

Track the Change

Use equations, tables, and graphs to show changing quantities.

GRADE 6 • 6.EE.C.9

CCSS.Math.Content.6.EE.C.9 "Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity..."

NAME _____

DATE _____

SHOW THE RELATIONSHIP

A dependent quantity changes because the independent quantity changes. Use the independent quantity as the input, then write an equation that tells how to find the dependent quantity. A table and graph show the same relationship, with each row written as an ordered pair, input first and output second.

WORKED EXAMPLE

A music app downloads 11 songs each minute. Let t be the number of minutes and s be the number of songs. Write an equation and find s when $t = 2$.

1. Let t = minutes and s = songs.
2. The app downloads 11 songs each minute, so $s = 11t$.
3. Substitute $t = 2$: $s = 11(2) = 22$.

Answer: $s = 11t$; 22 songs

PRACTICE 6 problems

- 1** A craft club makes 5 bracelets per hour. Let h be the number of hours and b be the number of bracelets. Write an equation.

ANSWER _____

- 2** A video game gives 6 coins for each level completed. The equation is $c = 6l$. Complete the table for $l = 0, 1$, and 3 .

ANSWER _____

- 3** A tank fills according to $v = 4m$, where m is the number of minutes and v is the liters of water. Which variable is dependent, and what does it represent?

ANSWER _____

- 4** The equation is $y = 9x$. For $x = 0, 1$, and 3 , list the ordered pairs you would plot on a graph.

ANSWER _____

- 5** A concert hall seats $r = 10n$ people when n rows are opened. Complete the table for $n = 1, 3$, and 5 .

ANSWER _____

- 6** A food truck packs 13 sandwiches in each crate. Let c be the number of crates and s be the number of sandwiches. Write an equation, then find s when $c = 4$.

ANSWER _____

APPLY IT Show your work

- 1** A mobile game gives 15 stars for each level you finish. Let l be the number of levels and s be the number of stars. Make a table for $l = 0, 1, 3$, and 5 . List the ordered pairs you would graph, then write an equation.

WORK SPACE

ANSWER _____

- 2** You rent a scooter for \$7 each hour. Let h be the number of hours and c be the total cost. Make a table for $h = 0, 1, 3$, and 4 . Write an equation and name the dependent variable.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A reading app gives a new user 5 points to start and adds 3 points each day. Let d be the number of days and p be the total points. Write an equation. Then list the ordered pairs for $d = 0, 1$, and 3 , and explain why $p = 3d$ does not show the full relationship.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A craft club makes 5 bracelets per hour. Let h be the number of hours and b be the number of bracelets. Write an equation.	$b = 5h$
2	A video game gives 6 coins for each level completed. The equation is $c = 6l$. Complete the table for $l = 0, 1$, and 3 .	$c = 0, 6, 18$
3	A tank fills according to $v = 4m$, where m is the number of minutes and v is the liters of water. Which variable is dependent, and what does it represent?	v is the dependent variable. It represents the liters of water in the tank.
4	The equation is $y = 9x$. For $x = 0, 1$, and 3 , list the ordered pairs you would plot on a graph.	$(0, 0), (1, 9), (3, 27)$
5	A concert hall seats $r = 10n$ people when n rows are opened. Complete the table for $n = 1, 3$, and 5 .	$r = 10, 30, 50$
6	A food truck packs 13 sandwiches in each crate. Let c be the number of crates and s be the number of sandwiches. Write an equation, then find s when $c = 4$.	$s = 13c; s = 52$

PART 2 • APPLY IT

- Table: $l = 0, 1, 3, 5$ and $s = 0, 15, 45, 75$. Ordered pairs: $(0, 0), (1, 15), (3, 45), (5, 75)$. Equation: $s = 15l$.** Multiply each number of levels by 15 to find stars. Use levels as the first coordinate and stars as the second coordinate.
- Table: $h = 0, 1, 3, 4$ and $c = 0, 7, 21, 28$. Equation: $c = 7h$. The dependent variable is c , the total cost.** Multiply hours by 7 to find the cost. The cost depends on the number of hours rented.

CHALLENGE

$p = 3d + 5$. Ordered pairs: $(0, 5), (1, 8), (3, 14)$. The equation $p = 3d$ does not include the 5 starting points.

Accept equivalent equation forms, such as $5h = b$, when the variables keep the same meanings. For graph items, accept correctly plotted points with the independent variable on the horizontal axis and the dependent variable on the vertical axis.