

# Year 6 Maths Knowledge Organisers

## Spring



Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Half term	Week 1	Week 2	Week 3	Week 4	Week 5	
4OPs <a href="#">Place value</a> + & - X & ÷	<a href="#">Area, perimeter and volume</a>		<a href="#">Statistics</a>	<a href="#">Algebra</a>	<a href="#">Conversion/time</a>	<a href="#">Shape 1</a>  <a href="#">Shape 2</a>			<a href="#">proportion</a> <a href="#">Ratio and</a>	Revision <ul style="list-style-type: none"> <li>• <a href="#">Place value</a></li> <li>• <a href="#">+ &amp; -</a></li> <li>• <a href="#">X &amp; ÷</a></li> <li>• <a href="#">Algebra</a></li> <li>• <a href="#">Shape 1</a></li> <li>• <a href="#">Shape 2</a></li> <li>• <a href="#">Conversion/time</a></li> <li>• <a href="#">Statistics</a></li> </ul>			

Click on a maths area



## Vocabulary

- 1 more
- 1 less
- Greater than
- Less than
- Equal
- Equivalent
- Millions
- Thousands
- Hundreds
- Tens
- Ones
- Zero
- Place Value
- Order
- Round
- Negative
- Number
- Digit

## More or Less

	+1,000
<b>Number</b>	<b>1,000 more</b>
4,600	5,600
6,643	7,643
8,021	9,021
	-1,000

## Place Value

Y5/6



### Rounding

Round 3,576,219 to the nearest million

Identify the millions

3,576,219

Look at the digit beside the millions

**Rounding rhyme – 0,1,2,3,4 stays the number before**

**5,6,7,8,9 rounds up on the number line**

So, rounding 3,576,219 to the nearest million will mean it will round up on the number line because of the 5 digit in the hundred thousands.

4,000,000

### Roman Numerals

I = 1

Value = 5

Xylophones = 10

Like = 50

Cows = 100

Do = 500

Milk = 1000

• Bridging numbers

V, L and D (you can't have 2 together)

• Top rule – you cannot have more than 3 of the same letter in a row

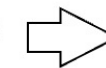
MM XXIII

**MMXXIII = 2023**

## Ordering

Order from largest to smallest

1,009,909 → 1<sup>st</sup>  
 1,023,065 → 2<sup>nd</sup>  
 1,009,099 → 3<sup>rd</sup>  
 1,230,650 → 4<sup>th</sup>



• Look at the largest digit first (millions)

Same { 1,230,650  
 1,009,099 }

• Then go to the next digit. If the digit is greater, then the number is larger

Larger { 1,230,650  
 1,009,099 }

## Ordering Decimals

Order starting with the smallest

1.25    0.99    1.025    0.009

Add place holders (write zeros) and follow the steps above

1.250 → 1.250

0.990 → 1.025

1.025 → Grater 0.990

0.009 → Grater number 0.009

Greater number

Grater number

### Recognise value of digits

What is the value of 4?

1,042,851

Move from the ones across writing the value of the column above

M	H	T	Th	H	T	O
1	0	4	2	9	5	1

Forty thousand

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## Vocabulary

- Add
- Plus
- Total
- Sum
- Altogether
- Equals
- Digit
- Tens
- Ones
- Hundreds
- Subtract
- Minus
- Take away
- Regroup

## Add and subtract mentally

1. 3 digit and ones

Circle the ones and subtract

$$\begin{array}{r} 384 - 3 = 381 \\ 4 - 3 = 1 \end{array}$$



2. 3-digits and tens

Circle the tens and add

$$\begin{array}{r} 839 + 60 = 899 \\ \underline{3} + 6 = 9 \end{array}$$

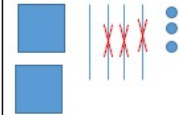
3. 3-digit and hundreds

Circle the hundreds

$$\begin{array}{r} 649 - 400 = 249 \\ 6 - 4 = 2 \end{array}$$

Prove all with resources and drawings in school. E.g.

$$243 - 30 = 213$$



## Column addition

### example

	4	5	8	6	4
+	2	3	4	9	7
	6	9	3	6	1
		1	1	1	

## Column addition (without regrouping)

$$241 + 52 = 293$$

- Write in a column
- Make sure each digit is in the correct column

Wrong column as fifty should be in the tens column

HTO	241
+52	—

HTO  
241

❖ Start with the ones.

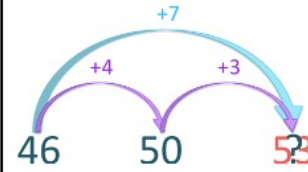
$$1 + 2 = 3$$

❖ Then go to the tens.

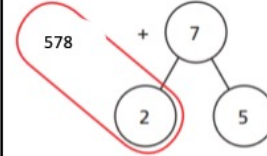
$$\begin{array}{r} + 52 \\ \hline 293 \end{array}$$

## Mental addition and subtraction bridging

$$46 + 7 = 53$$



❖ Get to the next ten or hundred and then add the rest.



E.g.  $394 - 40 =$   
 $404 + 30 = 434$

$$580 + 5 = 585$$

## Addition and subtraction Y5/6



## Column addition (with regrouping)

$$2482 + 3138 = 620$$

- Start with ones,  $2 + 8 = 10$   
So regroup by carrying  
The 1 to the tens column
- $8 + 3 + 1 = 12$   
Don't forget to add the 1  
That you regrouped!
- $4 + 1 + 1 = 6$

4. Add the Ths

Th HTO	2482
+ 3138	—
5620	

Apply with greater numbers up to 1

## Column subtraction example

	3	5	<del>7</del> <sup>6</sup>	<del>4</del> <sup>13</sup>	<del>2</del> <sup>1</sup>
-		3	4	7	6
	3	2	2	6	6

## Column subtraction (with regrouping)

$$875 - 287 = 589$$

- Start with ones,  $5 - 7$ , you cannot do so regroup by taking one ten from the 7, leaving 6 tens, and put in the ones column to make 15.  $15 - 6 = 9$
- Next, the tens.  $6 - 8$ , you cannot do so regroup by taking one of the hundreds, leaving 7 hundred, and put it in the tens column to make 16.  $16 - 8 = 8$
- Finally,  $7 - 2 = 5$

HTO	875
- 287	—
589	

You cannot do  $5 - 7$  so go to the tens column. Take a ten to leave 6 tens and make 15 in the ones column.



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## Vocabulary

- Multiply
- Multiplication
- Lots of
- Times
- Division
- Grouping
- Sharing
- Arrays

## Short division

$$217 \div 7 = 31$$

- This division is quicker because you are dividing by a times table up to 12. This example is dividing by 7.
- Write in a bus stop

$$\begin{array}{r} 7 \overline{)217} \end{array}$$

- Look at the first digit in 217. How many 7s are in 2? Zero.

$$\begin{array}{r} 0 \phantom{0} \\ 7 \overline{)217} \end{array}$$

- Look at the next digit with the 2. How many 7s in 21? Three.

$$\begin{array}{r} 031 \\ 7 \overline{)217} \end{array}$$

- How many 7s in 7? One.

## Highest common factor (HCF)

What is a factor?

- A factor is a number that goes into another number.
- LCF is when you compare 2 or more numbers, list their factors and identify what factor is common between them. The highest value is the HCF.

Top tip – list the factors as pairs and start from 1, then go to 2, 3, etc.

Factors for 16	
1	16
2	8
4	4

Factors for 12	
1	12
2	6
3	4

What is the HCF for 16 and 12?

4 is the HCF.

2 is a common factor but it isn't the highest.

## Order of operations

Remember **BODMAS**

**B** – brackets

**O** – orders (squared or cubed)

**D** – division

**M** – multiplication

**A** – addition

**S** – subtraction

Follow this order to complete calculations correctly.

E.g.  $(16-10) \div 3 = ?$

1. Brackets 1<sup>st</sup>, so  $16-10=6$

2. Then,  $6 \div 3 = 2$

So,  $(16-10) \div 3$  equals 2.

## Apply times tables

If you know  $2 \times 8 = 16$ , then you know...

$$2 \times 8 = 16$$

$$20 \times 8 = 160$$

$$2 \times 80 = 160$$

20 has a 0 so your answer will have 1 zero as it is 10x greater

**Top tip** – look at the number of zeros. This tells you if you need to write any zeros in your answer.

In total, 20 and 80 have 2 zeros so the answer will have 2 zeros as it is 100x greater

$$20 \times 80 = 1600$$

## Column multiplication

$$324 \times 13$$

- Write the calculation in a column. Make sure the digits are in the correct column.

e.g. **HTO**

$$\begin{array}{r} 324 \\ \times 13 \\ \hline \end{array}$$

**HTO**

$$\begin{array}{r} 324 \\ \times 13 \\ \hline \end{array}$$

**HTO**

$$\begin{array}{r} 324 \\ \times 13 \\ \hline \end{array}$$

$$\begin{array}{r} 324 \\ \times 13 \\ \hline \end{array}$$

- Start with multiplying the 3 in 13 with the ones column. So,  $3 \times 4 = 12$ . Carry the 1 in the number 12 into the tens column.

- Move onto  $3 \times 2$  (the tens column) and **add the extra 1** that you carried.  $3 \times 2 = 6$ , add  $1 = 7$

- Then,  $3 \times 3$  (in the hundreds column), which is 9

- You have multiplied the 3 in 13, now move onto the 1 ten in 13.

- Put a zero (0) in the ones column as we are x by 10 not 1.

- Then follow the same process described in the previous Steps but multiplying each digit by 1 instead ( $1 \times 4, 1 \times 2, 1 \times 3$ )

- Finally,  $972 + 3240 = 4212$ . Use the column method (see the addition and subtraction KO for support)

$$\begin{array}{r} 324 \\ \times 13 \\ \hline 972 \\ \phantom{972} 324 \\ \hline 4212 \end{array}$$

$$\begin{array}{r} 324 \\ \times 13 \\ \hline 972 \\ \phantom{972} 324 \\ \hline 4212 \end{array}$$

$$\begin{array}{r} 324 \\ \times 13 \\ \hline 972 \\ \phantom{972} 324 \\ \hline 4212 \end{array}$$

$$\begin{array}{r} 324 \\ \times 13 \\ \hline 972 \\ \phantom{972} 324 \\ \hline 4212 \end{array}$$

$$\begin{array}{r} 324 \\ \times 13 \\ \hline 972 \\ \phantom{972} 324 \\ \hline 4212 \end{array}$$

$$\begin{array}{r} 324 \\ \times 13 \\ \hline 972 \\ \phantom{972} 324 \\ \hline 4212 \end{array}$$

## Multiplication and division Y5/6



### Long division

$$6786 \div 29 = 234$$

$$\begin{array}{r} 29 \overline{)6786} \end{array}$$

- You don't know the 29x table? Calculate the first 5 numbers in the 29x table by adding 29 five times.

1x	29	58	87	116	145
	+29	+29	+29	+29	+29
2x	58	87	116	145	174

$$2. \begin{array}{r} 29 \overline{)6786} \end{array}$$

How many 29s in 67? Zero. So go to the next digit to make 67 and write 0.

$$4. \begin{array}{r} 023 \\ 29 \overline{)6786} \end{array}$$

How many in 98? Three.  $98-87=11$

### Important facts

Anything  $\times 0$  is always 0 as you do not have any groups.

$$3. \begin{array}{r} 02 \\ 29 \overline{)6786} \end{array}$$

How many 29s in 67? Use your notes to help. Two times.  $67-58=9$ . Carry the 9 to the next column.

$$5. \begin{array}{r} 0234 \\ 29 \overline{)6786} \end{array}$$

How many 29s in 116? Four times.

