Name _____   Date _____

## Graphs of Proportional Relationships - Step-by-Step Lesson

Johnny purchased nuts. Create a graph to determine if the quantities of nuts and price are proportional for each serving size listed in the table. If the quantities are proportional, what is the constant of proportionality or unit rate that defines the relationship? Explain how the constant of proportionality was determined and how it relates to both the table and graph.

Pounds	2	4	6	8
Price	4	8	12	16

Explanation:

Linear functions are written in the form $y = mx + b$.
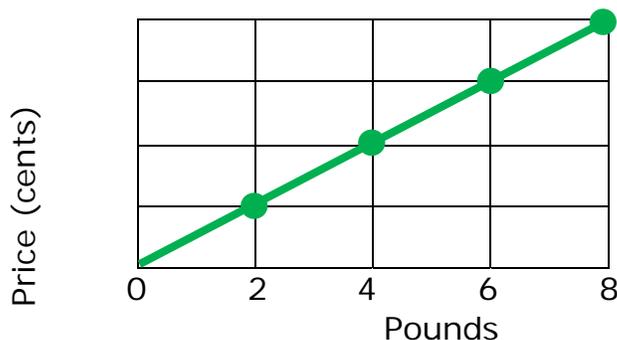
First find m. Look at the table and notice that every time the x terms go up by 2, the y terms go up by 4. This means that m is equal to 2.

x	y
2	4
4	8
6	12
8	16

Next find b. Take the equation $y = mx + b$ and plug in the m value (m = 2) and a pair of (x, y) coordinates from the table, such as (2, 4). Then solve for b.

Y = mx + b

4 = 2 (2) + b   Plug in m = 2, x = 2, and y = 4

4 = 4 + b

0 = b

Finally, use the m and b values you found (m = 2 and b = 0) to write the equation.

Y = mx + b

Y = 2x + 0 Plug in m = 2 and b = 0

Y = 2x

Now check your answer. Plug in each (x, y) pair in the table, and see if the result is a true statement.

Plug in (2, 4)	Plug in (4, 8)	Plug in (6, 12)	Plug in (8, 16)
Y = 2x	Y = 2x	Y = 2x	Y = 2x
4 = 2 x 2	Y = 2 x 4	Y = 2 x 6	Y = 2 x 8
4 = 4	8 = 8	Y = 12	Y = 16
		12 = 12	16 = 16

Each (x, y) pair from the table resulted in a true statement.

So, the linear equation is $y = 2x$.