
million
minus
divide
add
Numeracy
%
integer
equals
multiply
estimate

‘How to cards’

Multiplication

e.g

Calculate
152 x 34

First write the numbers in columns

$$\begin{array}{rrr} & 1 & 5 & 2 \\ \times & & 3 & 4 \\ \hline \end{array}$$

Then follow the steps to the right

4 x 2 = 8

$$\begin{array}{rrr} & 1 & 5 & 2 \\ \times & & 3 & 4 \\ \hline & & & 8 \end{array}$$

4 x 5 = 20

$$\begin{array}{rrr} & 1 & 5 & 2 \\ \times & & 3 & 4 \\ \hline & {\scriptstyle 2}\,0 & 8 \end{array}$$

4 x 1 = 4

$$\begin{array}{rrr} & 1 & 5 & 2 \\ \times & & 3 & 4 \\ \hline & 6_{\,2} & 0 & 8 \end{array}$$

Place a zero on the next line

$$\begin{array}{rrr} & 1 & 5 & 2 \\ \times & & 3 & 4 \\ \hline & 6_{\,2} & 0 & 8 \\ & & & 0 \end{array}$$

3 x 2 = 6

$$\begin{array}{rrr} & 1 & 5 & 2 \\ \times & & 3 & 4 \\ \hline & 6_{\,2} & 0 & 8 \\ & & 6 & 0 \end{array}$$

3 x 5 = 15

$$\begin{array}{rrr} & 1 & 5 & 2 \\ \times & & 3 & 4 \\ \hline & 6_{\,2} & 0 & 8 \\ {\scriptstyle 1}\,5 & 6 & 0 \end{array}$$

3 x 1 = 3

$$\begin{array}{rrr} & 1 & 5 & 2 \\ \times & & 3 & 4 \\ \hline & 6_{\,2} & 0 & 8 \\ 4_{\,1} & 5 & 6 & 0 \end{array}$$

Add these numbers in columns to get the final answer.

$$\begin{array}{rrr} & 1 & 5 & 2 \\ \times & & 3 & 4 \\ \hline & 6_{\,2} & 0 & 8 \\ 4_{\,1} & 5 & 6 & 0 \\ \hline 5_{\,1} & 1 & 6 & 8 \end{array}$$

Division

By a ONE-DIGIT Number

e.g. 9138 ÷ 6

First write the numbers with the bus-stop.

$$6 \overline{)\,9\;1\;3\;8}$$

Then follow the steps to the right.

$$\begin{array}{r} 1 \\ 6 \overline{)\,9^{3}1\;3\;8} \end{array}$$

How many times does 6 go into 9?

1 remainder 3 .

$$\begin{array}{r} 1\;5 \\ 6 \overline{)\,9^{3}1^{1}3\;8} \end{array}$$

How many times does 6 go into 31?

5 remainder 1 .

$$\begin{array}{r} 1\;5\;2 \\ 6 \overline{)\,9^{3}1^{1}3^{1}8} \end{array}$$

How many times does 6 go into 13?

2 remainder 1 .

$$\begin{array}{r} 1\;5\;2\;3 \\ 6 \overline{)\,9^{3}1^{1}3^{1}8} \end{array}$$

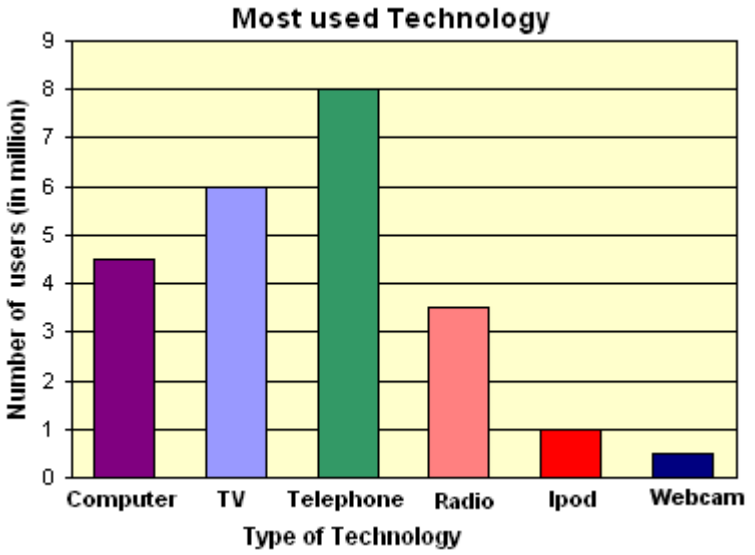
How many times does 6 go into 18?

