

# Collective Vision Trust

## Maths Curriculum

Year by Year Crucial Knowledge



### Key to the Colour Code

*Each maths component has been given its own colour so that you can easily spot which component you are doing.*

<b><u>Number: Place value</u></b>	This is the most important part of maths – all other topics will use the knowledge that you learn here.
<b><u>Number: Addition and subtraction</u></b>	These two topics build upon your knowledge of place value.
<b><u>Number: Multiplication and division</u></b>	
<b><u>Number: Fractions</u></b>	These topics build upon your place value knowledge and will use and develop your addition, subtraction, multiplication and division skills.
<b><u>Number – Decimals</u></b>	
<b><u>Number – Percentages</u></b>	
<b><u>Number – Ratio</u></b>	
<b><u>Number – Algebra</u></b>	This is the final skill in ‘number’ that you will learn about. You will need all the other crucial knowledge in order to learn this.
<b><u>Measurement</u></b>	In this part of maths we apply our number knowledge to all the different things we ‘measure’
<b><u>Geometry - Shape</u></b>	These topics are all to do with shapes – you will still need your number knowledge though.
<b><u>Geometry – Position and Direction</u></b>	
<b><u>Statistics</u></b>	This is the final part of maths. It looks at how we use maths to show information. Your number skills are still needed for this.

## Maths EYFS Crucial Knowledge

**Number:** an amount

- A number is an amount of something.
- It can be shown in words, digits, symbols or pictures to show that amount.  
*six 6 VI .....*
- We use numbers to count an amount.

**+ addition:** put together

- Adding is bringing two or more things together – they will make a new amount.
- Addition can be used to count (adding one or more each time).
- When adding the answer will always be greater than the parts being added

**- subtraction:** taking away

- Subtraction is taking away from an amount.
- The answer is always smaller than the original amount.
- Subtraction can be used to count backwards.
- Subtraction shows the difference between two values eg.  $10 - 4 = 6$  therefore the difference between 10 and 4 is 6.

**Total:** the final amount or answer

**Number bonds:** are two numbers that make a set amount  
(  $7 + 3 = 10$ ,  $9 + 1 = 10$ ,  $4 + 6 = 10$  )

- Number bonds are used in addition and subtraction

**Double**

is adding the same amount again

(double 2 is  $2 + 2$ )

## Maths Year 1 Crucial Knowledge

<p><b>Number:</b> an amount</p> <ul style="list-style-type: none"> <li>A number is an amount of something.</li> <li>It can be shown in words, digits, symbols or pictures to show that amount. <i>six 6 VI .....</i></li> <li>We use numbers to count an amount.</li> <li><b>odd</b> numbers are amounts which <b>cannot</b> be split equally (in whole numbers) between two</li> <li><b>even</b> numbers are amounts which <b>can</b> be split equally between two</li> <li>A number must be a whole number to be odd or even.</li> <li>The ones (unit) digit show whether a number is odd or even.</li> </ul>	<p><b>Digit:</b> a numeral 0 to 9</p> <ul style="list-style-type: none"> <li>There are ten digits that we use.</li> <li>A digit is any one of these symbols: 0 1 2 3 4 5 6 7 8 9</li> <li>The number 23 is written with two digits; 2 and 3.</li> <li>Digits can be used to identify (show) something – like a telephone number or house number.</li> </ul>	<p><b>Place value:</b> placement of digit</p> <ul style="list-style-type: none"> <li>Each digit holds a value.</li> <li>The value of a digit depends on where it is within a number.</li> <li>For example: 3 is ●●●</li> <li>In 37 the three has a value of 30</li> <li>In 307 the three has a value of 300</li> </ul> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e0e0e0;"> <th style="padding: 5px;">Millions</th> <th style="padding: 5px;">Hundred Thousands</th> <th style="padding: 5px;">Ten Thousands</th> <th style="padding: 5px;">Thousands</th> <th style="padding: 5px;">Hundreds</th> <th style="padding: 5px;">Tens</th> <th style="padding: 5px;">Ones</th> </tr> </thead> <tbody> <tr> <td style="height: 40px;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones							
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<p><b>+ addition:</b> put together</p> <ul style="list-style-type: none"> <li>Adding is bringing two or more things together – they will make a new amount.</li> <li>Addition can be used to count (adding one or more each time).</li> <li>When adding the answer will always be greater than the parts being added</li> </ul>	<p><b>- subtraction:</b> taking away</p> <ul style="list-style-type: none"> <li>Subtraction is taking away from an amount.</li> <li>The answer is always smaller than the original amount.</li> <li>Subtraction can be used to count backwards.</li> <li>Subtraction shows the difference between two values eg. <math>10 - 4 = 6</math> therefore the difference between 10 and 4 is 6.</li> </ul>	<p><b>Total:</b> the final amount or answer</p> <ul style="list-style-type: none"> <li>Can relate to all calculations</li> </ul>	<p><b>Number bonds:</b> two numbers that make a set amount ( <math>7 + 3 = 10</math>, <math>9 + 1 = 10</math>, <math>4 + 6 = 10</math> )</p> <ul style="list-style-type: none"> <li>Number bonds are used in addition and subtraction</li> </ul>
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<p><b>=</b> (often called equals)</p> <p>This symbol means 'same as'.</p> <p>It is usually used to show an answer.</p>	<p><b>&gt;</b> greater than</p> <p>The larger amount is placed by the larger opening and the smaller amount by the tip where the lines meet.</p>	<p><b>&lt;</b> less than</p> <p>The smaller amount is placed where the lines meet and the larger amount by the larger opening where the lines are furthest apart.</p>
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<p><b>X multiplication:</b> groups of</p> <ul style="list-style-type: none"> <li>• Multiplication is sometimes called multiplying.</li> <li>• It is 'groups of', the same as repeated addition.</li> <li>• <math>5 \times 3</math> or <math>5 + 5 + 5</math></li> </ul>	<p><b>÷ division:</b> splitting into parts</p> <ul style="list-style-type: none"> <li>• Splitting in to equal parts is also 'fair sharing'.</li> <li>• For example:</li> <li>• 12 treats between 3 dogs is</li> <li>• <math>12 \div 3 = 4</math></li> </ul>  <ul style="list-style-type: none"> <li>• </li> <li>• They have 4 treats each.</li> <li>• Sometimes there may be an amount that is 'left over' this is called a 'remainder'</li> </ul>	<p><b>Multiplication tables:</b> multiplication facts for a given number</p> <ul style="list-style-type: none"> <li>• Multiplication tables start with <math>1 \times</math> the number and finish with <math>12 \times</math> the number</li> <li>• Multiplication tables can be used to answer both multiplication and division questions</li> </ul>	<p><b>Double</b> is adding the same amount again</p> <p>(double 2 is <math>2 + 2</math>)</p>	<p><b>Half</b> is sharing equally by 2</p> <p>(half of 6 is 6 shared by 2)</p>
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**Fraction:** part of a whole (  $\frac{1}{2}$  ,  $\frac{3}{4}$  )

- The bottom number (denominator) is the total number of parts.
- The top number (numerator) is how many parts being used (looked at).
- Some fractions can be the same (equivalent) to other fractions. E.g.  $\frac{2}{4} = \frac{1}{2}$

**Measure:** the size of something

- To find out the size or amount of something.
- We can measure: distance, area, time, mass and volume.
- Distance is the space between points in a straight line
- We often use a ruler to measure a length or height

**Length** is long

**Width** is wide

**Height** is tall

**Weight, volume and capacity**

- Weight is often used to describe the mass of an object – how heavy something is
- Volume is the amount of space within something.
- