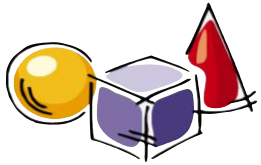
Year 5 Maths Facts



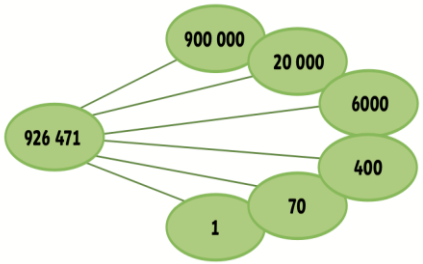
Place Value to One Million

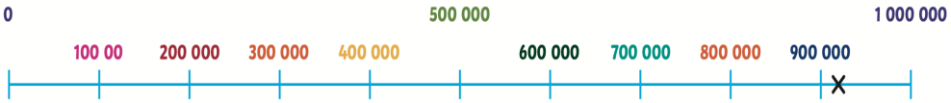
M	Hth	Tth	Th	H	T	O	t	h	th
Millions 1 000 000	Hundred Thousands 100 000	Ten Thousands 10 000	Thousands 1000	Hundreds 100	Tens 10	Ones 1	Tenths 0.1	Hundredths 0.01	Thousandths 0.001

926 471

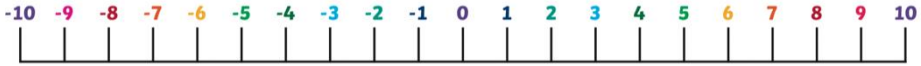
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
9	2	6	4	7	1

nine hundred and twenty-six thousand, four hundred and seventy-one





Count Forwards and Backwards through 0



Negative Numbers **Positive Numbers**

Compare and Order

equals	greater than	less than
26 + 38 = 8 × 8	23 873 > 8256	901 198 < 1 091 098
Both calculations have the value 64.	The number on the left has 2 ten thousands and the number on the right has 0 ten thousands.	The number on the right has 1 million and the number on the left has 0 millions.

smallest | 898 | 6735 | 6835 | 7019 | 9002 | 11 235 | greatest

Counting in 10s

365	375	385	395	405	415

The tens increase until 9 tens becomes one more hundred and 0 tens.

Counting in 100s

2841	2941	3041	3141	3241	3341

The hundreds increase until 9 hundreds becomes one more thousand and 0 hundreds.

Counting in 10 000s

276 109	286 109	296 109	306 109

The ten thousands increase until 9 ten thousands become one more hundred thousand and 0 ten thousands.

Counting in 100 000s

2 972 151	3 072 151	3 172 151	3 272 151

The hundred thousands increase until 9 hundred thousands becomes one more million and 0 hundred thousands.

Converting Capacity

×1000

l ml

÷1000

1000ml = 1 litre

$\frac{1}{10}$l = 0.1l = 100ml

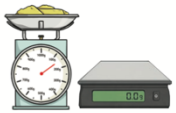
$\frac{1}{4}$l = 0.25l = 250ml

$\frac{1}{2}$l = 0.5l = 500ml

$\frac{3}{4}$l = 0.75l = 750ml

$\frac{1}{100}$l = 0.01l = 10ml

Converting Mass



×1000

kg g

÷1000

1000g = 1kg

$\frac{1}{10}$kg = 0.1kg = 100g

$\frac{1}{4}$kg = 0.25kg = 250g

$\frac{1}{2}$kg = 0.5kg = 500g

$\frac{3}{4}$kg = 0.75kg = 750g

Converting Length

×1000 ×100 ×10

km m cm mm

÷1000 ÷100 ÷10

1000 metres = 1 kilometre

100cm = 1m

10mm = 1cm

$\frac{1}{10}$km = 0.1km = 100m

$\frac{1}{4}$km = 0.25km = 250m

$\frac{1}{2}$km = 0.5km = 500m

$\frac{3}{4}$km = 0.75km = 750m

Year

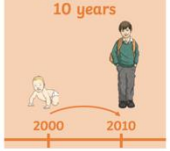
1 year = 12 months = 52 weeks = 365 days

Leap Year

1 leap year = 366 days

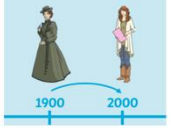
Decade

1 decade = 10 years



Century

1 century = 100 years



Millennium

1 millennium = 1000 years

Week

1 week = 7 days

Fortnight

1 fortnight = 2 weeks

Month

Capacity

l
cl
ml

1 litre = 1000 millilitres

1 centilitre = 10 millilitres

1 litre = 35.19 fluid ounces

1 litre = 1.75 pints

1 litre = 0.21 gallons

1 gallon = 8 pints

l
fl oz
pt
gal

Mass

t
kg
g
mg

1 tonne = 1000 kilograms

1 kilogram = 1000 grams

1 gram = 1000 milligrams

g
oz
kg
lb
s

1 gram = 0.035 ounces

1 kilogram = 2.2 pounds

1 stone = 14 pounds

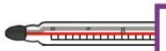
1 stone = 6.35 kilograms

Currency

£
p

1 pound = 100 pence

Temperature

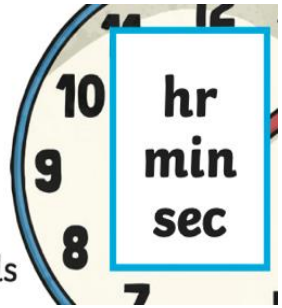


°C
°F

1° celsius = 33.8° fahrenheit

0° celsius = 32° fahrenheit

Time



hr
min
sec

1 day = 24 hours

1 hour = 60 minutes

1 minute = 60 seconds

Rounding to the nearest 10

20	21	22	23	24	25	26	27	28	29	30

round down (21–24) | round up (25–29)

Rounding to the nearest 1000

2000 ← 2499 | 2500 → 3000

round down | round up

Rounding to the nearest 100 000

200 000 ← 249 999 | 250 000 → 300 000

round down | round up

Rounding to Estimate

41 635 + 7386 = 49 021

Round to ten:

41 630 + 7380 = 49 010

41 630 + 7390 = 49 020

41 640 + 7390 = 49 030

Rounding is not as accurate when both numbers are rounded up. A better estimate comes from "rounding" one down and one up.

Estimating on a Number Line

The arrow is about $\frac{3}{4}$ of the way across the line so it is 40 000.

Rounding to Check Answers

Rounding is a great way to make a number simpler while keeping it close to the value that it was. Rounding can be used to help check answers to calculations.

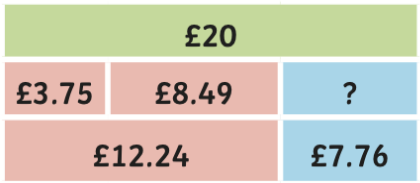
For example: 3487 + 2725 = **6212** | 3500 + 2700 = **6200**

Rounding to Check Answers

Rounding is a great way to make a number simpler while keeping it close to the value that it was. Rounding can be used to help check answers to calculations.

For example: 9877 - 3827 = **6050** | 9900 - 3800 = **6100**

Multistep Problem – Using a bar model



£20 is used to buy 2 books costing £3.75 and £8.49.

How much change is given?

£3.75 + £8.49 = £12.24

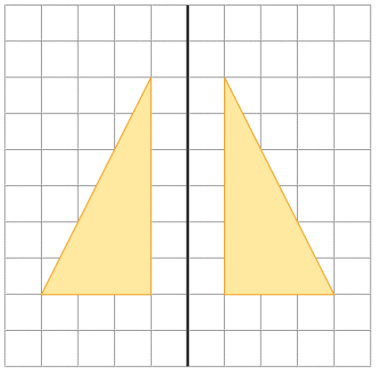
£20.00 - £12.24 = £7.76

Roman Numerals

	I = 1	II = 2	III = 3	
IV = 4	V = 5	VI = 6	VII = 7	VIII = 8
IX = 9	X = 10	XI = 11	XX = 20	XXX = 30
XL = 40	L = 50	LX = 60	LXX = 70	LXXX = 80
XC = 90	C = 100	CL = 150	CC = 200	CCC = 300
CD = 400	D = 500	DC = 600	DCC = 700	DCCC = 800
CM = 900	M = 1000	MC = 1100	MD = 1500	MM = 2000

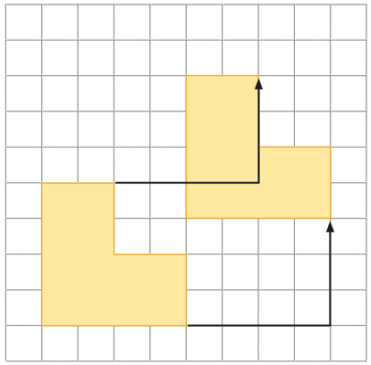
A shape is reflected when is flipped over a mirror line.

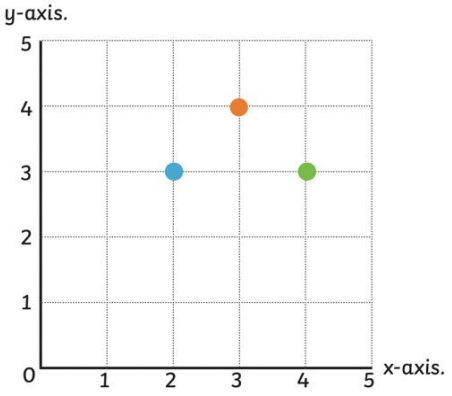
The reflected image is congruent to the original. This means that the measurements of the sides and angles have not changed. Each point of the reflected shape is the same distance from the mirror line as the original shape.



In maths, translation means moving an object on a grid. The object is moved without changing the size, turning or reflecting it.

When translating an object on a grid, it can move up or down, left or right.





Coordinates are a useful way to locate a position on a map or grid.

The numbers across the horizontal line of the grid are on the **x-axis**.

The numbers on the vertical line of the grid are on the **y-axis**.

We always read or write the number on the x-axis before the y-axis.

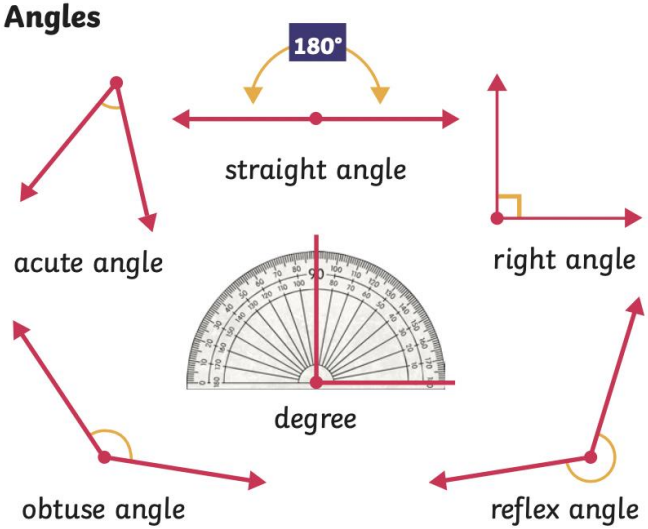
The x and y position are written in brackets with a comma.

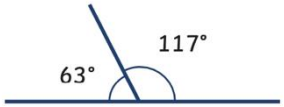
The coordinate of the orange spot is **(3, 4)**.

To help you remember which point to read or write first, simply remember to move 'along the corridor and up the stairs'.

In other words, move on the **x-axis** and then move on the **y-axis**.

Angles



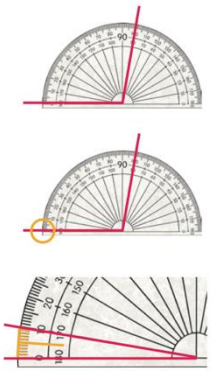


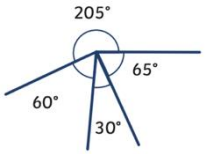
Angles on a straight line always total 180°.

Angles on a straight line always total 180°.

How to Use a Protractor

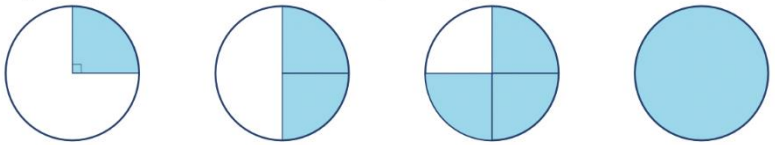
1. Place the cross of circle at the point (vertex) of the angle that you are measuring.
2. Read from the zero on the outer scale of your protractor.
3. Count the degree lines carefully.





Angles around a point always total 360°.

Multiples of 90° can be used as descriptions of a turn.



$\frac{1}{4}$ turn = 90° $\frac{1}{2}$ turn = 180° $\frac{3}{4}$ turn = 270° 1 turn = 360°

A table to show ticket prices at a local cinema.

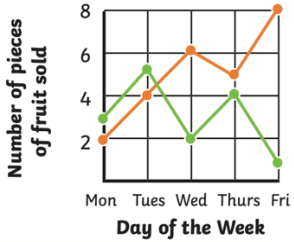
Ticket Type	Weekday Price	Weekend Price
Adult	£6	£7.50
Child	£4	£4.50
Student	£5.50	£6

In order to understand the data presented in a table, you must read the **table's title** and the **headings**. Remember to always look at the heading that **each piece of information** falls under.

Here is a table showing the number of different types of fruit sold each day.

	Bananas	Apples
Mon	2	3
Tues	4	5
Wed	6	2
Thurs	5	4
Fri	8	1

This graph can be used to represent the data from the table.



Here is a bus timetable:

Bus stop locations	Three different buses		
Mill Road	0726		0842
High Street	0729	0803	
Pitsmoor Road	0759	0833	
Fulwood	0845	0919	0946

The bus starts at this time and location.

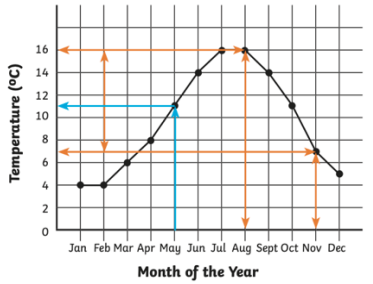
The bus does not stop here.

The bus terminates at this time and location.

Here is a line graph showing the average temperature for each month.

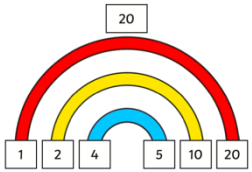
The y-axis shows temperature in intervals of 2°C on a scale of 0°C to 16°C.

The points show the average temperature for each month.



The x-axis shows the months of the year.

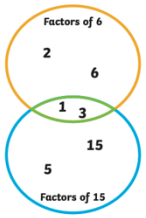
A factor is a number that divides into another number exactly, without leaving a remainder.



The factors of 20 are 1, 2, 4, 5, 10 and 20.

The factor pairs are:
1 and 20
2 and 10
4 and 5

A common factor is a factor of 2 or more numbers.



A multiple is a number that can be divided evenly by a given number.

For example, 12 × 1 = **12**, 12 × 2 = **24**, 12 × 3 = **36**

The multiples of 12 include: 12, 24, 36, 48...

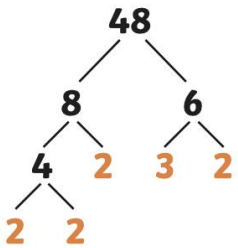
Prime Numbers

A natural number greater than 1 with no divisors other than 1 and itself.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	9	95	96	97	98	99	100

Prime Factors

Prime factors are the factors of a number that are prime. They can be found using a diagram like this:



Square and Cube Numbers

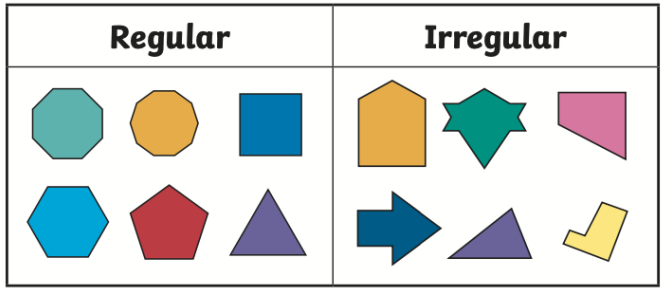
1^2 1×1=1	1^3 1×1×1=1
2^2 2×2=4	2^3 2×2×2=8
3^2 3×3=9	3^3 3×3×3=27
4^2 4×4=16	4^3 4×4×4=64
5^2 5×5=25	5^3 5×5×5=125
6^2 6×6=36	6^3 6×6×6=216
7^2 7×7=49	7^3 7×7×7=343
8^2 8×8=64	8^3 8×8×8=512
9^2 9×9=81	9^3 9×9×9=729
10^2 10×10=100	10^3 10×10×10=1000
11^2 11×11=121	11^3 11×11×11=1331
12^2 12×12=144	12^3 12×12×12=1728

Related Calculations

8 × 9 = 72 80 × 9 = 720	9 × 8 = 72 90 × 8 = 720
72 ÷ 9 = 8 720 ÷ 9 = 80	72 ÷ 8 = 9 720 ÷ 8 = 90

Common Factors

A common factor is a number which is a factor of two or more other numbers. For example, 3 is a common factor of 6 and 9.

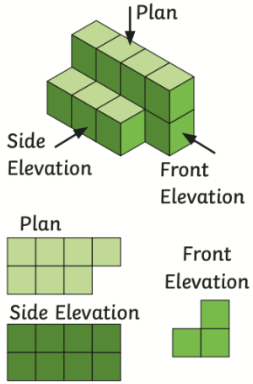


A polygon is any two-dimensional shape formed with straight lines.

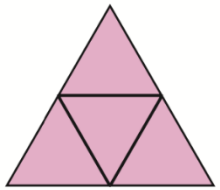
In a regular polygon, all the sides and angles are equal.

In an irregular polygon, the sides and angles are not equal.

Cube models can be drawn as 2D representations using different elevations.



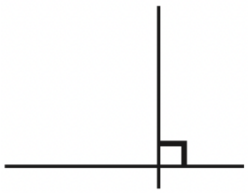
A shape net is a 2D drawing of an unfolded 3D shape. When you are drawing or reasoning about shape nets, think carefully about where the edges of the faces meet.



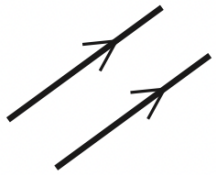
Shape net of a tetrahedron.

A **rectilinear** shape is one which is bound by straight lines and can be divided into rectangles or triangles in order to find its area.

Perpendicular



Parallel



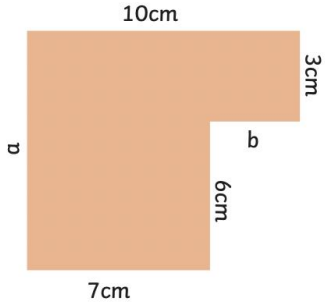
Equal

Name	Surfaces		Edges		Vertices	Picture
	Flat	Curved	Flat	Curved		
cube	6	0	12	0	8	
cuboid	6	0	12	0	8	
square-based pyramid	5	0	8	0	5	
tetrahedron	4	0	6	0	4	
triangular prism	5	0	9	0	6	
pentagonal prism	7	0	15	0	10	
hexagonal prism	8	0	18	0	12	
octagonal prism	10	0	24	0	16	
octahedron	8	0	12	0	6	

A **rectilinear** shape is one which is bound by straight lines and can be divided into rectangles or triangles in order to find its area.

Finding the perimeter of a Rectilinear Shape

You can calculate the perimeter of a rectilinear shape by adding together the length of each side. **You may need to calculate the length of any sides not given.**



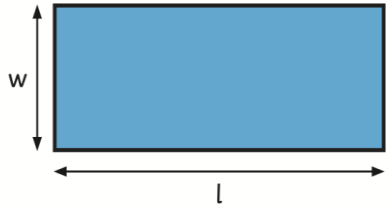
a= 6cm + 3cm = **9cm**

b= 10cm - 7cm = **3cm**

The perimeter:

10cm + 3cm + 3cm + 6cm + 7cm + 9cm = **38cm**

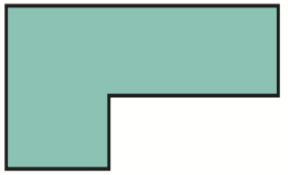
Measure the perimeter of a rectangle:



Measure the length (l) and width (w).

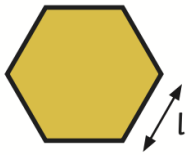
Perimeter = l + w + l + w or (l + w) × 2

Measure the perimeter of irregular shapes:



Measure the length of each side and add them together.

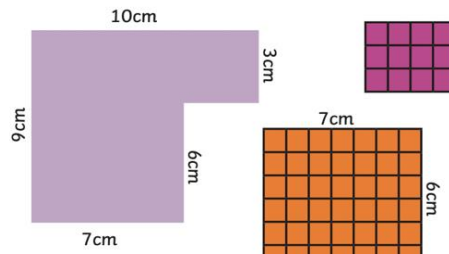
Measure the perimeter of regular shapes:

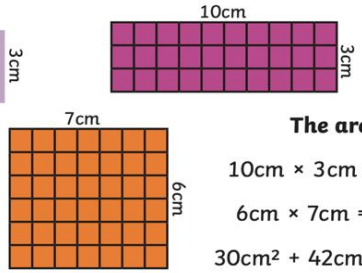


Measure the length (l) and count the number of sides (s) on the shape.

Perimeter = l × s

You can calculate the area of shapes made up of rectangles by breaking them down into individual rectangles.





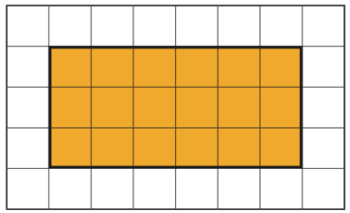
The area:

10cm × 3cm = **30cm²**

6cm × 7cm = **42cm²**

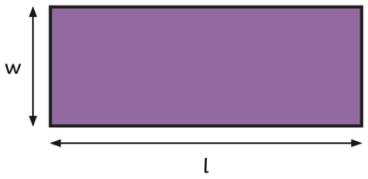
30cm² + 42cm² = **72cm²**

The area of a rectangle on a grid:

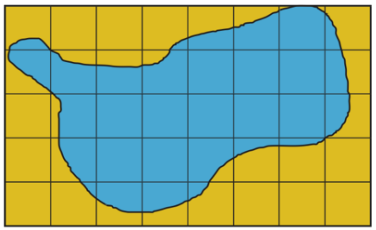


Multiply the length × width
= 6 × 3 = 18 squares.

The area of a rectangle = length (l) × width (w).



To find the area of an irregular shape, find the number of whole squares and part squares.



Whole squares = 10
Part squares = 22

Estimate of area = whole squares + half part squares

= **10cm² + 11cm² = 21cm²**

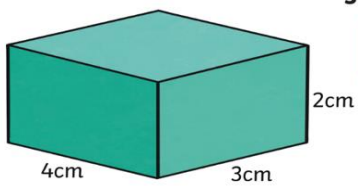
*There are other ways to estimate the area of irregular shapes.

Volume

3D shapes have volume.

length × height × depth = volume

4cm × 2cm × 3cm = 24cm³



Mixed Numbers

Mixed numbers contain a whole number and a fraction.

$2\frac{1}{4}$

$2\frac{1}{4}$ is a mixed number.

The whole number is 2.

The fraction is $\frac{1}{4}$.

Improper Fractions

An improper fraction is a fraction where the numerator is greater than or equal to the denominator.

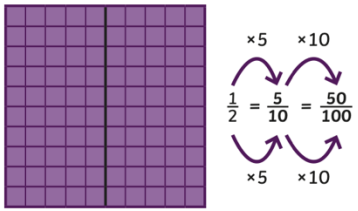
$\frac{5}{3}$ ← numerator / denominator

Equivalent Fractions:

Fractions which have the same value.

Equivalent Fractions

To find equivalent fractions, we multiply or divide the numerator and denominator by the same number.



Adding and Subtracting Fractions:

When the denominators are the same, you simply add or subtract the numerators.

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

When the denominators are not the same, find the lowest common denominator and rewrite the fractions. Then, add or subtract the numerators.

$$\frac{2}{5} + \frac{1}{10} = \frac{4}{10} + \frac{1}{10} = \frac{5}{10} = \frac{1}{2}$$

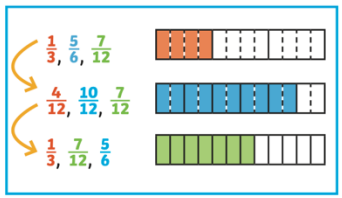
Multiplying Fractions:

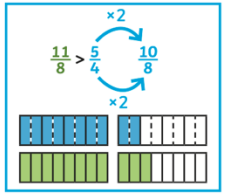
When multiplying a proper fraction, multiply the numerator by the multiplier.

$$\frac{2}{3} \times 5 = \frac{10}{3} = 3\frac{1}{3}$$

Compare and Order Fractions

We can compare and order fractions by using common denominators.





Convert an Improper Fraction to a Mixed Number

$\frac{9}{4}$ $9 \div 4 = 2r1$ $2\frac{1}{4}$

Divide the numerator by the denominator.