3 with no remainder.

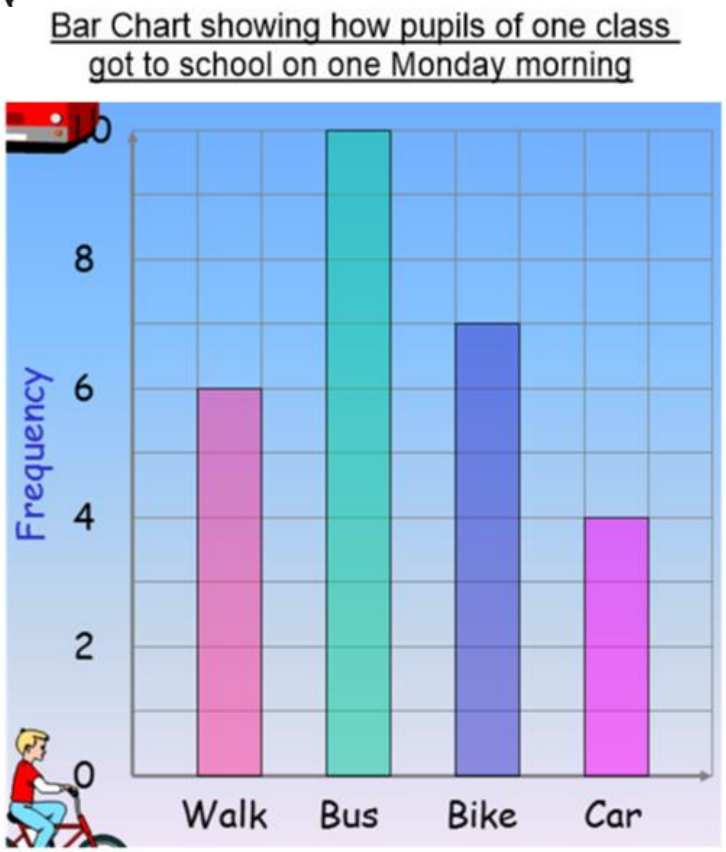
Drawing bar charts

When drawing bar charts make sure that:

- All bars are the **same width**.
- There is a **gap** between each bar - these should all be the same width too.
- The **height** of the bar represents the ***frequency***.
- There is a ***continuous scale*** up the vertical axis.
- Each bar is **labelled**.
- The bar chart has a **title**.



Interpreting bar charts



The **height** of each bar represents the **frequency**.

For example: the bar labelled Walk has a frequency of 6. This means there are 6 people who walk to school on this particular Monday morning.

To see how many people were asked in total, you must find the frequency of each bar and add them together.
6+10+7+4 = 27

Interpreting line graphs

To find the temperature on Wednesday:

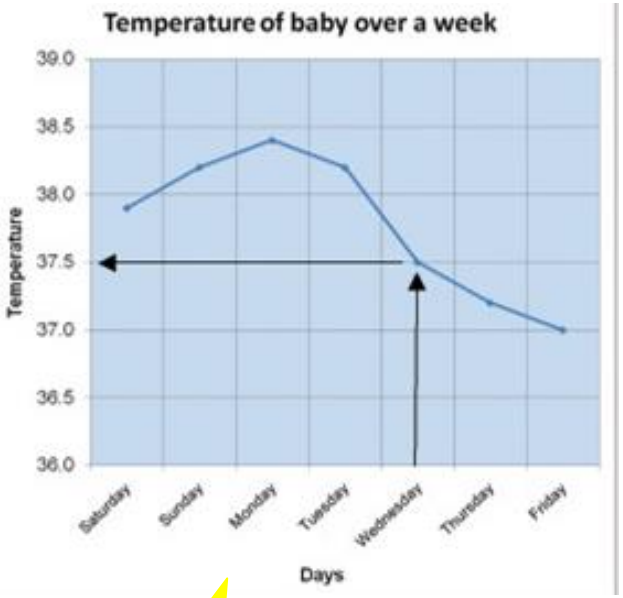
- Find Wednesday on the axis
- Draw a straight line to the graph
- Draw a straight line from the graph to the other axis
- Read off the value to get the temperature

