

Display Master: Key Idea: Find the Missing Value

- To find the missing value in a proportion, find a common denominator of the 2 fractions representing the ratios and set the new numerators equal to each other.

Display Master: Pears and Apples A

When James goes grocery shopping, he buys 2 pears for every 6 apples. How many pears did he buy if he bought 15 apples?

$$\frac{2 \text{ pears}}{6 \text{ apples}} = \frac{x \text{ pears}}{15 \text{ apples}}$$

Times what?

Display Master: Pears and Apples B

<p>Proportion</p> $\frac{2 \text{ pears}}{6 \text{ apples}} = \frac{x \text{ pears}}{15 \text{ apples}}$		Solve	Multiplied numerators by ...
	Numerators		
	Denominators		
	Common denominator		

Display Master: Pears and Apples C

<p>Proportion</p> $\frac{2 \text{ pears}}{6 \text{ apples}} = \frac{x \text{ pears}}{15 \text{ apples}}$			Solve	Multiplied numerators by...
	Numerators	2 and x		
	Denominators	6 and 15		
	Common denominator	$6 \cdot 15 = 90$		

Display Master: Pears and Apples D

Proportion			Solve	Multiplied numerators by...
$\frac{2 \text{ pears}}{6 \text{ apples}} = \frac{x \text{ pears}}{15 \text{ apples}}$	Numerators	2 and x	$\frac{2}{6} = \frac{x}{15}$	
	Denominators	6 and 15		
	Common denominator		$6 \cdot 15 = 90$	

Display Master: Pears and Apples E

Proportion			Solve	Multiplied numerators by...
$\frac{2 \text{ pears}}{6 \text{ apples}} = \frac{x \text{ pears}}{15 \text{ apples}}$	Numerators	2 and x	$\frac{2}{6} = \frac{x}{15}$	
	Denominators	6 and 15	$\frac{2 \cdot 15}{6 \cdot 15} = \frac{x \cdot 6}{15 \cdot 6}$	
	Common denominator	$6 \cdot 15 = 90$	$\frac{30}{90} = \frac{6x}{90}$	

Display Master: Pears and Apples F

Proportion			Solve	Multiplied numerators by...
$\frac{2 \text{ pears}}{6 \text{ apples}} = \frac{x \text{ pears}}{15 \text{ apples}}$	Numerators	2 and x	$\frac{2}{6} = \frac{x}{15}$	
	Denominators	6 and 15	$\frac{2 \cdot 15}{6 \cdot 15} = \frac{x \cdot 6}{15 \cdot 6}$	
	Common denominator	$6 \cdot 15 = 90$	$\frac{30}{90} = \frac{6x}{90}$ $30 = 6x$	

Display Master: Pears and Apples G

Proportion			Solve	Multiplied numerators by...
$\frac{2 \text{ pears}}{6 \text{ apples}} = \frac{x \text{ pears}}{15 \text{ apples}}$	Numerators	2 and x	$\frac{2}{6} = \frac{x}{15}$	
	Denominators	6 and 15	$\frac{2 \cdot 15}{6 \cdot 15} = \frac{x \cdot 6}{15 \cdot 6}$	
	Common denominator	$6 \cdot 15 = 90$	$\frac{30}{90} = \frac{6x}{90}$ $30 = 6x$ $x = 5 \text{ pears}$	

Display Master: Pears and Apples H

Proportion			Solve	Multiplied numerators by...
$\frac{2 \text{ pears}}{6 \text{ apples}} = \frac{x \text{ pears}}{15 \text{ apples}}$	Numerators	2 and x	$\frac{2}{6} = \frac{x}{15}$	6 and 15
	Denominators	6 and 15	$\frac{2 \cdot 15}{6 \cdot 15} = \frac{x \cdot 6}{15 \cdot 6}$	
	Common denominator	$6 \cdot 15 = 90$	$\frac{30}{90} = \frac{6x}{90}$ $30 = 6x$ $x = 5 \text{ pears}$	

Proportion: $\frac{2 \text{ pears}}{6 \text{ apples}} = \frac{5 \text{ pears}}{15 \text{ apples}}$

Display Master: Red and Purple Beads A

Leslie wants to make a necklace with all of the red and purple beads in her bag. She wants to know how many red beads she should add for every section of 8 purple beads. Her bag of beads has 3 red beads for every 12 purple beads.

$$\frac{x \text{ red beads}}{8 \text{ purple beads}} = \frac{3 \text{ red beads}}{12 \text{ purple beads}}$$

Times what?