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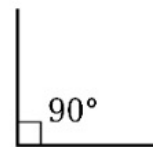
## Vocabulary

- Angle
- Right Angle
- Acute Angle
- Obtuse Angel
- Reflex Angle
- Triangle
- Isosceles Triangle
- Scalene Triangle
- Right Angled Triangle
- Equilateral Triangle
- Diameter
- Vertically opposite
- Angles

[Click here for Shape 2](#)

[Click here to return to selection page](#)

## The Angles



Right Angles are  $90^\circ$



Obtuse angles are greater than  $90^\circ$  but less than  $180^\circ$

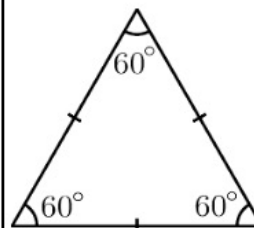


Acute angles are less than  $90^\circ$



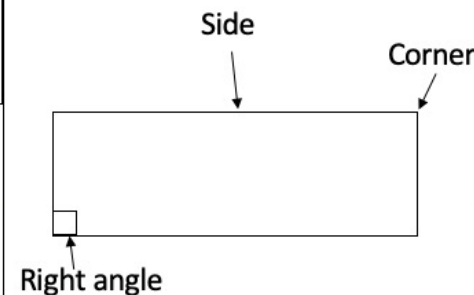
Reflex angles are greater than  $180^\circ$

## Angles in a triangle add up to $180^\circ$

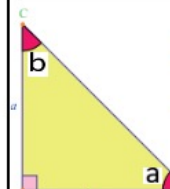


$$60^\circ \times 3 = 180^\circ$$

## Labelling a 2D shape

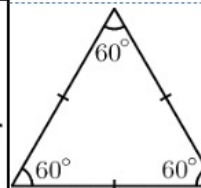


## Different triangles



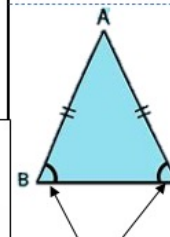
**Right angled triangle**

1. It has an angle measuring  $90^\circ$ , which is shown by the square
2. The other 2 angles add up to  $90^\circ$  ( $a + b = 90^\circ$ )



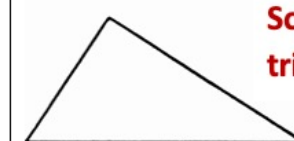
**Equilateral triangle**

1. All angles are  $60^\circ$
2. All sides are the same



**Isosceles triangle**

1. Two angles are equal
2. Two lengths are equal



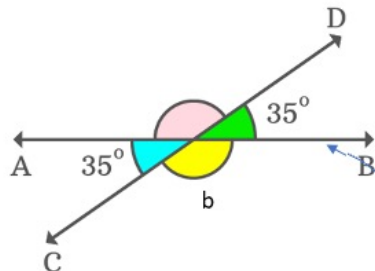
**Scalene triangle**

1. All angles are different
  2. All lengths are different
- \* Remember all angles in a triangle add up to  $180^\circ$ !

## Vertically opposite angles

Vertically opposite angles are always the same

e.g.



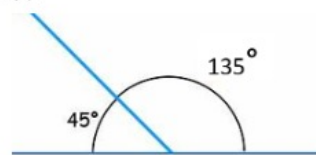
1. If one side is  $35^\circ$  then the other side is  $35^\circ$
2.  $35^\circ$  and  $b$  are on a straight line so have a total of  $180^\circ$  altogether. Subtract 35 from  $180^\circ$  to find  $b$ .  
 $180^\circ - 35^\circ = 145^\circ$

## Shape Y5/6

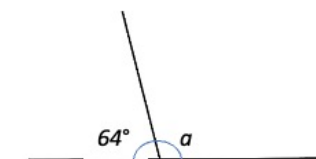
(Part 1)



Angles on a straight line add up to  $180^\circ$



$$135^\circ + 45^\circ = 180^\circ$$

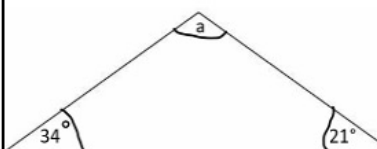


If there is a missing angle, subtract the angles you know from  $180^\circ$

$$180^\circ - 64^\circ = 116^\circ$$

$$a = 116^\circ$$

## Finding missing angles

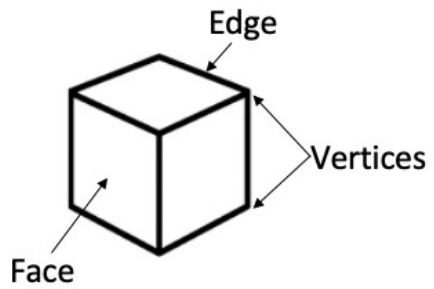


1. Add together the angles you know  
 $34^\circ + 21^\circ = 55^\circ$
2. Subtract this total from 180  
 $180^\circ - 55^\circ = 125^\circ$   
 $a = 125^\circ$

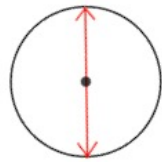
## Vocabulary

- 3D shapes
- Cube
- Cuboid
- Sphere
- Square based pyramid
- Tetrahedron
- Triangular prism
- Vertices
- Edges
- Faces
- Angles
- Degrees
- Radius
- Diameter
- Volume

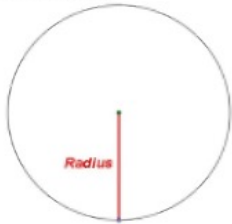
## Parts of a 3D shape



## Radius and diameter

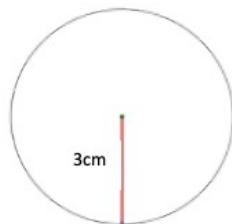


Diameter is the distance from one side of the circle to the opposite side of the circle.

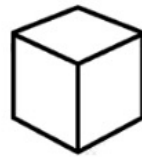


Radius is the distance from the middle of the circle to the side.

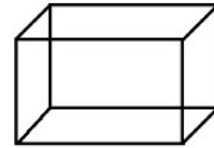
The diameter is twice as long as the radius



Radius = 3cm  
Diameter = 6 cm

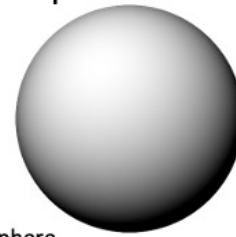


Cube  
Faces = 6  
Vertices = 8  
Edges = 12

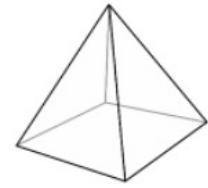


Cuboid  
Faces = 6  
Vertices = 8  
Edges = 12

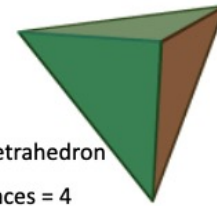
## Shapes



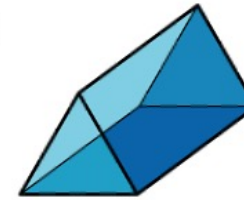
Sphere  
Faces = 1  
Vertices = 0  
Edges = 0



Square based pyramid  
Faces = 5  
Vertices = 5  
Edges = 8



Tetrahedron  
Faces = 4  
Vertices = 4  
Edges = 6



Triangular prism  
Faces = 5  
Vertices = 6  
Edges = 9

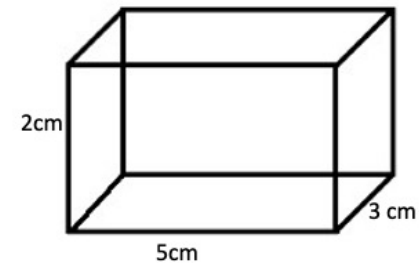
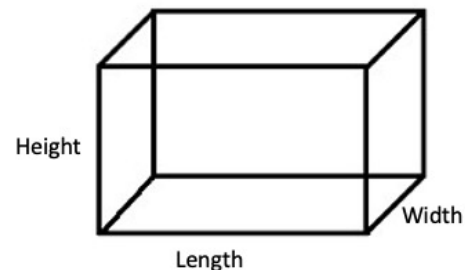
## Shape Y6 (Part 2)

## Volume

Volume is the 3D space something can hold

Volume = length x width x height

The units in volume always end in <sup>3</sup> for cubed (e.g. cm<sup>3</sup>)

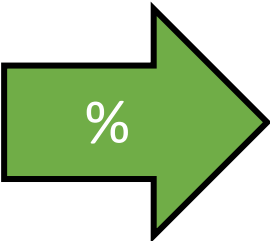


$$5 \times 3 \times 3 = 12\text{cm}^3$$
$$6 \times 2 = 12\text{cm}^3$$



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### Vocabulary

- Fraction
- Part
- Whole
- Equal
- Share
- Half
- Quarter
- Third
- Equivalent
- Numerator
- Denominator
- Proper Fraction
- Improper Fraction
- Factor
- Highest Common Factor
- Lowest Common Multiple
- Simplify
- Simplest Form
- Mixed Number
- Whole Number

### Add Fractions

$$\frac{4}{5} + \frac{2}{3}$$

1. Find a common multiple of 5 and 3

e.g.

$$\begin{array}{c} \text{x3} \left( \frac{4}{5} + \frac{2}{3} \right) \text{x5} \\ \frac{12}{15} + \frac{10}{15} \end{array}$$

Whatever you do to the top you must do to the bottom

3.

$$\begin{array}{c} \text{x3} \left( \frac{4}{5} + \frac{2}{3} \right) \text{x5} \\ \text{x3} \left( \frac{12}{15} + \frac{10}{15} \right) \text{x5} \\ = \frac{22}{15} \end{array}$$

### Divide fractions

$$\frac{4}{7} \div \frac{2}{5}$$

Stay Change Flip

$$\frac{4}{7} \times \frac{5}{2} = \frac{20}{14} = 1\frac{6}{14} = 1\frac{3}{7}$$

### Multiply Fractions

$$\frac{5}{8} \times \frac{3}{5}$$

Times the top AND times the bottom

$$\frac{5 \times 3}{8 \times 5} = \frac{15}{40}$$

Fractions  
Y6

$$\frac{5}{7}$$

← Numerator  
← Denominator



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

$$\frac{2}{5} \text{ Of } 15$$

Divide by the bottom

Times by the top

$$15 \div 5 = 3$$

$$3 \times 2 = 6$$

$$\frac{2}{5} \text{ Of } 15 = 6$$

Mixed number → Improper Fractions

2  $\frac{3}{5}$  1. Multiply whole number by the denominator

$$2 \times 5 = 10$$

2. Add the number to the answer

$$10 + 3 = 13 = \frac{13}{5}$$

Lowest common multiples

$$8 = 8, 16, 24$$

$$12 = 12, 24$$

$$\frac{3}{8} + \frac{5}{12}$$

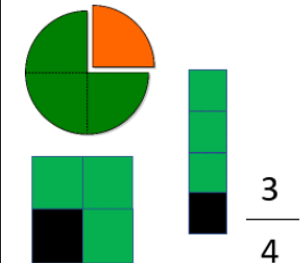
$$\text{x3} \left( \frac{9}{24} + \frac{10}{24} \right) \text{x2} = \frac{19}{24}$$

Common denominator = find another number that the bottom number (denominator) multiplies into.

e.g.