To find the highest temperature:

- Find the highest point on the graph
- Draw a horizontal straight line to the temperature axis
- Read off the value

To describe what is happening from the graph:

- Look for high points and low points and when these happen? Is there a reason for this?
- Is there a trend? Does the line gradually increase or decrease? Is there a reason for this?



Exam Tip: always use units in your answers e.g. 37.5 degrees

Interpreting Pie Charts

Pie charts are circular charts divided into segments which each represent a value.

The bigger the segment, the higher the proportion for that category.

Pie charts are often labelled with percentages to help the accuracy of interpreting what each segment shows.

It is possible to measure the angles at the centre of the pie chart. This will help find the biggest sections and can lead to finding the value for each segment. .

Look out for segments that are obvious fractions of the full circle (half or quarter).

e.g.

A pie chart to show the favourite colours of 40 children

- Half of 40 children prefer blue. So 20 chose blue.
- A quarter of 40 children prefer red. So 10 chose red.
- The most popular colour is blue.

Calculate a number as a percentage of another

There are **35** sweets in a bag. **Four** of the sweets are orange flavour. What percentage of the sweets are orange flavour?

Example

4 out of 35 = $\frac{4}{35}$

Then convert the fraction to a percentage

$\frac{4}{35}$ X 100 = 11.4 %

James scores **12** out of **70** in a Geography test. What is the percentage of his mark?

Example

12 out of 70 = $\frac{12}{70}$

Then convert the fraction to a percentage

$\frac{12}{70}$ X 100 = 17.14%

Calculate percentages of quantities

Without a calculator

Most percentages can be built up using 1%, 5% and 10%.

Example: Find 26% of £80

10% of £80 = £8 **20% therefore equals £16**

5% is half of 10% **so 5% of £80 = £4**

1% of £80 = £0.80

So 26% of £80 =

£16.00
+ £ 4.00
+ £ 0.80

= £20.80

Calculate percentages of quantities

With a calculator

To find a percentage, divide the percentage by 100 and multiply by the quantity in the question

Example

Find 38% of £48

38 ÷ 100 x 48

= £18.24

Fraction of an Amount

Calculate $\frac{2}{5}$ of 20

£8

Start by splitting the amount into 5 equal parts.

We are interested in 2 of these parts.

Calculate $\frac{3}{7}$ of 49

£21

Calculate $\frac{5}{9}$ of 81

£45

Simplifying Fractions

To simplify fully we need to divide top AND bottom by the same number until we can't any more.

$$\frac{20}{100} \xrightarrow[\div 2]{\div 2} \frac{10}{50} \xrightarrow[\div 2]{\div 2} \frac{5}{25} \xrightarrow[\div 5]{\div 5} \frac{1}{5}$$

You can simplify the same fraction lots of different ways

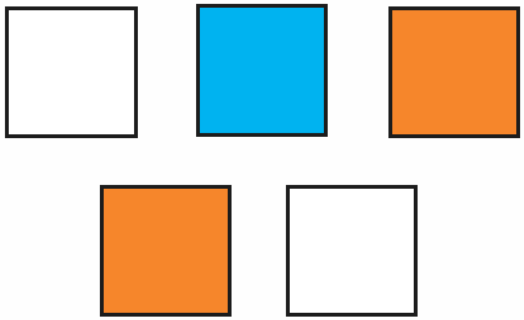
$$\frac{20}{100} \xrightarrow[\div 10]{\div 10} \frac{2}{10} \xrightarrow[\div 2]{\div 2} \frac{1}{5}$$

Adding and Subtracting Fractions with the same denominator

Fractions can be added and subtracted. It is much easier to do when the denominators are both the same number.

Adding Fractions

As a fraction, how many of the boxes are coloured?

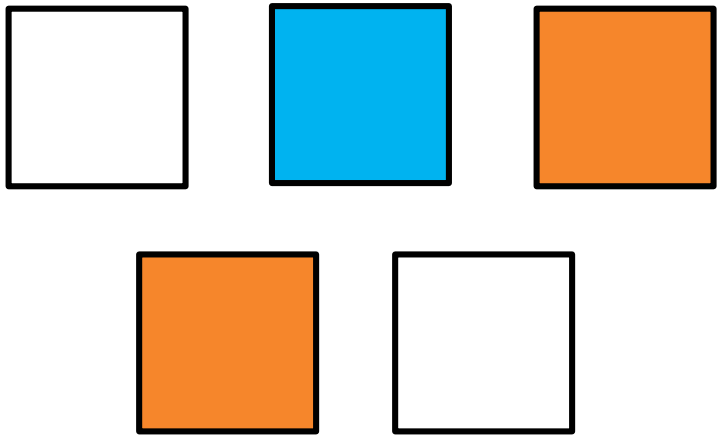


First of all we need to know the denominator.
Secondly, we need to find the fractions of the coloured boxes.
Lastly, we add these two fractions together.

Adding and Subtracting Fractions with the same denominator

Adding Fractions

As a fraction, how many of the boxes are blue?

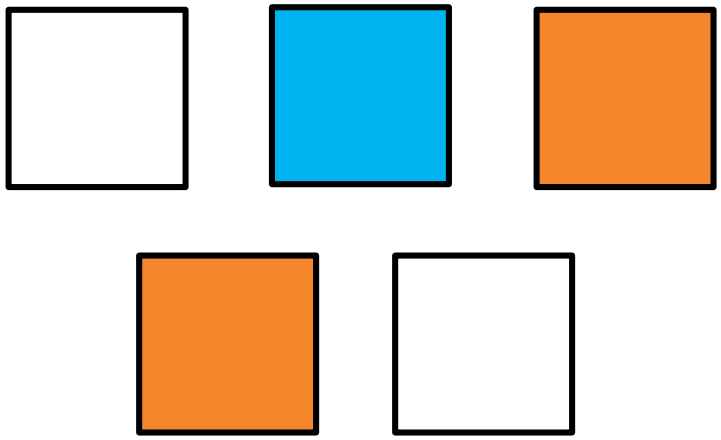


$\frac{1}{5}$ of the boxes are blue.

Adding and Subtracting Fractions with the same denominator

Adding Fractions

As a fraction, how many of the boxes are orange?



$\frac{1}{5}$ of the boxes are blue.

We now have our 2 fractions!

$\frac{2}{5}$ of the boxes are orange.

Adding and Subtracting Fractions with the same denominator

Adding Fractions

To find the amount of coloured boxes, we add both of these fractions together.

$$\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$$

The denominators are both the same number so we leave them as they are, they don't get added together (this is very important).

We simply add the two numerators together!

Adding and Subtracting Fractions with the same denominator

Subtracting Fractions

Subtracting fractions with the same denominator, is similar to adding fractions with similar denominator, is really simple!

- Write down your calculation.
- Your answer will have the same denominator.
- Find the difference between the numerators – you have you answer!
- If you can, simplify the new fraction to its lowest form.

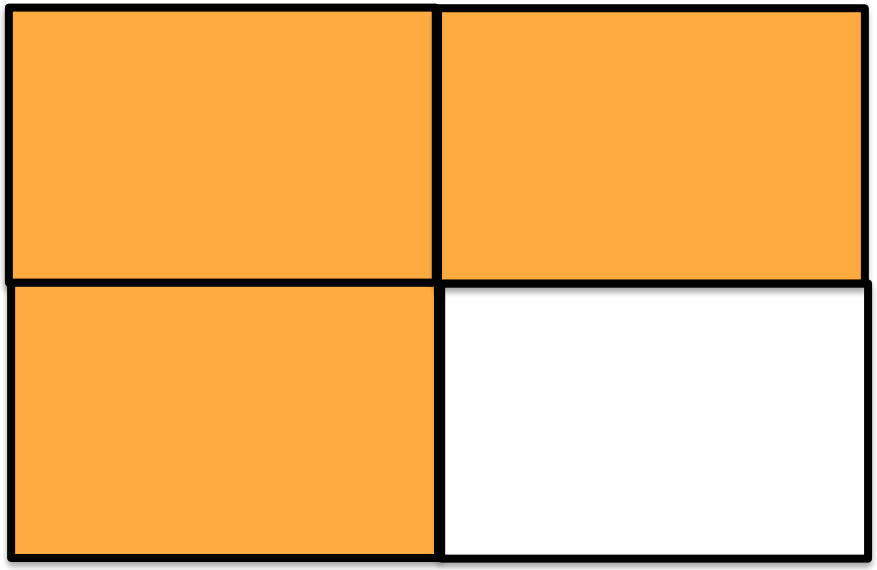
Numerator:

