Display Master: Key Idea: Building Cross Products

- To find missing values by using common denominators, multiply the denominator of 1 fraction representing a ratio by the numerator of the fraction representing the other ratio and vice versa. Then set these products equal to each other and solve the equation to find the missing value.

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Strategy From Common Denominators

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Display Master: Table A

Proportion			Solve	Multiplied numerators by...
$\dfrac{4 \text{ boys}}{6 \text{ girls}} = \dfrac{x \text{ boys}}{9 \text{ girls}}$	Numerators			
	Denominators			
	Common denominator			
$\dfrac{2 \text{ pears}}{6 \text{ apples}} = \dfrac{x \text{ pears}}{15 \text{ apples}}$	Numerators			
	Denominators			
	Common denominator			
$\dfrac{x \text{ red}}{8 \text{ purple}} = \dfrac{3 \text{ red}}{12 \text{ purple}}$	Numerators			
	Denominators			
	Common denominator			
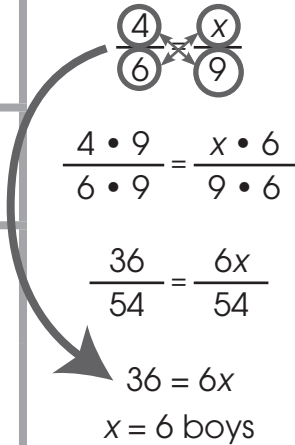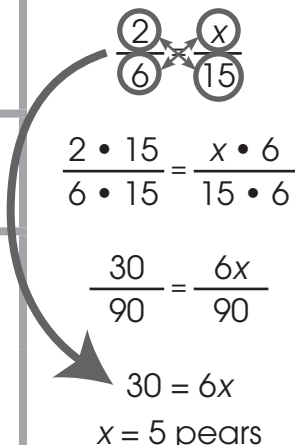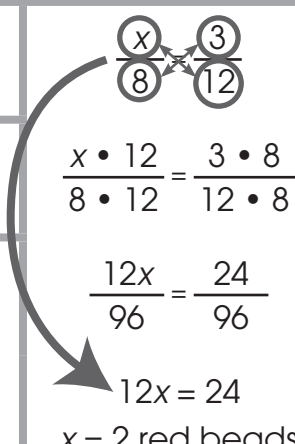
Display Master: Table B

Proportion			Solve	Multiplied numerators by...
$\dfrac{4 \text{ boys}}{6 \text{ girls}} = \dfrac{x \text{ boys}}{9 \text{ girls}}$	Numerators	4 and x	$\dfrac{4}{6} = \dfrac{x}{9}$ $\dfrac{4 \cdot 9}{6 \cdot 9} = \dfrac{x \cdot 6}{9 \cdot 6}$ $\dfrac{36}{54} = \dfrac{6x}{54}$ $36 = 6x$ $x = 6 \text{ boys}$	6 and 9
	Denominators	6 and 9		
	Common denominator	54		
$\dfrac{2 \text{ pears}}{6 \text{ apples}} = \dfrac{x \text{ pears}}{15 \text{ apples}}$	Numerators			
	Denominators			
	Common denominator			
$\dfrac{x \text{ red}}{8 \text{ purple}} = \dfrac{3 \text{ red}}{12 \text{ purple}}$	Numerators			
	Denominators			
	Common denominator			

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Display Master: Table C

Proportion			Solve	Multiplied numerators by...
$\dfrac{4 \text{ boys}}{6 \text{ girls}} = \dfrac{x \text{ boys}}{9 \text{ girls}}$	Numerators	4 and x	$\dfrac{4}{6} = \dfrac{x}{9}$ $\dfrac{4 \cdot 9}{6 \cdot 9} = \dfrac{x \cdot 6}{9 \cdot 6}$ $\dfrac{36}{54} = \dfrac{6x}{54}$ $36 = 6x$ $x = 6 \text{ boys}$	6 and 9
	Denominators	6 and 9		
	Common denominator	54		
$\dfrac{2 \text{ pears}}{6 \text{ apples}} = \dfrac{x \text{ pears}}{15 \text{ apples}}$	Numerators	2 and x	$\dfrac{2}{6} = \dfrac{x}{15}$ $\dfrac{2 \cdot 15}{6 \cdot 15} = \dfrac{x \cdot 6}{15 \cdot 6}$ $\dfrac{30}{90} = \dfrac{6x}{90}$ $30 = 6x$ $x = 5 \text{ pears}$	6 and 15
	Denominators	6 and 15		
	Common denominator	90		
$\dfrac{x \text{ red}}{8 \text{ purple}} = \dfrac{3 \text{ red}}{12 \text{ purple}}$	Numerators	x and 3	$\dfrac{x}{8} = \dfrac{3}{12}$ $\dfrac{x \cdot 12}{8 \cdot 12} = \dfrac{3 \cdot 8}{12 \cdot 8}$ $\dfrac{12x}{96} = \dfrac{24}{96}$ $12x = 24$ $x = 2 \text{ red beads}$	8 and 12
	Denominators	8 and 12		
	Common denominator	96		

Display Master: Table D

Proportion			Solve	Multiplied numerators by...
$\dfrac{4 \text{ boys}}{6 \text{ girls}} = \dfrac{x \text{ boys}}{9 \text{ girls}}$	Numerators	4 and x	$\dfrac{4}{6} \diagup\!\!\!\!\diagdown \dfrac{x}{9}$ $\dfrac{4 \cdot 9}{6 \cdot 9} = \dfrac{x \cdot 6}{9 \cdot 6}$ $\dfrac{36}{54} = \dfrac{6x}{54}$ $36 = 6x$ $x = 6 \text{ boys}$	6 and 9
	Denominators	6 and 9		
	Common denominator	54		
$\dfrac{2 \text{ pears}}{6 \text{ apples}} = \dfrac{x \text{ pears}}{15 \text{ apples}}$	Numerators	2 and x	$\dfrac{2}{6} \diagup\!\!\!\!\diagdown \dfrac{x}{15}$ $\dfrac{2 \cdot 15}{6 \cdot 15} = \dfrac{x \cdot 6}{15 \cdot 6}$ $\dfrac{30}{90} = \dfrac{6x}{90}$ $30 = 6x$ $x = 5 \text{ pears}$	6 and 15
	Denominators	6 and 15		
	Common denominator	90		
$\dfrac{x \text{ red}}{8 \text{ purple}} = \dfrac{3 \text{ red}}{12 \text{ purple}}$	Numerators	x and 3	$\dfrac{x}{8} \diagup\!\!\!\!\diagdown \dfrac{3}{12}$ $\dfrac{x \cdot 12}{8 \cdot 12} = \dfrac{3 \cdot 8}{12 \cdot 8}$ $\dfrac{12x}{96} = \dfrac{24}{96}$ $12x = 24$ $x = 2 \text{ red beads}$	8 and 12
	Denominators	8 and 12		
	Common denominator	96		