

What do you know about ratios?

Discuss advertisements on pg. 264 with students.

boys : girls
5 : 8**Ratios**

A ratio is a comparison between two or more things. There are three forms in which you can write a ratio:

- 1) using a colon, 4 : 7
- 2) using the word "to", 4 to 7
- 3) as a fraction, $\frac{4}{7}$

In each case, it is read as 4 to 7. A ratio does not mean much if you do not know what you are comparing. Therefore, it is always **important to state above the ratio what you are comparing:**

boys to girls
4 to 7

Also, **order is very important with ratios**. The ratio boys to girls is not the same as the ratio of girls to boys, because they are not in the same order.

You can have a two term or three term ratio.

A **part to part ratio** is comparing one part of a collection to another part, for example boys to girls. A part to part ratio can not be written as a fraction.

A **part to whole ratio** is comparing one part of the collection to the whole collection, such as boys to all students.

Three-Term Ratio: compare three quantities to each other

You can find **equivalent ratios the same way you find equivalent fractions**, multiply (or divide) each term by the same number.

ex. boys to girls an equivalent ratio is: b : g

$\times 2$ $\left(\begin{array}{l} 4 \text{ to } 7 \\ 8 : 14 \end{array} \right) \times 2$

Putting a ratio in lowest terms, is the same as putting a fraction in lowest terms, divide by a common factor, until the terms have no more common factors.

$$\frac{1}{4} \times 2 = \frac{2}{8} = \frac{3}{12}$$

$$\frac{12 \div 3}{15 \div 3} = \frac{20}{\boxed{}}$$

Reduction

$$\frac{4 \times 5}{5 \times 5} = \frac{20}{\boxed{25}}$$



Two-Term Ratio

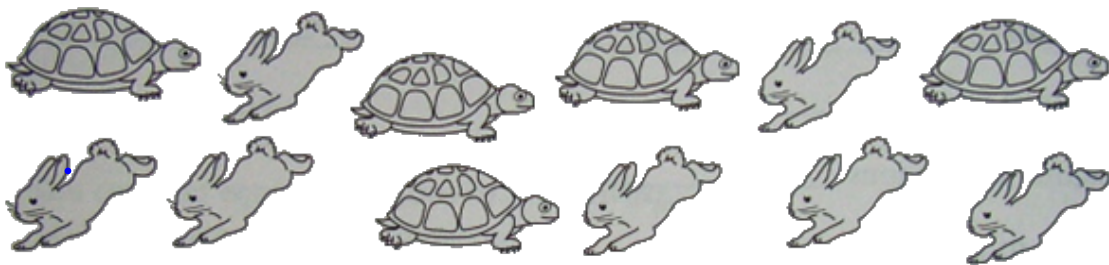
1. part-to-whole ratio
 basketball : All balls
 $7 : 20$

2. part-to-part ratio
 basketballs : tennis balls
 $7 : 8$

Three-Term Ratio
 Basketball : tennisball : golf ball
 $7 : 8 : 5$

There are more examples there
 but just give 1 example

Write each part-to-whole ratio as a ratio, a fraction and a percent.
Round percents to 2 decimal places.



Part to Whole

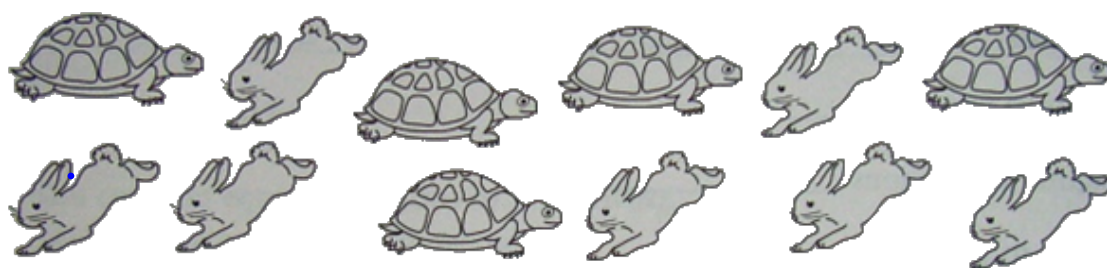
Rabbit : Whole
7 : 12

$$\frac{7}{12} = 0.5\overline{83} = 58\%$$

Part : Whole
turtle : Whole
5 : 12

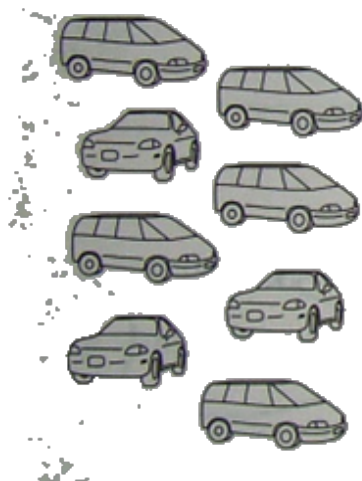
$$\frac{5}{12} = 0.41\overline{6} \approx 42\%$$

Write each part-to-whole ratio as a ratio, a fraction and a percent.
 Round percents to 2 decimal places.