Denominator:

$$\frac{5}{6} - \frac{3}{6} = \frac{2}{6} = \frac{1}{3}$$

Adding and Subtracting Fractions with the same denominator

Subtracting Fractions



$$\frac{3}{4} - \frac{1}{4} = \frac{2}{4} \text{ or } \frac{1}{2}$$

Rounding to decimal places

Eg round 4.638 to 1 decimal place

1st decimal place | 2nd decimal place | 3rd decimal place

4 . 6 | 3 8 = 4 . 6 (1dp)

Imagine line after desired decimal place

If the number after the line is 5 or more, increase the value before the line by 1

If not, don't change the value before the line

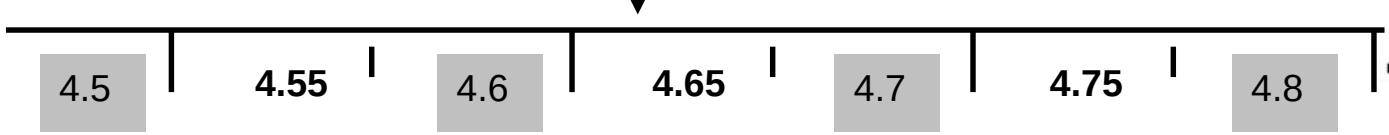
Write a rounded value with as many digits as there were before the line

Don't change

5 or more?

Why does this work?

4.638 is closest to **4.6**



Rounding to decimal places

1st decimal place | 2nd decimal place | 3rd decimal place

Eg round 23.4281 to 2 decimal places

Imagine line after desired decimal place

If the number after the line is 5 or more, increase the value before the line by 1

If not, don't change the value before the line

Write a rounded value with as many digits as there were before the line

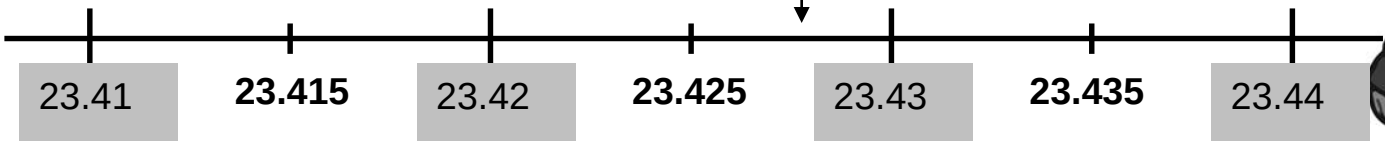
23 . 4 2 | 8 1 = 23.43 (2dp)

Increase by 1

5 or more?

Why does this work?

23.4281 is closest to **23.43**



Rounding to decimal places

Eg round 7.496 to 2 decimal places

1st decimal place | 2nd decimal place | 3rd decimal place

7 . 4 9 | 6 = 7.50 (2dp)

Increase by 1

5 or more?

