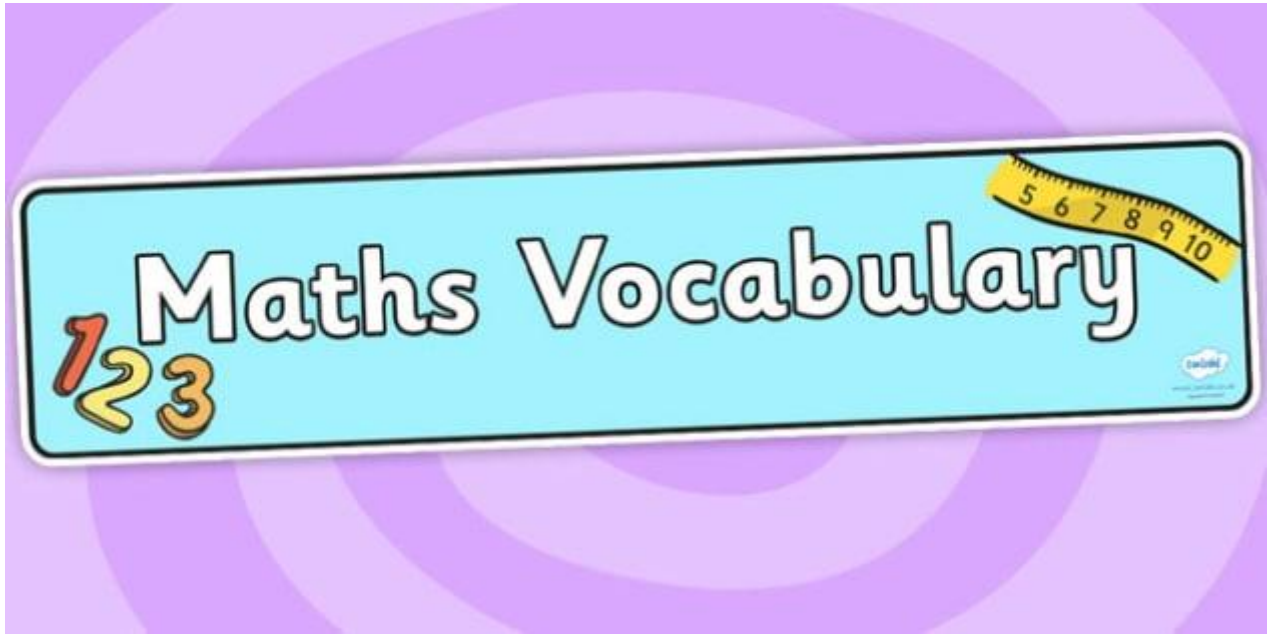


Key vocabulary for Year 6 Maths learning.

Year 6 Algebra

Algebra

A letter is used in place of a variable or unknown number.

Take a number	double it	add 3
n	2 x n	2n + 3
let's call this number 'n'	(times it by 2)	

Linear Sequence

A sequence of numbers where each number increases or decreases by the same amount.

term 1	term 2	term 3	term 4
5	7	9	11
	+2	+2	+2

Each number in the sequence is called a term.

The change between the numbers is the term-to-term rule.

Missing Numbers

When a letter is used in algebra to represent a missing value, it is called a variable.

$63 + a = 79$

Variable

An equation shows when two things are equal using the equals sign.

$45 + y = 59$

Equation

An expression is a group of numbers, operations and variables on one side of an equation.

$56 - w = 45$

Expression

The multiplication sign is not used in algebra. The number is just written in front of the variable.

$3y = 12$

The division sign is not used in algebra. A fraction line is used to show that you divide the top by the bottom.

$\frac{20}{g} = 5$

Simple Formula

A formula is an equation showing a relationship or rule.

area = length × width

Satisfy Two Variables

In an equation with two unknown numbers, there can be more than one way to satisfy the equation.

a + b = 25

24 + 1 = 25	10 + 15 = 25	20 + 5 = 25

We can record the pairs of numbers that satisfy an equation in a table.

a	24	23	22	21	20	...
b	1	2	3	4	5	...

Year 6 Fractions

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.

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

Adding and Subtracting Mixed Numbers

With mixed numbers, you could convert the mixed number into an improper fraction and then add or subtract as normal.

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

$$\frac{3}{2} + \frac{4}{3} = \frac{9}{6} + \frac{8}{6} = \frac{17}{6}$$

Once you have your final answer, change the improper fraction back to a mixed number.

