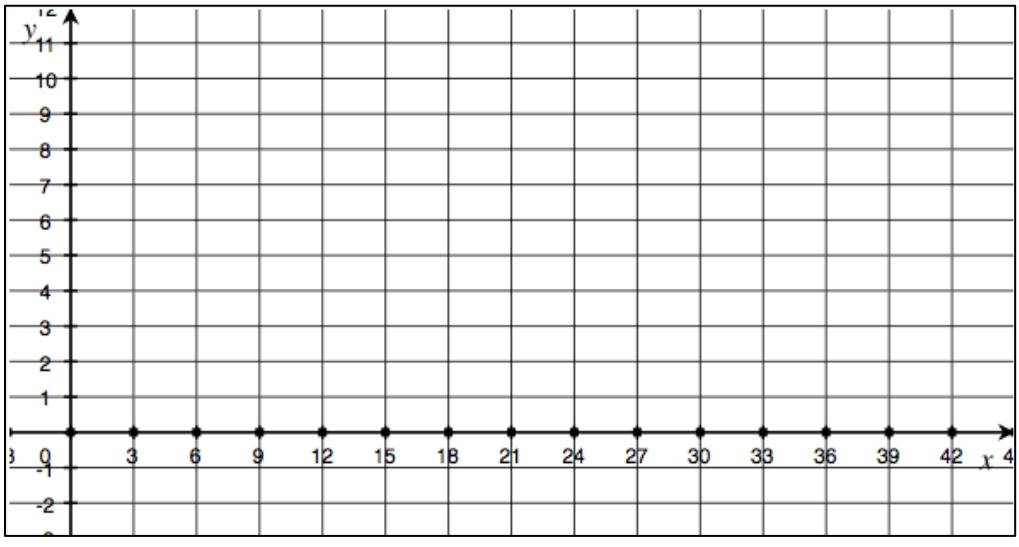
Rachel loves to read. She loves reading so much that she reads 4 books every 15 days. How many books can she read in *x* days?

Linear Equation (in two variables)

Table of Values

Time (in days)	Linear Equation	Books read
10		
20		
30		
40		



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Independent Practice:

Activating Prior Knowledge:

Closure:

Teacher Notes:

Lesson 11 from ENY Module 4, Grade 8. Can also give the Yummy Math light bulbs activity as independent practice.
Homework is Lesson 11 problem set.