$$\frac{3}{6} = \frac{6}{12}$$

$$\frac{4}{5} = \frac{16}{20}$$



Multiply fraction by whole number

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

Improper fractions → mixed fractions

$$\frac{17}{3}$$

1. How many 3s in 17?

$$5 \text{ (} 3 \times 5 = 15 \text{)}$$

$$5 \frac{17-15}{3}$$

Subtract 15 from 17

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

Divide fraction by whole number

$$\frac{5}{7} \div 3$$

Turn whole number into fraction so  $3 = \frac{3}{1}$

$$\frac{5}{7} \div \frac{3}{1}$$

Stay Change Flip

$$\frac{5}{7} \times \frac{1}{3} = \frac{5}{21}$$

### Subtract fractions

Lowest common multiple

$$8 = 8, 16, 24, 32, 40$$

$$5 = 5, 10, 15, 20, 25, 30, 35, 40$$

$$\frac{7}{8} - \frac{3}{5}$$

$$\text{x5} \left( \frac{35}{40} - \frac{24}{40} \right) \text{x8} = \frac{11}{40}$$

[Click here to return to selection page](#)

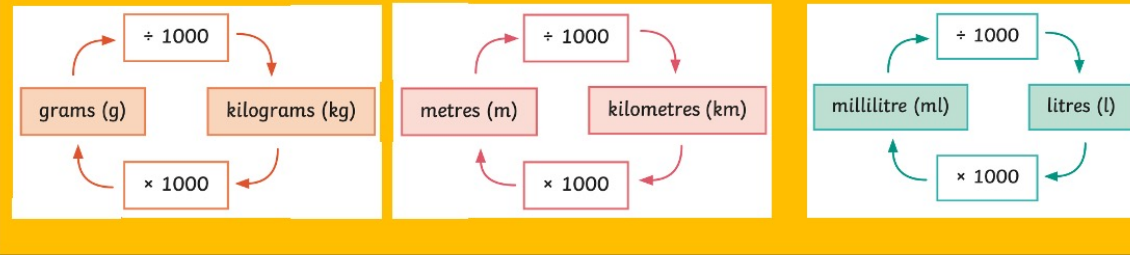


## Vocabulary

- Measure
- Compare
- Add
- Subtract
- Mass
- Volume
- Millilitres (ml)
- Litres (l)
- Kilograms (kg)
- Grams (g)
- Metres (m)
- Centimetres (cm)
- Millimetres (mm)
- Perimeter
- Time
- Analogue
- Digital
- Hours
- Minutes
- Seconds
- O'clock
- Half past
- Quarter past/to
- Midday
- Am and pm

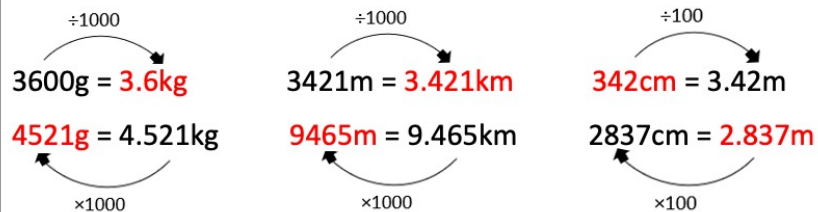
## Conversion

### The 1000 club!!!



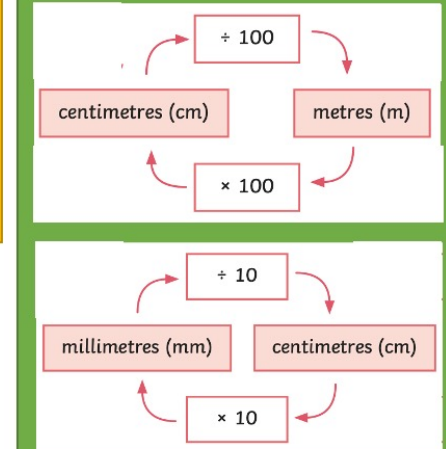
### Kilo = 1000

Children learn what the 1000 club is which means you always multiply or divide by 1000.

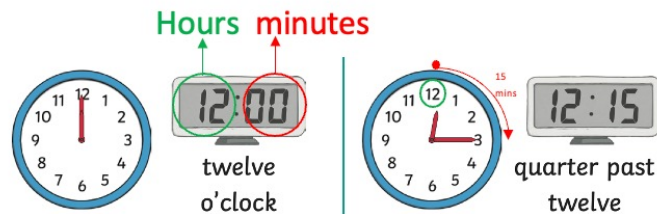


Conversion and  
time  
Y5/6

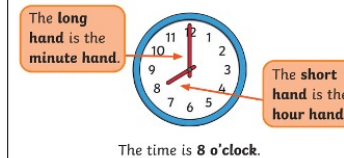
### The sad club ☹️



## Digital and analogue

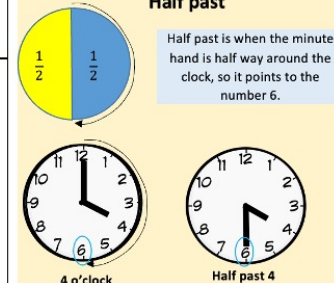


## Telling the time - o'clock



The time is 8 o'clock.

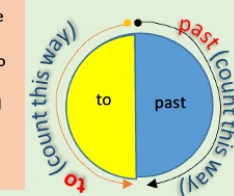
### Half past



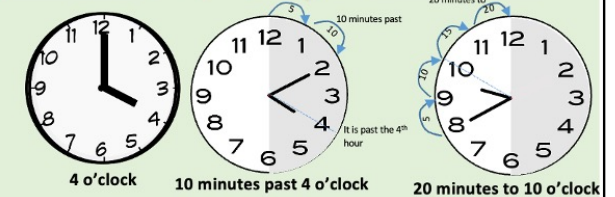
Half past is when the minute hand is half way around the clock, so it points to the number 6.

## Past and to (5 minute intervals)

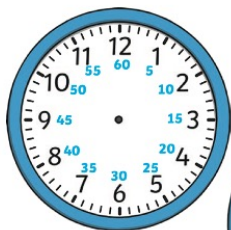
When the minute hour is on this side, you count to see how many minutes it is until the next hour (count this way from 12)



When the minute hour is on this side, you count to see how many minutes it is past the last hour (count in 5s this way from 12)

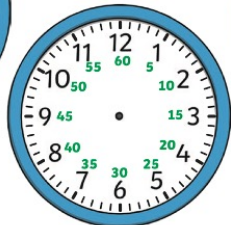


## How we measure time?



There are **60 seconds** in a minute.

