

Proportional Relationships and Graphs



CCSS: 7.RP.A.2a: Decide whether two quantities are in a proportional relationship, e.g., ... graphing on a coordinate plane and observing whether the graph is a straight line through the origin. Also, 7.RP.A.2d.

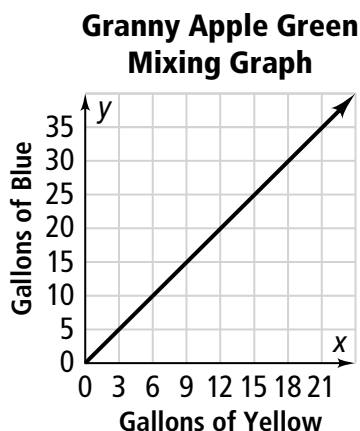
Launch

SAMPLE SOLUTIONS ARE SHOWN BELOW.

MP2, MP4

The manager of the car paint company prepares orders for its Granny Apple Green paint.

Tell how the graph can help you find the amounts of blue and yellow paint needed to make 8 gallons, 24 gallons, and 56 gallons of Granny Apple Green paint.



You can look at different points on the graph—(3, 5), (9, 15), and (21, 35)—to find the yellow and blue gallon mixes that result in 8, 24, and 56 gallons of Granny Apple Green, respectively.

The ratio of yellow to blue is always equivalent to $\frac{3}{5}$ as $\frac{3}{5} = \frac{9}{15} = \frac{21}{35}$. So, the paint color will always be Granny Apple Green.

Reflect Do you think a graph or a table makes it easier for the company to find the correct mix of blue and yellow paint to make Granny Apple Green?

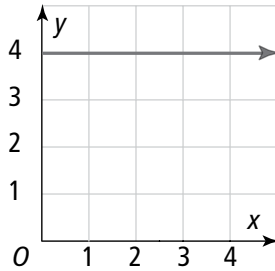
Sample: I think a table is better because you can see the exact number of gallons for each paint color. On a graph, if an order doesn't match to where grid lines cross, you have to estimate.

Got It?

PART 1 Got It (1 of 2)



Does the graph show a proportional relationship between x and y ? Explain.

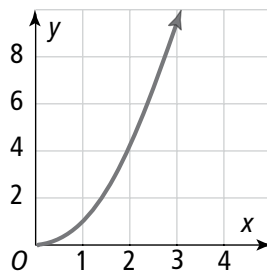


No; the graph does *not* pass through the origin so it does *not* show a proportional relationship between x and y .

PART 1 Got It (2 of 2) mc



Does the graph show a proportional relationship between x and y ? Explain.



The ratio of x to y is *not* the same at every point on the line.
The graph is *not* a straight line that passes through the origin.
No, the graph does *not* show a proportional relationship between x and y .

Got It?

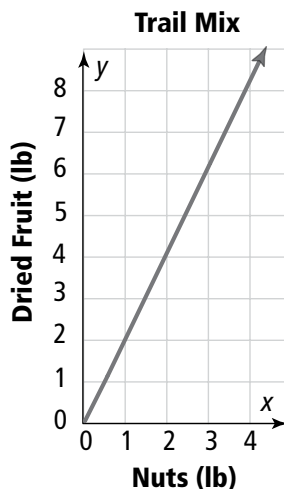
PART 2 Got It

- Does the equation $y = 4x + 1$ show a proportional relationship between x and y ? Explain.

No, the equation $y = 4x + 1$ does not show a proportional relationship between x and y . The graph of $y = 4x + 1$ does not pass through the origin.

PART 3 Got It

- The graph shows a proportional relationship between the amounts of nuts and dried fruit in a trail mix. You want to know how many pounds of dried fruit there are per pound of nuts. What point represents this unit rate?



(1, 2)

Close and Check

Focus Question

MP2, MP7

How can you tell if a graph shows a proportional relationship between two quantities?

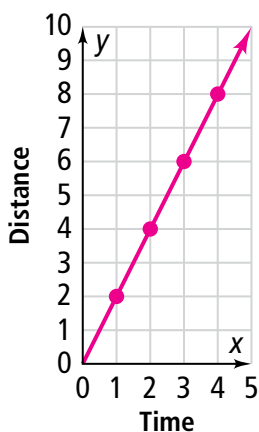
Sample: When a graph shows a proportional relationship between two quantities, the graph will be a straight line that passes through the origin.

Do you know HOW?

- The relationship between time x and distance y can be represented by the equation $y = 2x$. Complete the table and graph.

$y = 2x$

x	y
0	0
1	2
2	4
3	6
4	8
5	10



- What is the distance when time is equal to 15?
30 units
- What is the unit rate of the graph?
 $\frac{2}{1}$

SAMPLE SOLUTIONS ARE SHOWN BELOW.

Do you UNDERSTAND?

- Writing** Does the graph in Exercise 1 represent a proportional relationship? Explain how you know.

Yes. Each y -value is 2 times the x -value. Also, the graph passes through $(0, 0)$.

- Reasoning** Do all linear graphs represent proportional relationships? Explain.

No. A graph can be linear but if it doesn't pass through $(0, 0)$, it isn't proportional.

- Error Analysis** A classmate says that not all proportional relationships are linear. Do you agree? Explain.

No. They must be linear because each consecutive point on the graph is increased by the same multiple.