



## Place value

Numbers are made up of **digits**. The position of each digit in a number shows what it stands for. This is known as **place value**.

Whole numbers are called **integers**.

Look at the digit five in these whole numbers. Its value changes depending upon its place in the number.

Number in digits	Number in words	Value of five digit
5	five	5
54	fifty-four	50
523	five hundred and twenty-three	500
5178	five thousand, one hundred and seventy-eight	5000
50411	fifty thousand, four hundred and eleven	50 000
539902	five hundred and thirty-nine thousand, nine hundred and two	500 000
5810350	five million, eight hundred and ten thousand, three hundred and fifty	5 000 000

Can you see how each time the digit moves one place to the left, it becomes ten times as big? What happens when it moves one place to the right?

To compare two numbers, look at the digit in the largest place value position. If these are the same, look at the value of the next digit to the right. Keep doing this until you have found the larger number.

**Example question:** Lauren and Grace are playing a video game:

Lauren's score = **66 780**

Grace's score = **66 695**

Who has the highest score?



The ten thousands and the thousands digits are both the same but if you move one more place to the right you can see that Lauren has a 7 in the hundreds place but Grace only has a 6. So, Lauren has the highest score.



### Keywords

**Digit** ► Individual figures that make up numbers

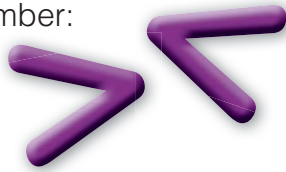
**Place value** ► The place of each digit shows its value in the number

**Integer** ► Whole numbers, which can be positive or negative – they cannot be fractions or decimal numbers

## Comparing numbers

When comparing numbers, you can use **symbols** to show which is the smaller and which is the larger number:

- $>$  is greater than
- $<$  is smaller than



**Example question:** Insert either  $=$ ,  $<$  or  $>$  between these pairs of operations.

$12 \times 10$	$240 \div 20$
$75 + 45$	$200 - 60$
$0.25 + 0.5$	$0.6 + 0.1$

Work out each operation and then choose the correct symbol to place between them.

120	$=$	120
120	$<$	140
0.75	$>$	0.7



When using the smaller than and greater than symbols ( $<$  and  $>$ ), it is helpful to think of a crocodile's mouth opening to eat the larger number.

For example:  
 $24\,345 < 25\,358$

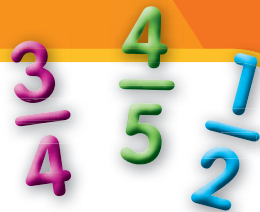


With a partner, take turns to roll four dice. Rearrange the dice to make a four-digit number. The winner is the person who makes the number closer to 3000.



- 1 Arrange these numbers in order, smallest first:  
12 121, 12 221, 10 221,  
11 222, 12 112, 10 212
- 2 What is the largest odd number you can make from these digits?  
4 7 3 8 1 5
- 3 Put either  $<$  or  $>$  between these four numbers to make the sequence correct:  
303 103 301 130
- 4 What number is ten times 1658?
- 5 Write the number four million, eight hundred and three thousand, six hundred and two in digits.

## Fractions



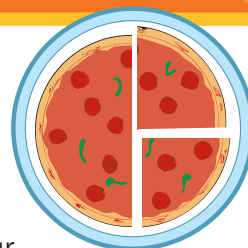
There are usually two ways of working with **fractions**.

- To represent numbers that are not **integers**. For example,  $5\frac{3}{4}$  is more than 5 units but less than 6.
- To find fractions of shapes or quantities. For example, you might have to find a **quarter** of a rectangle or **four-fifths** of £25.00

Fractions, together with **decimals** and **percentages**, are all used to show parts of a whole. You will need to be able to change between all three.

For example  $\frac{1}{4} = 0.25 = 25\%$

## Equivalent fractions

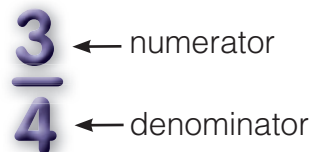


**Equivalent fractions** look different but have the same value.

For example, you might eat half a pizza while your friend eats two-quarters. You have both eaten the same amount.  $\frac{1}{2} = \frac{2}{4}$

In a fraction:

- the top number is the **numerator**
- the bottom number is the **denominator**



To find equivalent fractions, you must either **multiply** or **divide** the numerator and denominator by the same amount.