There are **60 minutes** in an hour.



There are **24 hours** in a day

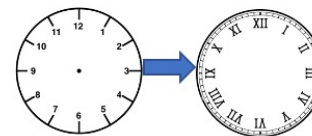
There are **7 days** in a week.



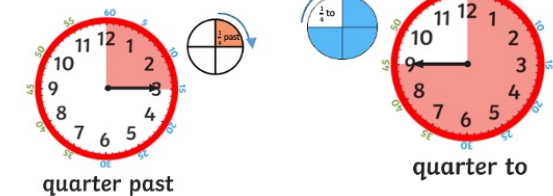
There are **12 months** in a year.



## Roman numerals



## Quarter past and to



[Click here to return to selection page](#)



## Vocabulary

- Algebra
- Sequences
- Expressions
- Equations
- Formulae
- Unknowns
- Bar models

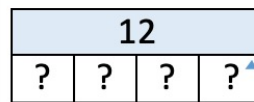
## What is algebra?

Believe it or not, algebra is used as early as Reception in school. Algebra is when something other than a number is used in maths to represent a value (an unknown).

E.g.  $2 + \underline{\quad} = 4$     $\bullet + \underline{\quad} = \bullet\bullet$

Missing numbers are algebra

$12 = \underline{\quad} \times 4$

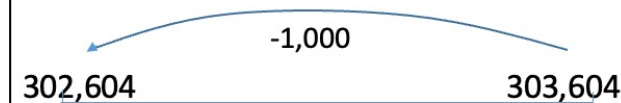


Question marks are also algebra as they are used instead of numbers and are unknown.

## Algebra as number sequences

303,604 302,604 301,604 300,604 ...

The symbol '...' is the unknown in this question. In order to find the unknown, you need to find the difference between the numbers in the sequence. Try it with two numbers.



Therefore,  $300,604 - 1,000 = \dots$

$$\begin{array}{r} 300\ 604 \\ - 1\ 000 \\ \hline 299\ 604 \end{array}$$

See addition and subtraction knowledge organiser for column subtraction

## Algebra notation

Any letter or symbol can be used to represent a number.

### Adding

$a + 14$  means you are adding 14 to  $a$ .  
(e.g. if  $a=12$ , then  $12+14=26$ )

### Subtracting

$a - 10$  means you are subtracting 10 from  $a$ .  
(e.g. if  $a=20$ , then  $20-10=10$ )

### Multiplying

$4a$  means 4 times the value of  $a$  (e.g. if  $a=2$ , then  $4 \times 2=8$ )

### Dividing

$a \div 5$  means how many 5s are in the value of  $a$ ?

(e.g. if  $a=15$ , then  $15 \div 5=3$ )

## More than one operation

You must use BODMAS (see addition and subtraction knowledge organiser).

$4a - 10$  means multiply  $a$  by 4 and then subtract 10 from this number.

(e.g. if  $a=4$ , then  $4 \times 4=16$ , then subtract  $10 = 6$ )

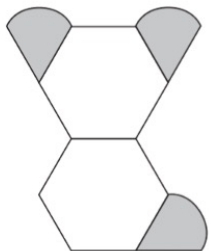
**Expressions** are a group of numbers and letters without the equals (=) sign. E.g.  $a + 10$  or  $b - c$

**Equations** are a group of numbers and letters with an equals (=) sign. E.g.  $a + 10 = 12$  or  $b - c = 1$

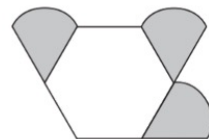
**Formulae** show how to calculate something, such as the area of a square (area = base x width)

## Multi-step problem (SATs Q)

She gives each shape a value.



Total value is 147

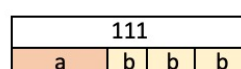
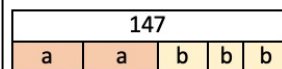


Total value is 111

What is the value of each shape?

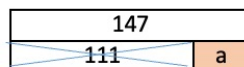
1. Label the shapes letters =  $a$    =  $b$

2. So the first shape is  $2a + 3b = 147$  and the second is  $a + 3b = 111$



Replace the letter  $a$  with 36

3. The only difference between the first and second shape is the first shape has one more 'a', so  $147 - 111 = a$  as subtracting finds the difference.



So,  $a=36$

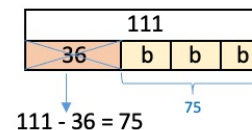
## Equations with a pair of unknowns

In an equation with two unknown numbers, there may be **several** possible values for the unknowns that will balance the equation.

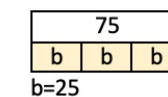
$ab = 18$		$2a + b = 10$	
$a$	$b$	$a$	$b$
1	18	2	6
2	9	3	4
3	6	4	2
6	3	5	0
9	2		
18	1		

Children should explore different combinations in these questions.

4. If we know  $a=36$ , then...



5. Finally,  $75 \div 3 = 25$



= 36   = 25

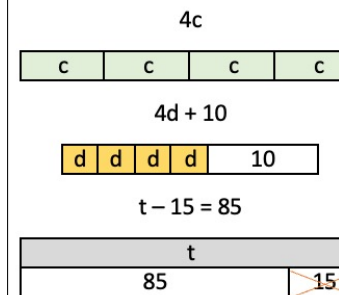
Being confident with bar models will immensely support a child's reasoning in these questions.

## Algebra

Y5/6



## Algebra as bar models



[Click here to return to selection page](#)

## Vocabulary

- Ratio
- Proportion
- Bar model
- Multiply
- Multiplication
- Lots of
- Times
- Division
- Grouping
- Sharing
- Arrays

### What is ratio?

Ratio compares the amounts of two or more things.

Example 1



The ratio of red to yellow is 2:8 as there are 2 red and 8 yellow.