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

Multiplying Fractions

$$\frac{2}{4} \times \frac{3}{6}$$

$$\frac{2}{4} \times \frac{3}{6} = \frac{6}{24}$$

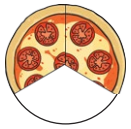
Multiply the numerators. Multiply the Denominators.

$$\frac{6}{24} = \frac{1}{4}$$

Simplify the fraction by dividing the numerator and denominator by their lowest common factor.

Dividing Fractions by a Whole Number

$$\frac{2}{3} \div 2$$



For $\frac{2}{3}$ we can imagine we have 2 out of 3 slices in a pizza.

Imagine the pizza without the plate.

Take these slices and share them between 2 plates.

We can see that each plate now has $\frac{1}{3}$ of the original pizza.

Decimal Place Value Chart

	Millions	Whole
	Hundred thousands	
	Ten thousands	
3	Thousands	
6	Hundreds	
8	Tens	
4	Ones	
.	Decimal Point	
2	Tenths	Parts
6	Hundredths	
	Thousandths	
	Ten-thousandths	
	Hundred thousandths	
	Millionths	

Year 6 Decimals

Multiplying Decimals by Whole Numbers

1

$$\begin{array}{r} 3.45 \\ \times\ 6 \\ \hline \\ \hline \end{array}$$

Write the numbers above each other in the correct columns.

2

$$\begin{array}{r} 3 \\ 3.45 \\ \times\ 6 \\ \hline 0 \end{array}$$

Multiply the hundredths digit in the decimal number by the one-digit number. 5 hundredths × 6 ones = 30 hundredths = 3 tenths and 0 hundredths. Write 0 in the answer section and regroup the 3 tenths by writing 3 above the tenths column.

3

$$\begin{array}{r} 2\ 3 \\ 3.45 \\ \times\ 6 \\ \hline 7\ 0 \end{array}$$

Multiply the tenths digit in the decimal by the one-digit number and add any regrouped tenths. 4 tenths × 6 ones = 24 tenths + 3 tenths = 27 tenths = 2 ones and 7 tenths. Write 7 in the answer section and regroup the 2 ones by writing 2 above the ones column. Write the answer in the provided section.

4

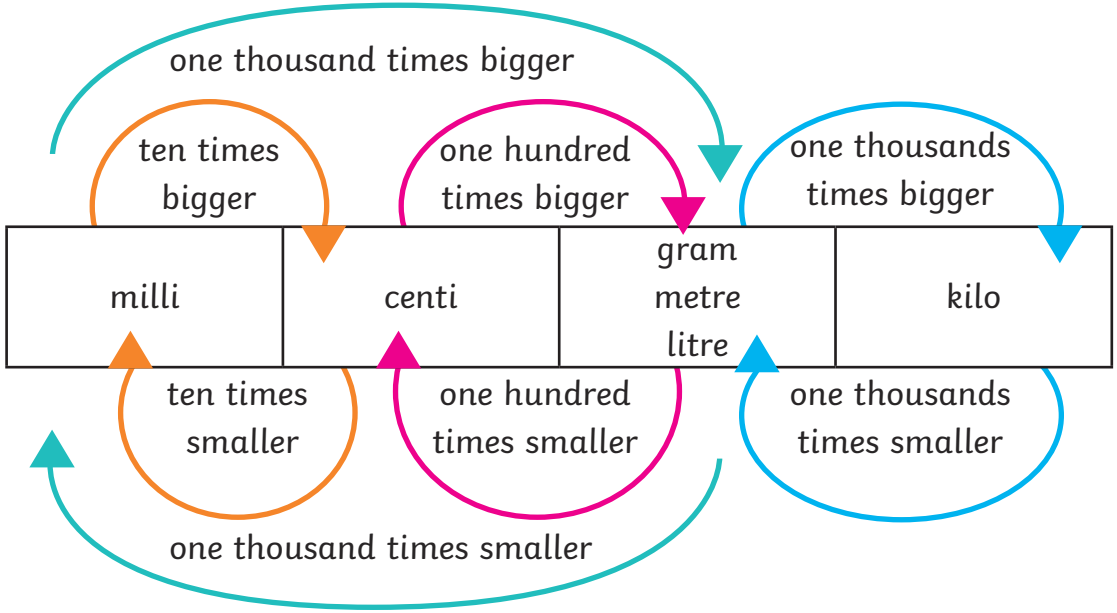
$$\begin{array}{r} 2\ 3 \\ 3.45 \\ \times\ 6 \\ \hline 20.70 \end{array}$$

Multiply the ones digit in the decimal number by the one-digit number and add any regrouped ones. 3 ones × 6 ones = 18 ones + 2 ones = 20 ones = 2 tens and 0 ones. Write the answer in the provided section.

5 $3.45 \times 6 = 20.70$

Year 6 Measurement

Metric Measurements

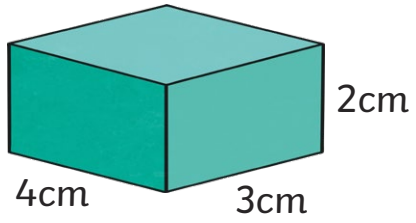


kilo	thousand	one thousand times bigger (than gram/metre/litre)
gram/metre/litre		
centi	hundredth	one hundred times smaller (than gram/metre/litre)
milli	thousandth	one thousand times smaller (than gram/metre/litre)

Volume

3D shapes have volume.

length × height × depth = volume



4cm × 2cm × 3cm = 24cm³

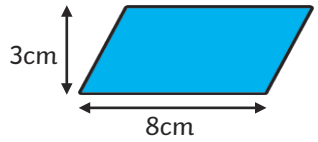
1 mile = 1.6km

Finding the Area of a Parallelogram

To find the area of parallelogram: multiply the **base** by the **height**

8cm × 3cm = 24cm²

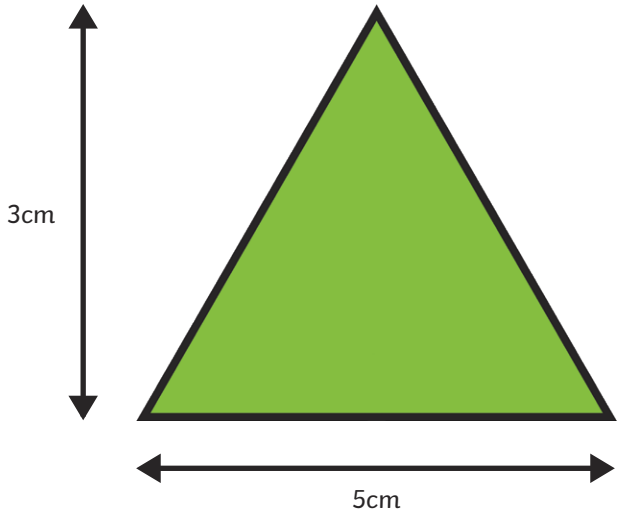
See how the parallelogram can be changed into a rectangle



Year 6 Measurement

Finding the Area of a Triangle

To find the area of a triangle:
multiply the **base** × the **height** and **divide** the answer by **2**



The area:

5cm × 3cm = **15cm²**

15cm ÷ 2 = **7.5cm²**

area = **7.5cm²**

Year 6 Multiplication and Division

Factors and Multiples

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...

A factor is a number that is multiplied by another number to get a product.

For example, 12 ÷ **1** = **12**, 12 ÷ **2** = **6**, 12 ÷ **3** = **4**

The factors of 12 are: 1, 2, 3, 4, 6 and 12.

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.

Common Multiple

A number which is a multiple of a set of numbers. For example, 16 is a common multiple of 2, 4 and 8.

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	94	95	96	97	98	99	100

Year 6 Multiplication and Division

Long Multiplication

Multiplying by a Two-Digit Number

154 × 26

1 Write the numbers above each other in the correct columns.

```
 1 5 4
×  2 6
-------
```

2 First, multiply the ones in the three-digit number by the ones in the two-digit number.

4 ones × 6 ones = 24 ones = 2 tens and 4 ones.

Write 4 in the answer section and regroup the 2 tens by writing 2 above the tens column.

```
   2
 1 5 4
×  2 6
-------
     4
```

3 Next, multiply the tens in the three-digit number by the ones digits in the two-digit number and add any regrouped tens.

5 tens × 6 = 30 tens + 2 tens = 32 tens = 3 hundreds and 2 tens

Write 2 in the answer section and regroup the 3 hundreds by writing 3 above the hundreds column.

```
 3 2
 1 5 4
×  2 6
-------
   2 4
```

4 Finally, multiply the hundreds in the three-digit number by the ones digits in the two-digit number and add any regrouped hundreds.

1 hundred × 6 = 6 hundreds + 3 hundreds = 9 hundreds

Write 9 in the answer section.

```
 3 2
 1 5 4
×  2 6
-------
 9 2 4
```

5 Cross out any previous regroupings.

In the next section, multiply the ones in the three-digit number by the tens in the two-digit number.