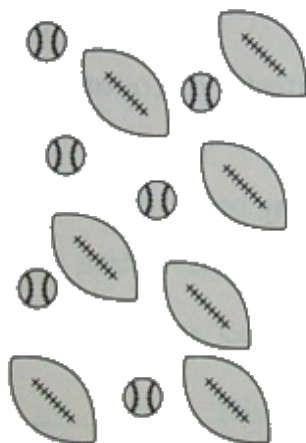


Write each part-to-part ratio.

a) cars to vans



b) footballs to baseballs



c) bananas to fruit



At a class party, there are 16 boys, 15 girls, and 4 adults.
Show each ratio as many ways as you can.

Total
 $16 + 15 + 4$
35

- boys to girls
- boys to girls to adults
- adults to total number of people at the party

a) boys : girls
 $16 : 15$
doesn't reduce

b) boys : girls : adult
 $16 : 15 : 4$

c) Adults : total
 $4 : 35$

Equivalent Ratios

$$\frac{1 \times 2}{4 \times 2} = \frac{2}{8}$$

$$\frac{1 \times 3}{4 \times 3} = \frac{3}{12}$$

$\frac{1}{4}, \frac{2}{8}, \frac{3}{12}$
equivalent

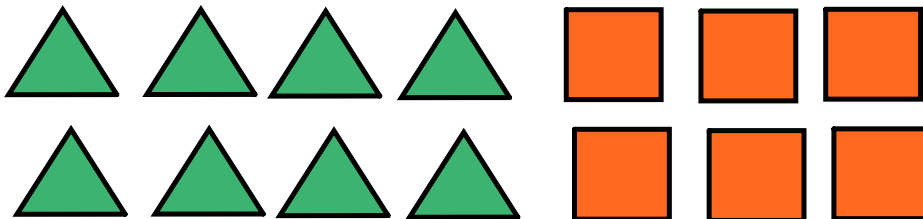
How do you find equivalent fractions?



What is the ratio of triangles to squares?

Triangles to squares
 $\frac{4}{\cancel{x2}}$ to $\frac{3}{\cancel{x2}}$

for every triangles there is squares



Triangles to squares
 $\frac{8}{\cancel{x2}}$ to $\frac{6}{\cancel{x2}}$

4 to 3 = 8 to 6. These are called equivalent ratios. Equivalent ratios are equal.

To find equivalent fractions, multiply (or divide) all terms by the same number.

You can find **equivalent ratios** by dividing.
 Divide the terms by the same number.

$$\frac{20}{30} = \frac{10}{\boxed{15}}$$

(Handwritten: green arrows from 20 to 10 and 30 to 15, with a green 2 above the first arrow and a green 2 below the second arrow)

$$\frac{20}{30} = \frac{4}{\boxed{6}}$$

(Handwritten: blue arrows from 20 to 4 and 30 to 6, with a blue 5 above the first arrow and a blue 5 below the second arrow)

$$\frac{20}{30} = \frac{2}{\boxed{}}$$

(Handwritten: blue arrows from 20 to 2 and 30 to the box, with a blue 10 above the first arrow and a blue 10 below the second arrow)

1st Term	20	10	4	$\div 2$	2	x 11	22
2nd Term	30	15	6	$\div 2$	3	x 11	33

Three equivalent ratios of 20:30 are:

To write a ratio in its simplest form, divide the terms by their GCF.

$$21:14$$

$$\div 7 \quad \div 7$$

$$3:2$$

A ratio is in simplest form when its terms have no common factors.

$$21$$

$$1 \times 21$$

$$3 \times 7$$

$$14$$

$$1 \times 14$$

$$2 \times 7$$

the GCF = 7

Examples

1. Write 3 ratios equivalent to 2:5.

$$2:5$$

$$4:10, 6:15, 8:20$$

$$\begin{array}{c} 2:5 \\ \times 2 \quad \times 2 \end{array}$$

$$\begin{array}{c} 2:5 \\ \times 3 \quad \times 3 \end{array}$$

$$\begin{array}{c} 2:5 \\ \times 4 \quad \times 4 \end{array}$$

2. Write 3 ratios equivalent to 36:6.

$$\begin{array}{c} 36:6 \\ \div 2 \quad \div 2 \end{array}$$

← Put in lowest terms

$$6:1$$

$$12:2$$

$$18:3$$

$$\begin{array}{c} 18:3 \\ \div 3 \quad \div 3 \end{array}$$

$$6:1$$

$$60:10$$

3. Construction kits come in different sizes. The regular kit contains 120 long rods, 80 short rods and 40 connectors. List 3 other kits that could be created with the same ratio of rods and connectors.

long : Short : connectors

$$120:80:40$$

$$\begin{array}{l} \div 10 \rightarrow \\ 12:8:4 \end{array}$$

$$\begin{array}{l} \div 2 \rightarrow \\ 6:4:2 \end{array}$$

$$\begin{array}{l} \div 2 \rightarrow \\ 3:2:1 \end{array}$$

Class/Homework

Homework pg. 266 - 268

4(b,c), 5(a,b), 6(a,b,c,d,e), 8(a,b), 11[a, i to iv, b],
14(a,b,c,)

4a) $5:8$
 $\frac{5}{8}$

b) $12:16$
 $\frac{12}{16} = \frac{6}{8} = \frac{3}{4}$

c) $4:9$
 $\frac{4}{9}$

5a) $\frac{19}{20} \times \frac{95}{100}$
 \swarrow top \searrow bottom \nearrow $\times 100$
 0.95 95%

HOMEWORK pg. 273-274

4, #5a, #6(a,b), #7c, #8(a,c), #9(a,c), #10(a,b,c)
(you do not need tables for 5-7)

* like test