Imagine line after desired decimal place

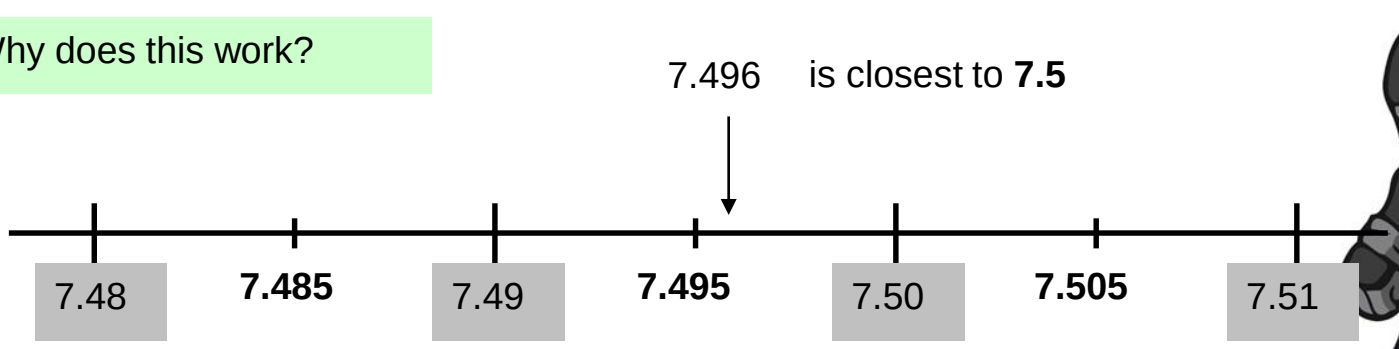
If the number after the line is 5 or more, increase the value before the line by 1

If not, don't change the value before the line

If increasing the value makes it 10, you must carry into the next column, as you would with written addition

Write a rounded value with as many digits as there were before the line

Why does this work?



Bidmas

Brackets
Indices
Division
Multiplication
Addition
Subtraction

This is the order in which calculations should be done.
Make sure you do not move the numbers around they need to stay in the same place.

Examples

What is $8 + 2 \times 4$?

$$8 + 2 \times 4 = 8 + 8$$
$$= 16$$

What is $24 \div 6 \div 2$?

$$24 \div 6 \div 2 = 4 \div 2$$
$$= 2$$

What is $(4^2 - 13) \div 3$?

$$(16 - 13) \div 3$$
$$3 \div 3 = 1$$

Adding and Subtracting Decimals

IMPORTANT -The decimal points MUST be aligned before adding/subtracting the numbers. Make sure that the numbers are the same length.

Examples

2.7 + 5.46	62.9 – 8.79	3 – 0.24
2.70 +	62.90 -	3.00 -
5.46	9.79	0.24
8.16	53.11	2.76

Estimating

Example 1: **Estimate** the solution to 6.7 x 4.3 =

Estimating wants us to make a **good guess** by rounding the numbers in the question.

7 x 4 =

28

The actual answer is 28.81 so we're not that far off!!

Example 2: **Estimate** the solution to 196 ÷ 12 =

200 ÷ 10 =

20

The actual answer is 16.333... so again we are close to the original.

Types of number

Prime Numbers:

2, 3, 5, 7, 11, 13, 17, 19, 23, 27, 29 …..

A number is **prime** if it **can only be divided by 1 and itself.**

Square Numbers:

1 x 1 = 1
2 x 2 = 4
3 x 3 = 9
4 x 4 = 16
5 x 5 = 25
6 x 6 = 36
7 x 7 = 49
8 x 8 = 64
9 x 9 = 81
10 x 10 = 100
11 x 11 = 121
12 x 12 = 144

When a number is multiplied by itself, the solutions are **square numbers**.

Cube Numbers:

1 x 1 x 1 = 1
2 x 2 x 2 = 8
3 x 3 x 3 = 27
4 x 4 x 4 = 64
5 x 5 x 5 = 125

When a number is multiplied by itself 3 times, the solutions are **cube numbers**.

What is a FACTOR???

FACTOR

Factor – a number which divides exactly into another number (fits)

What are factors of 10?

1 10
2 5

Multiples:

A **multiple** is the result of multiplying by a whole number

How can we find the first 4 multiples of 3?

By writing the first 4 numbers of the 3 times tables

Multiples of 3: 3, 6, 9, 12, ……

eg1 Find the first 4 multiples of 6.

Multiples of 6: 6, 12, 18, 24, ……

DO YOURSELF: Find the first four multiples of 12.

Multiples of 12: