7.1 Ratios and Rates

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For a time, the Boston Symphony Orchestra was made up of 95 musicians.

Violins	29	Violas	12
Cellos	10	Basses	9
Flutes	5	Trumpets	3
Double reeds	8	Percussion	5
Clarinets	4	Harp	1
Horns	6	Trombones	3

You can compare the different groups by using ratios. A <u>ratio</u> is a comparison of two quantities using division.

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For example, you can use a ratio to compare the number of violins (29) with the number of violas (12). This ratio can be written in three ways.

29 to 12 (0)different from the ratio of violas to violins, The order of the terms is important.

Ratios can be written to compare a part to a part, a part to the whole, or the whole to a part. **Reading Math**

Read the ratio $\frac{29}{12}$ as "twenty-nine to twelve."

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Use the table to write the ratio.

Animals at the Vet		
Cats	5	
Dogs	7	2
Rabbits	2	J Wau
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cats to rabbits

Use the table to write the ratio.

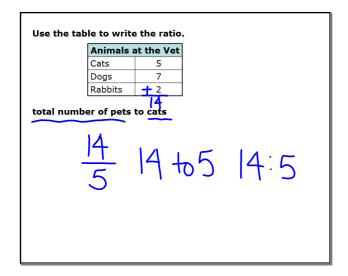
Animals at the Vet Cats Dogs 7 Rabbits 2

dogs to total number of pets

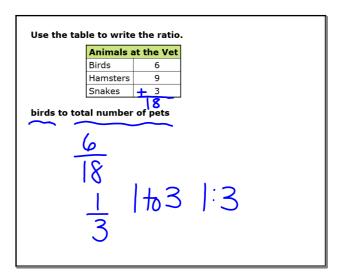
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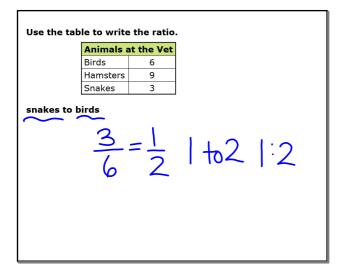
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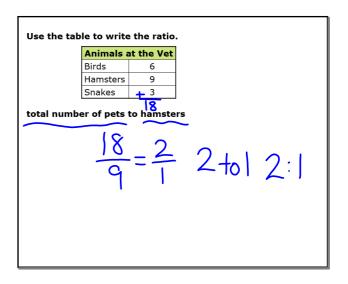
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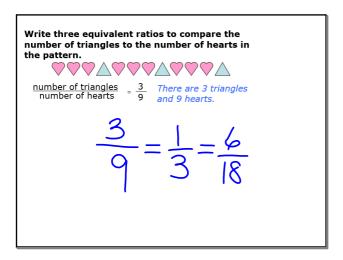
<u>Equivalent ratios</u> are ratios that name the same comparison. You can find an equivalent ratio by multiplying or dividing both terms of a ratio by the same number.

$$\frac{1}{3} = \frac{2}{6}$$
 $\frac{10}{15} = \frac{2}{3}$

Write three equivalent ratios to compare the number of diamonds to the number of spades in the pattern. $\frac{1}{6} = \frac{3 + 3}{6 + 3} = \frac{1}{2}$ There are 3 diamonds and 6 spades. $\frac{3}{6} = \frac{3 + 3}{6 + 3} = \frac{1}{2}$ There is 1 diamond for every 2 spades. $\frac{3}{6} = \frac{3 \cdot 3}{6 \cdot 3} = \frac{9}{18}$ If you triple the pattern, there will be 9 diamonds for 18 spades.

So $\frac{3}{6}$, $\frac{1}{2}$, and $\frac{9}{18}$ are equivalent ratios.

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