Example 2



The ratio of blue to green to orange is 2:5:3.



### What is proportion?

Proportion uses the ratio to find different amounts of a total and/or simplifies a ratio.

E.g.



The ratio is 1 red square to every 5 yellow squares.

The ratio is 1:4

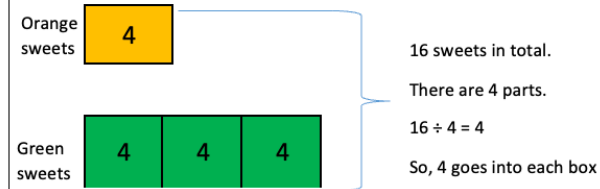
The original ratio was 2:8 (there are 2 red squares and 8 yellow squares).

$$\begin{array}{c} 2:8 \\ \div 2 \quad \div 2 \\ \hline 1:4 \\ 2:8 = 1:4 \end{array}$$

### Ratio and proportion word problems (using the bar model)

5. Jill has a bag of 16 sweets. She has 1 orange sweet for every 3 red sweets.
- What is the ratio of orange to red sweets? **1:3**
  - How many orange sweets are there?

Draw a bar model for each part of the ratio.



There are 4 orange sweets and 12 green sweets ( $4 \times 3 = 12$ ).

### Ratio and proportion word problems (abstract)

- Jill has a bag of 16 sweets. She has 1 orange sweet for every 3 red sweets.

- What is the ratio of orange to red sweets? **1:3**
- How many orange sweets are there?
- Write the ratio along with the total of the ratio (4 here)

Write the total number underneath

Orange: Red : Total

So, you must multiply all by 4

$$\begin{array}{c} 1 : 3 : 4 \\ \times 4 \quad \times 4 \quad \times 4 \\ \hline 4 : 12 : 16 \end{array}$$

x4 to get the total

- $1 \times 4 = 4$ , so there are 4 orange sweets.
- $3 \times 4 = 12$ , so there are 12 red sweets

### SATs Q

You can make green paint by mixing:

- 250 ml of blue paint
- 1,150 ml of yellow paint.

Stefan wants to make some of this green paint.

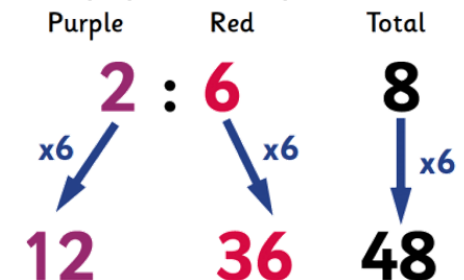
He uses 750 ml of **blue** paint.

How much **green** paint does he make?

	Blue	:	yellow	:	green (total)	
	250	:	1150	:	1400	
x3	750	:	3450	:	4200	x3

Answer: He made 4200ml of green paint.

### Ratio and proportion example



[Click here to return to selection page](#)

### Mean example

12	15
10	8
15	

$$12 + 15 + 10 + 8 + 15 = 60$$

$$60 \div 5 = 12$$

The mean of this data is 12.

### Vocabulary

- Bar chart
- Pictogram
- Frequency table
- Tally chart
- Pie chart
- Discrete data
- Continuous data
- Line graph
- Sum
- Difference
- Comparison
- Interpret
- Mean
- Average

### Statistics Y5/6



#### Tables and tally charts

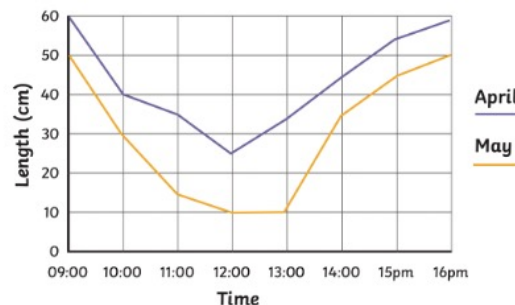
Method of Travel	Tally	Frequency
Walk		9
Bike		3
Car		6
Bus		12
TOTAL		30

### Line graph

Line graphs are used to show changes to a measurement over time.

It is used for continuous data (numbers that are not fixed).

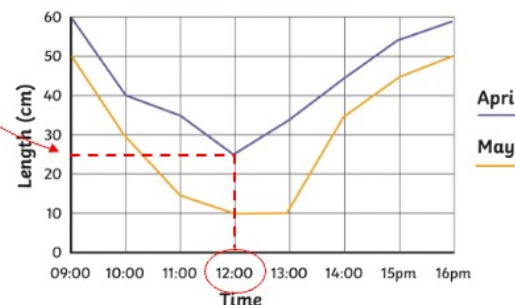
A line graph to show the length of shadows over time



To find values on a line graph, your child must use a ruler to draw lines to find the corresponding value.

For example, what time was the length of the shadow 25cm during April?

A line graph to show the length of shadows over time

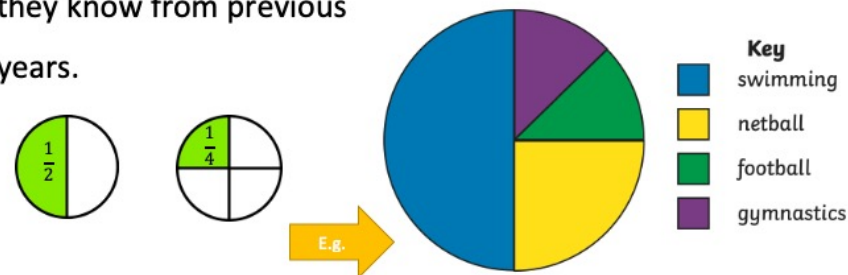


Mean is when you add up all the values and divide it by the total number of values.

### Pie charts

Children should use what they know from previous years.