Because the calculation involves multiplying by 20, a zero needs to be placed in the right-hand column as a place holder.

4 ones × 2 tens = 8 tens

Write 8 in the answer sections.

```
 ~~3~~ ~~2~~
 1 5 4
×  2 6
-------
 9 2 4
 8 0
```

Year 6 Multiplication and Division

Long Multiplication

Multiplying by a Two-Digit Number

154 × 26

6 Multiply the tens in the three-digit number by the tens in the two-digit number and add any regrouped hundreds.

5 tens × 2 tens = 1 thousand

Write 0 in the answer section and regroup the 1 thousands by writing a 1 above the thousands column.

7 Multiply the hundreds in the three-digit number by the tens in the two-digit number and add any regrouped thousands.

1 hundred × 2 tens = 2 thousands + 1 thousand = 3 thousands

Write 3 in the answer section.

8 Combine the totals using regrouping if required.

9 **154 × 26 = 4004**

```
 1 3 2
   1 5 4
 ×   2 6
 -------
   9 2 4
   0 8 0
 -------
```

```
 1 3 2
   1 5 4
 ×   2 6
 -------
   9 2 4
 3 0 8 0
 -------
```

```
 1 3 2
   1 5 4
 ×   2 6
 -------
   9 2 4
 3 0 8 0
 4 0 0 4
 -------
 1 1
```

Year 6 Multiplication and Division

Long Division

Dividing by a Two-Digit Number Resulting in a Decimal Answer

591 ÷ 12

1

answer section

```
   4
12 | 5 9 1
     4 8
     -----
     1 1 1
```

First, work out how many 12s there are in 59. The answer to this question is 4, which is written above the 9. We then write the product of 4 and 12 (48) under the 59 and subtract, giving 11. The 1 is then brought down and written next to 11 to make 111.

2

answer section

```
   4 9
12 | 5 9 1
     4 8
     -----
     1 1 1
     1 0 8
     -----
       3
```

Next, work out how many 12s there are in 111. The answer to this question is 9, which is written above the 1. Then, write the product of 9 and 12 (108) under 111 and subtract it, giving 3.

3

answer section

```
   4 9 .
12 | 5 9 1 . 0 0
     4 8
     -------
     1 1 1
     1 0 8
     -------
       3 : 0
```

Extend 591 into decimals to continue the process of long division. The 0 in the tenths place is then brought down and written next to the 3 to make 30.

4

answer section

```
   4 9 . 2
12 | 5 9 1 . 0 0
     4 8
     -------
     1 1 1
     1 0 8
     -------
       3 . 0
       2 . 4
       -----
         6 0
```

Next, work out how many 12s there are in 30. The answer to this question is 2, which is written above the 0 in the tenths place. Then, write the product of 2 and 12 (24) under 30 and subtract it, giving 6. The 0 is then brought down and written next to 6 to make 60.

5

answer section

```
   4 9 . 2 5
12 | 5 9 1 . 0 0
     4 8
     -------
     1 1 1
     1 0 8
     -------
       3 . 0
       2 . 4
       -----
         . 6 0
         . 6 0
         -----
           0
```

Next, find out how many 12s there are in 60. The answer to this question is 5, which is written above the 0 in the hundredths place. Then, write the product of 5 and 12 (60) under 60 and subtract it, giving zero.

591 ÷ 12 = 49.25

Year 6 Multiplication and Division

Short Division

Dividing by a Two-Digit Number

5284 ÷ 12

1

$$12\overline{)\,5\ {}^{5}2\ \ 8\ \ 4}$$

First we divide 5 (thousands) by 12. This gives a result of 0 with a remainder of 5. The remainder 5 (thousands) is exchanged for 50 hundreds and placed into the hundreds column. This is shown by a small 5 in front of the existing 2 hundreds to make 52 hundreds.

2

$$\begin{array}{r} \ \ 4 \\ 12\overline{)\,5\ {}^{5}2\ {}^{4}8\ \ 4} \end{array}$$

Next, we divide 52 (hundreds) by 12. This gives a result 4 (hundreds) remainder 4. The remainder 4 (hundreds) is exchanged for 40 tens and placed into the tens column. This is shown by a small 4 in front of the existing 8 tens to make 48 tens. The 4 is written in the hundreds position of the answer above the line.

3

$$\begin{array}{r} \ \ 4\ \ 4 \\ 12\overline{)\,5\ {}^{5}2\ {}^{4}8\ \ 4} \end{array}$$

Next, we divide 48 (tens) by 12. This gives a result of 4. The 4 is written in the tens position of the answer above the line.