This shows you the whole number and the fraction.

Convert a Mixed Number to an Improper Fraction

Multiply the whole by the denominator to make an improper fraction.

$2\frac{5}{6} = \frac{12}{6} + \frac{5}{6} = \frac{17}{6}$

Add the fractions together.

Adding and Subtracting Fractions

To add or subtract fractions with denominators that are multiples of the same number, we must change one fraction to have the same denominator.

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

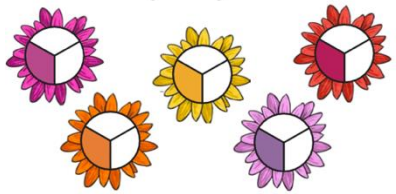
$\frac{4}{5} - \frac{3}{5} = \frac{1}{5}$

$\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$

$\frac{5}{6} - \frac{2}{3} = \frac{5}{6} - \frac{4}{6} = \frac{1}{6}$

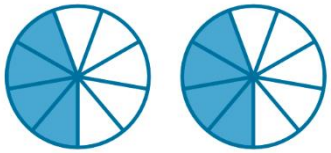
Multiply Unit Fractions by an Integer

$\frac{1}{3} \times 5 = \frac{5}{3}$



Multiply Non-Unit Fractions by an Integer

$2 \times \frac{4}{9} = \frac{8}{9}$



Tenths, Hundredths and Thousandths:

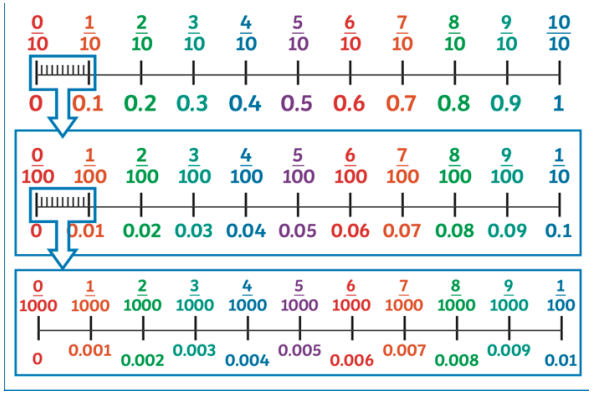
Ten	One		tenth	hundredth	thousandth
10	1	.	0.1	0.01	0.001
T	O	.	t	h	th

Round to one decimal place:

Round to a number which has no digits beyond the tenths place holder. For example, 2.3, 45.1, 70.4

Round to two decimal place:

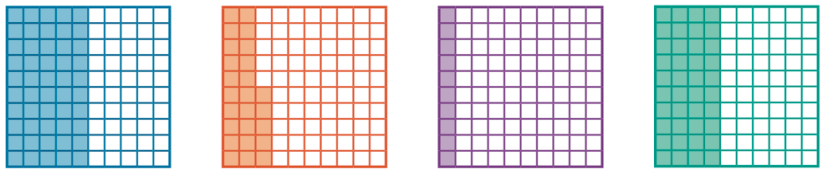
Round to a number which has no digits beyond the hundredths place holder. For example, 2.31, 45.19, 70.44



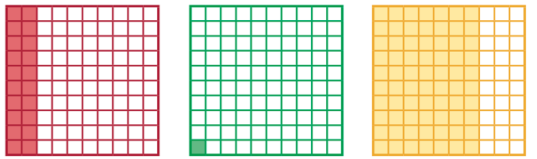
Decimal Numbers as Fractions

$0.71 = \frac{71}{100} = \frac{7}{10} + \frac{1}{100}$

$0.37 = \frac{37}{100} = \frac{3}{10} + \frac{7}{100}$



$50\% = \frac{50}{100} = \frac{1}{2} = 0.5$ $25\% = \frac{25}{100} = \frac{1}{4} = 0.25$ $10\% = \frac{10}{100} = \frac{1}{10} = 0.1$ $40\% = \frac{40}{100} = \frac{2}{5} = 0.4$



$20\% = \frac{20}{100} = \frac{1}{5} = 0.2$ $1\% = \frac{1}{100} = 0.01$ $70\% = \frac{70}{100} = \frac{7}{10} = 0.7$

Crossing the Whole

$0.82 + 0.63 = 1.45$

$2.531 - 0.6 = 1.931$