**Example question:** Complete the missing number in the box.

$$\frac{3}{4} = \frac{\square}{12}$$

x3

First look at the **denominators**. To get from 4 to 12 you have to multiply by 3.

$$\frac{3}{4} = \frac{\square}{12}$$

x3

Multiply the numerator by the same amount.  $3 \times 3 = 9$

You might have to **reduce** or simplify a fraction to get the smallest possible numerator and denominator. Use **factors** to do this.

**Example question:** Reduce  $\frac{24}{32}$  to its **simplest** terms.

$$\frac{24}{32}$$

Work out what **factors** both 24 and 32 share. 1, 2, 4 and 8.

$$\frac{24}{32} = \frac{3}{4}$$

÷8

The highest common factor is 8 so divide both the numerator and the denominator by 8.

## Improper fractions

In **improper fractions** the **numerator** is bigger than the **denominator**.

To change improper fractions to **mixed numbers**, divide the numerator by the denominator. Your answer will be a whole number with any remainder added on as a fraction.

**Example question:** Change  $\frac{25}{6}$  to a mixed number.  
 $25 \div 6 = 4$  remainder 1. So the answer is  $4\frac{1}{6}$ .



Think of a fraction as a division sum using the line as the  $\div$ .

Divide to find decimals,

$$\text{e.g. } \frac{1}{2} = 1 \div 2 = 0.5$$



### Keywords

**Fraction** ➤ Any part of a number, e.g.  $\frac{3}{4}$  means 3 out of 4 equal parts

**Equivalent fractions** ➤ Different fractions that represent the same amount

**Reduce** ➤ Simplify a fraction to get the lowest **numerator** and **denominator** possible

**Improper fractions** ➤ Any fraction where the **numerator** is bigger than the **denominator** – they are 'top-heavy' fractions, e.g.  $\frac{10}{8}$

**Mixed numbers** ➤ Numbers that are a mix of integer and fraction, e.g.  $4\frac{3}{5}$



Buy a packet of multi-coloured sweets. Sort them into colours. What fraction of the whole is each colour? Can you reduce any of these fractions?



1 Liu has a purse with eight copper and four silver coins in it only. What fraction are copper coins?

2 Complete this row of equivalent fractions:

$$\frac{1}{4} = \frac{\square}{12} = \frac{6}{\square} = \frac{\square}{48}$$

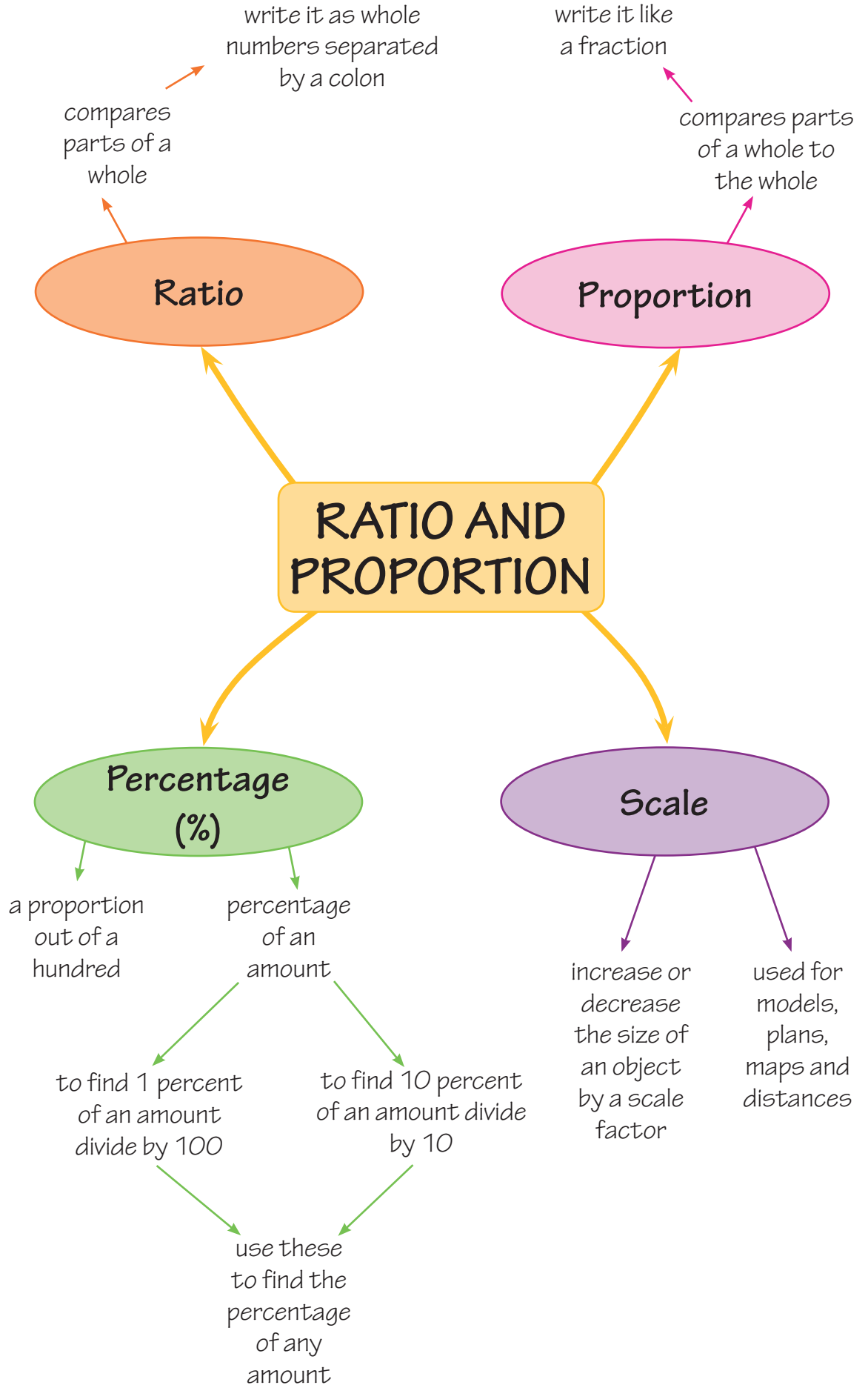
3 Reduce these fractions:

a.  $\frac{10}{25}$     b.  $\frac{18}{36}$     c.  $\frac{14}{49}$

4 Change these improper fractions to mixed numbers:

a.  $\frac{21}{8}$     b.  $\frac{17}{5}$     c.  $\frac{38}{9}$

Now see if you can remember all the main points from this topic.  
Have a go at drawing your own mind map.



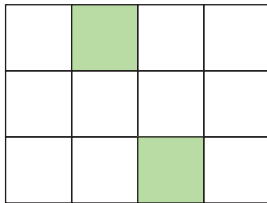
**1** In Miss Patel's class, one in every eight children is left-handed. There are 32 children in the class. How many are left-handed? **(1 mark)**

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**2** In a tin of sweets, the ratio of orange to cola to lime sweets is 3:5:4. There are 204 sweets in the tin. How many are there of each flavour? **(1 mark)**

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**3** Look at this pattern. **(1 mark)**  
Colour more squares until the ratio of shaded to unshaded squares is 3:1



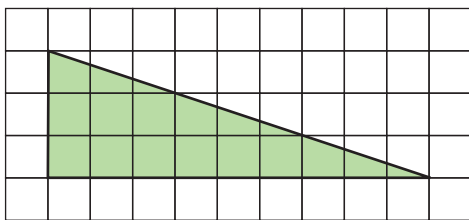
**4** Calculate **(1 mark)**  
a. 10 percent of £35.60 = .....

b. 45 percent of 1240 = .....

**5** Carla works on Saturday at the hairdressers. She was paid £26. Her wages have just increased by 20 percent. How much does she get paid now? **(1 mark)**

.....

**6** On this grid draw a similar triangle that is three times smaller. **(1 mark)**



**7** On a 1:50 000 scale map, a distance is measured as being 15 cm. How far would this actually be in kilometres? **(1 mark)**

.....

**8** At Roman Road Primary School, 90 percent of the infant children have school meals. That is twice the proportion of junior children. There are 120 infants and 220 juniors in the school. How many have school meals? **(1 mark)**

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