4

$$\begin{array}{r} \ \ 4\ \ 4\ \ 0 \\ 12\overline{)\,5\ \ 2\ \ 8\ \ 4} \end{array}$$

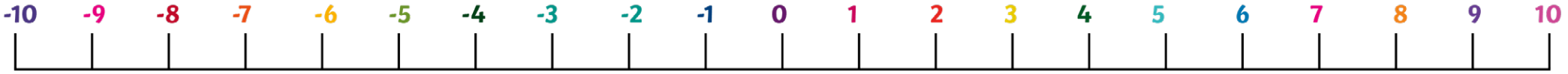
Next, divide 4 (ones) by 12. This cannot be done, so there are four remaining. A zero is placed in the ones answer section as well as remainder 4.

5284 ÷ 12 = 440 r4

Year 6 Number and Place Value

Count Forwards and Backwards through 0

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



Negative Numbers

Positive Numbers

Rounding to 10

Rounding to the nearest 10

239, 238, 237, 236, 235, 234, 233, 232, 231

Round up to 240

Round down to 230

Remember: The red digit is the one to consider.

Rounding to 100

Rounding to the nearest 100

7399, 7398, ..., 7351, 7350, 7349, 7348, ..., 7302, 7301

Round up to 7400

Round down to 7300

Remember: The red digit is the one to consider.

Rounding to 1000

Rounding to the nearest 1000

5999, 5998, ..., 5501, 5500, 5499, 5498, ..., 5002, 5001

Round up to 6000

Round down to 5000

Remember: The red digit is the one to consider.

Rounding to 10 000

Rounding to the nearest 10 000

29 999, 29 998, ..., 25 001, 25 000, 24 999, 24 998, ..., 20 002, 20 001

Round up to 30 000

Round down to 20 000

Remember: The red digit is the one to consider.

Rounding to 100 000

Rounding to the nearest 100 00

699 999, 699 998, ..., 650 001, 650 000, 649 999, 649 998, ..., 600 002, 600 001

Round up to 700 000

Round down to 600 000

Remember: The red digit is the one to consider.

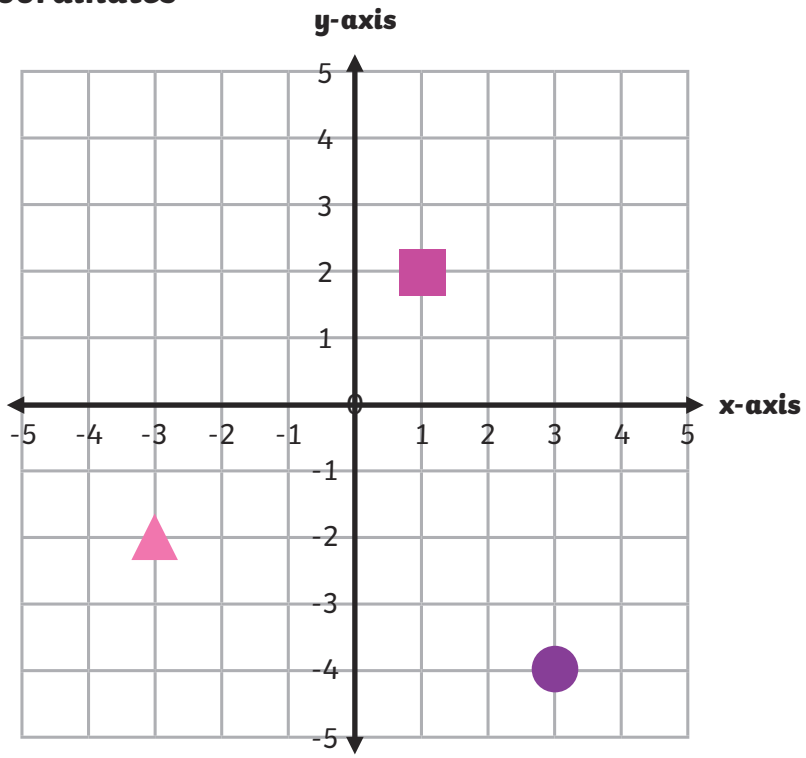
twinkl

visit twinkl.com

twinkl Quality Standard Approved

Year 6 Position and Direction

Coordinates



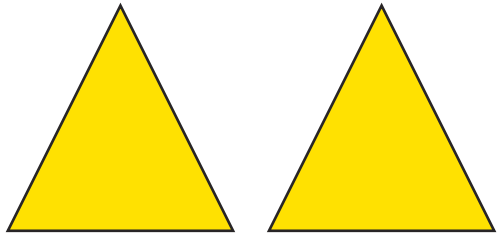
● = (3,-4) ■ = (1,2) ▲ = (-3,-2)

Coordinates can use positive and negative numbers. Whether positive or negative, always write the x-axis coordinate followed by the y coordinate.