Display Master: Red and Purple Beads B

<p>Proportion</p> $\frac{x \text{ red}}{8 \text{ purple}} = \frac{3 \text{ red}}{12 \text{ purple}}$		<p>Solve</p>	<p>Multiplied numerators by...</p>
	<p>Numerators</p>	$\frac{x}{8} = \frac{3}{12}$	
	<p>Denominators</p>		
	<p>Common denominator</p>		

Display Master: Red and Purple Beads C

<p>Proportion</p> $\frac{x \text{ red}}{8 \text{ purple}} = \frac{3 \text{ red}}{12 \text{ purple}}$			<p>Solve</p>	<p>Multiplied numerators by...</p>
	<p>Numerators</p>	<p>x and 3</p>	$\frac{x}{8} = \frac{3}{12}$	
	<p>Denominators</p>	<p>8 and 12</p>		
	<p>Common denominator</p>	<p>$8 \cdot 12 = 96$</p>		

Display Master: Red and Purple Beads D

Proportion			Solve	Multiplied numerators by...
$\frac{x \text{ red}}{8 \text{ purple}} = \frac{3 \text{ red}}{12 \text{ purple}}$	Numerators	x and 3	$\frac{x}{8} = \frac{3}{12}$	
	Denominators	8 and 12	$\frac{x \cdot 12}{8 \cdot 12} = \frac{3 \cdot 8}{12 \cdot 8}$	
	Common denominator	$8 \cdot 12 = 96$		

Display Master: Red and Purple Beads E

Proportion			Solve	Multiplied numerators by...
$\frac{x \text{ red}}{8 \text{ purple}} = \frac{3 \text{ red}}{12 \text{ purple}}$	Numerators	x and 3	$\frac{x}{8} = \frac{3}{12}$	
	Denominators	8 and 12	$\frac{x \cdot 12}{8 \cdot 12} = \frac{3 \cdot 8}{12 \cdot 8}$	
	Common denominator	$8 \cdot 12 = 96$	$\frac{12x}{96} = \frac{24}{96}$	

Display Master: Red and Purple Beads F

Proportion			Solve	Multiplied numerators by...
$\frac{x \text{ red}}{8 \text{ purple}} = \frac{3 \text{ red}}{12 \text{ purple}}$	Numerators	x and 3	$\frac{x}{8} = \frac{3}{12}$	
	Denominators	8 and 12	$\frac{x \cdot 12}{8 \cdot 12} = \frac{3 \cdot 8}{12 \cdot 8}$	
	Common denominator	$8 \cdot 12 = 96$	$\frac{12x}{96} = \frac{24}{96}$ $12x = 24$	

Display Master: Red and Purple Beads G

Proportion			Solve	Multiplied numerators by...
$\frac{x \text{ red}}{8 \text{ purple}} = \frac{3 \text{ red}}{12 \text{ purple}}$	Numerators	x and 3	$\frac{x}{8} = \frac{3}{12}$	
	Denominators	8 and 12	$\frac{x \cdot 12}{8 \cdot 12} = \frac{3 \cdot 8}{12 \cdot 8}$	
	Common denominator	$8 \cdot 12 = 96$	$\frac{12x}{96} = \frac{24}{96}$ $12x = 24$ $x = 2 \text{ red beads}$	

Display Master: Red and Purple Beads H

Proportion			Solve	Multiplied numerators by...
$\frac{x \text{ red}}{8 \text{ purple}} = \frac{3 \text{ red}}{12 \text{ purple}}$	Numerators	x and 3	$\frac{x}{8} = \frac{3}{12}$	
	Denominators	8 and 12	$\frac{x \cdot 12}{8 \cdot 12} = \frac{3 \cdot 8}{12 \cdot 8}$	
$\text{Proportion: } \frac{2 \text{ red}}{8 \text{ purple}} = \frac{3 \text{ red}}{12 \text{ purple}}$	Common denominator		$\frac{12x}{96} = \frac{24}{96}$	8 and 12
	$8 \cdot 12 = 96$		$12x = 24$	
$x = 2 \text{ red beads}$				