A pie chart to show children's favourite sports

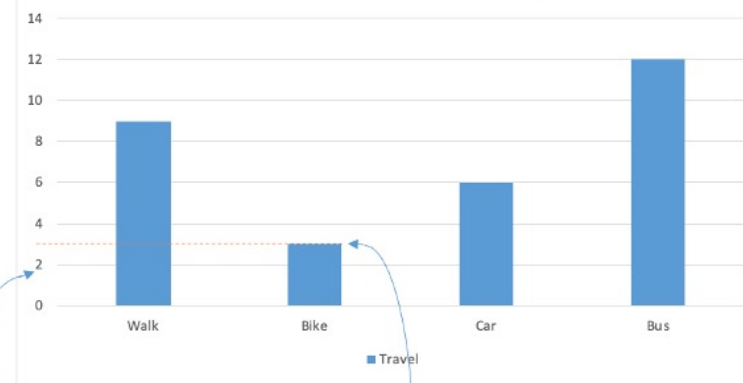


Use these fractions and the total to find out different values

24 children were asked in total.  
 Swimming =  $\frac{1}{2}$  so  $\frac{1}{2}$  of 24 = 12 children  
 Netball =  $\frac{1}{4}$  so  $\frac{1}{4}$  of 24 = 6 children  
 Football =  $\frac{1}{8}$  so  $\frac{1}{8}$  of 24 = 3 children  
 Gymnastics =  $\frac{1}{8}$  so  $\frac{1}{8}$  of 24 = 3 children

### Bar chart

Most popular forms of transport



Scale (counting in 2s)

- To interpret a bar chart, children must draw a line to check the value of a bar.
- To draw a bar chart, the children must decide on a suitable scale, make sure the bars are an equal distance apart and the same thickness.



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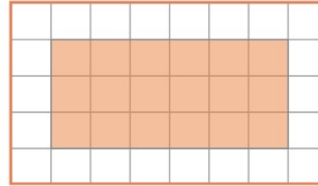


## Vocabulary

- Perimeter
- Area
- Volume
- Units
- Width
- Length
- Rectangle
- Formula
- Height
- Base
- Parallelogram

## Area of rectangles

length  $\times$  width = area of a rectangle



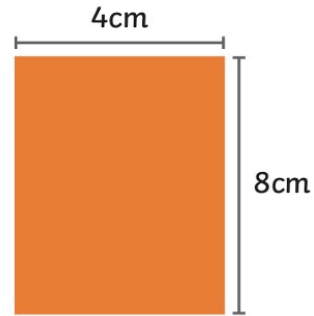
Counting squares:

$$\text{area} = 18\text{cm}^2$$

Use formula:

$$6\text{cm} \times 3\text{cm}$$

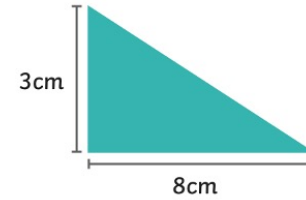
$$\text{area} = 18\text{cm}^2$$



$$8\text{cm} \times 4\text{cm} \text{ area} = 32\text{cm}^2$$

## Area of triangles

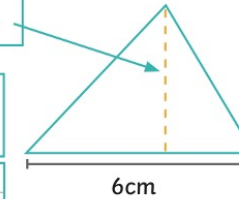
base  $\times$  perpendicular height  $\div 2$  = area of a triangle



$$8\text{cm} \times 3\text{cm} \div 2$$
$$\text{area} = 12\text{cm}^2$$

perpendicular height = 5cm

$$6\text{cm} \times 5\text{cm} \div 2$$
$$\text{area} = 15\text{cm}^2$$



Counting squares:

$$6 \text{ whole squares} = 6\text{cm}^2$$

$$6 \text{ half squares} = 3\text{cm}^2$$

$$6\text{cm}^2 + 3\text{cm}^2 = 9\text{cm}^2$$

$$\text{area} = 9\text{cm}^2$$

Using formula:

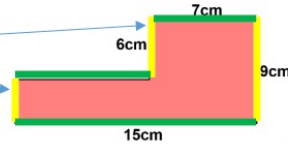
$$6\text{cm} \times 3\text{cm}$$

$$\div 2 = 9\text{cm}^2$$

## Missing lengths

Use 2 colours to show vertical and horizontal lines.

$$\_ + 6 = 9 \text{ and } 7 + \_ = 15$$

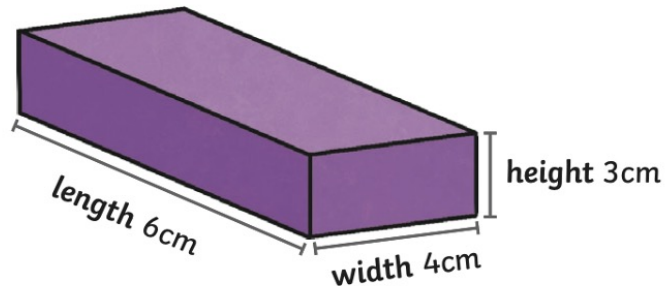


## Area, perimeter and volume Y5/6



## Volume of cuboids

length  $\times$  width  $\times$  height = volume of a cuboid



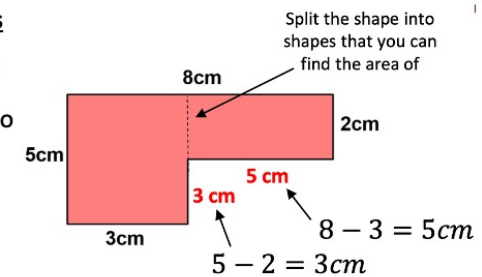
Multiply dimensions in **any** order:

$$3\text{cm} \times 6\text{cm} \times 4\text{cm}$$

$$\text{volume} = 72\text{cm}^3$$

## Compound shapes

Compound shapes are shapes that two shapes joined together.



$$\text{Area} = (5 \times 3) + (2 \times 5)$$
$$= 25\text{cm}^2$$

$$\text{Perimeter} = 3 + 5 + 8 + 2 + 5 + 3$$
$$= 26\text{cm}$$



[Click here to return to selection page](#)