Look at the circle point. It is 3 squares along and 4 down. We write this coordinate as (3,-4).

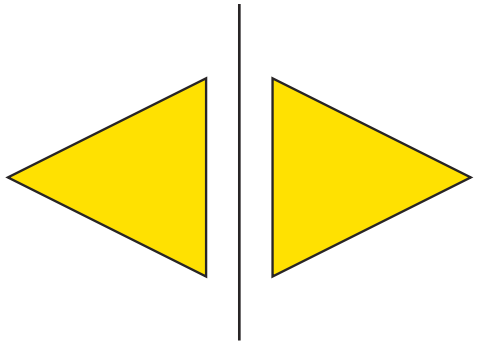
Translate

A shape is moved without rotating or resizing.



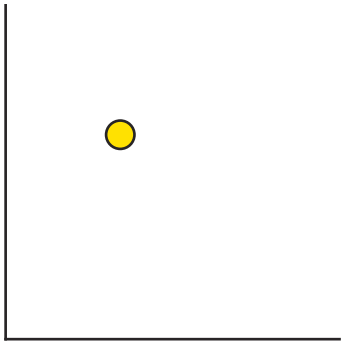
Reflect

A shape is reflected about a line when it is flipped over the mirror line. The shape's size stays the same.



Point

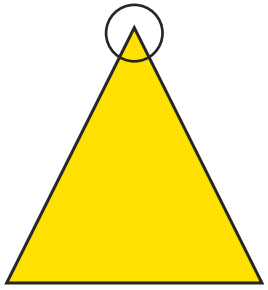
A point has no size, only an exact location.



Vertex/Vertices

A vertex is the corner of a shape.

Vertices is more than one vertex.

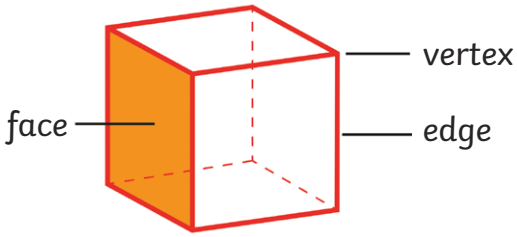


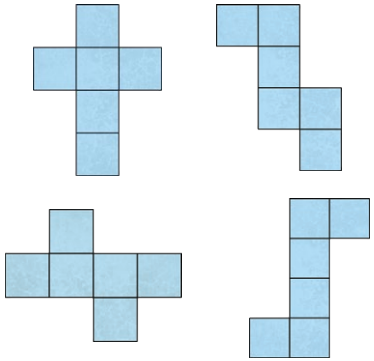
Year 6 Properties of Shape

Solids and Their Nets

cube

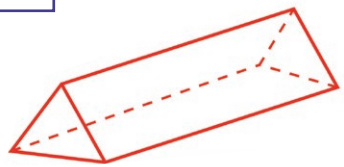
faces: 6
edges: 12
vertices: 8





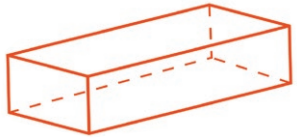
triangular prism

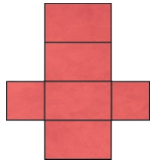
faces: 5
edges: 9
vertices: 6



cuboid

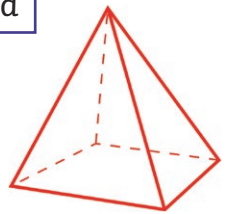
faces: 6
edges: 12
vertices: 8





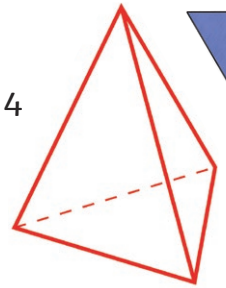
square-based pyramid

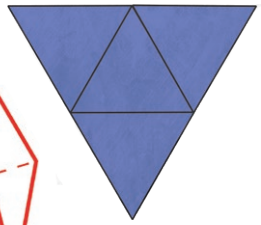
faces: 5
edges: 8
vertices: 5



triangular-based pyramid

faces: 4
edges: 6
vertices: 4





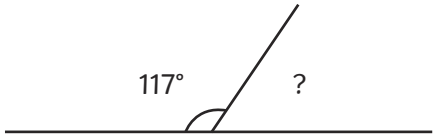
Finding Unknown Angles in Shapes

Triangle		180°
Quadrilateral		360°
Pentagon		540°
Hexagon		720°
Heptagon		900°
Octagon		1080°

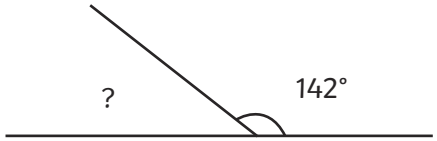
Year 6 Properties of Shape

Finding Missing Angles

Angles on a straight line always add up to 180°



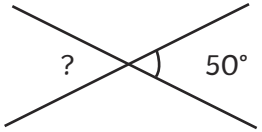
180° - 117° = 63°
The missing angle is 63°



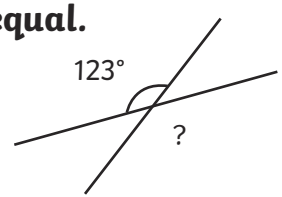
180° - 142° = 38°
The missing angle is 38°

Missing Vertically Opposite Angles

Opposite angles are equal.

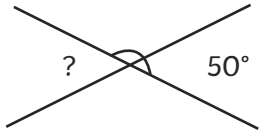


The missing angle is 50°

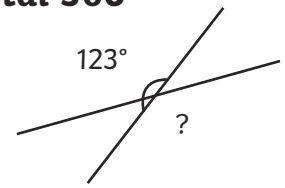


The missing angle is 123°

Angles around a point total 360°

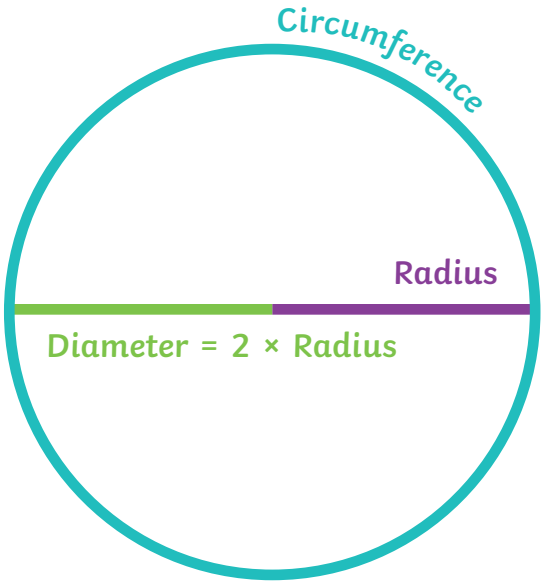


The two known opposite angles total 100°.
360° - 100° = 260°
260° ÷ 2 = 130°
The missing angle is 130°.



The two known opposite angles total 246°.
360° - 246° = 114°
114° ÷ 2 = 57°
The missing angle is 57°.

Parts of a Circle



Year 6 Ratio and Proportion

Ratio

Ratio shows the relative sizes of two or more values.

The ratio of yellow spots to blue spots is 3:2.

Proportion

Proportion is a part or share in relation to the whole.

$\frac{3}{5}$ are yellow spots.

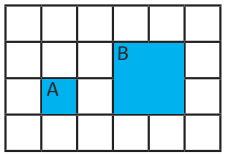
$\frac{2}{5}$ are blue spots.

Scale and Scale Factor

Scaling is used to enlarge or reduce the size of a shape based on the scale factor.

The scale factor represents the ratio of the lengths of the sides of the shape.

Shape A has been enlarged by scale factor 2 as the length and width of the shape has been doubled.



Solve Ratio and Proportion Problems Involving Unequal Quantities

In a supermarket, washing powder is sold in three sizes:

Standard 2.5kg
Price £3

Large 10kg
Price £10

Mega 20kg
Price £18

What would be the cheapest way to buy 20kg of washing powder?

Standard:

20kg ÷ 2.5kg
= 8 boxes needed,
8 - 2 (free)
= 6 boxes
6 × £3 =

£18 for 20kg

Large:

$\frac{1}{5}$ of £10 = 10 ÷ 5
= £2 (reduction)
£10 - £2 = £8;
2 boxes needed:
£8 × 2 =

£16 for 20kg

Mega:

£18 - £1.50 =
£16.50 for 20kg

Year 6 Ratio and Proportion

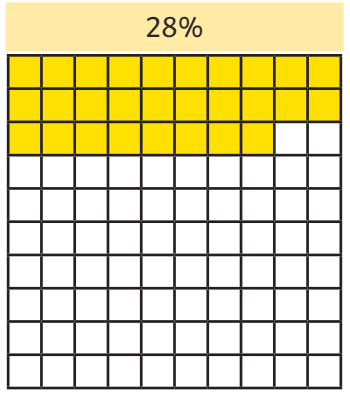
Use one of these methods to find a percentage of an amount.

Convert to a Decimal	Finding 10%	Convert to a Decimal
Find 30% of 80	Find 70% of 60	Find 18% of 250
1. Convert the percentage into a decimal. **30 ÷ 100 = 0.3**	1. Find 10% by dividing the amount by 10. **60 ÷ 10 = 6**	1. Find 1% by dividing the amount by 100. **250 ÷ 100 = 2.5**
2. Multiply the amount by the decimal. **80 x 0.3 = 24**	2. Multiply this answer by the number of tens in the percentage. **6 × 7 = 42**	2. Multiply this answer by the number of the percentage. **2.5 × 18 = 45**
30% of 80 = 24	**70% of 60 = 42**	**30% of 80 = 24**

Percent (%)

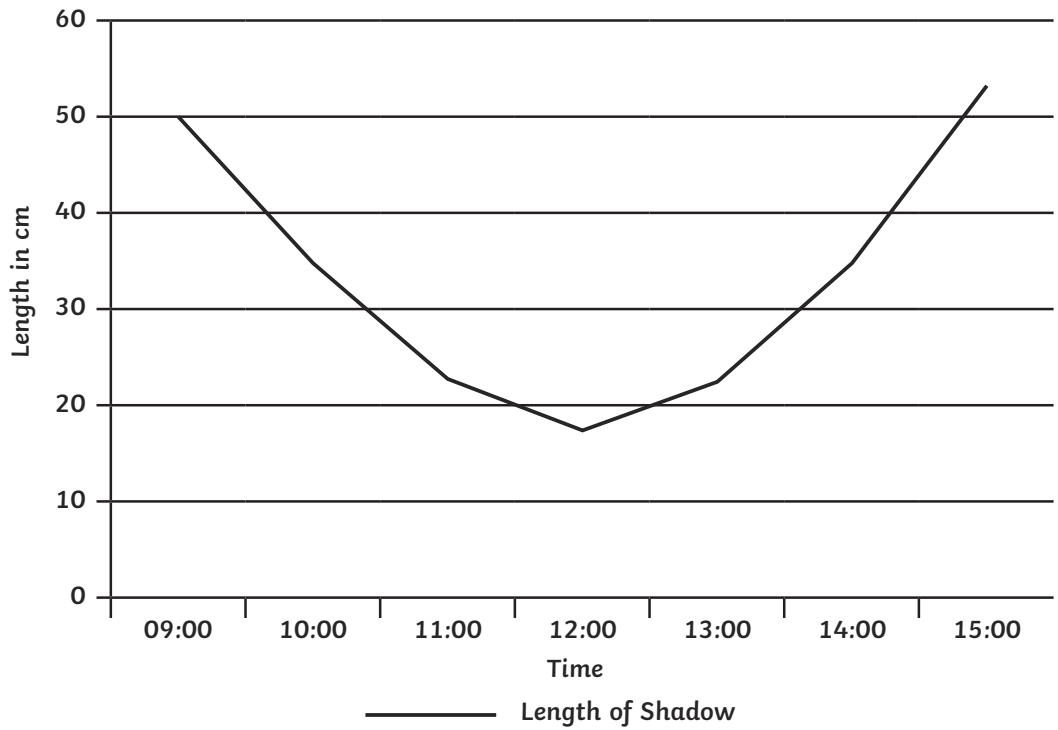
Percent means 'out of every 100'.

28% means 28/100.



Year 6 Statistics

Continuous Data



Data that is measured and, therefore, can take on infinite values is continuous.

In continuous data, values between whole numbers can be counted.

In this investigation, it is the length of the shadow that is being measured. This is continuous data because it is possible to record the length as 20.5cm, etc.

Mean

The mean is the average.

5, 5, 6, 4, 7, 3

Add all of the values together.

5 + 5 + 6 + 4 + 7 + 3 = 30

Divide the total by the number of values that you added together.

30 ÷ 6 = 5

The mean is **5**.

Pie Chart

Pie charts represent data in a circle divided into segments.

A Pie Chart to Show Children's Favourite Fruit

Key

Blueberries

Bananas

Apples

Raspberries

24 children were asked in total.

Each segment is a different colour or shade, and a key must be included.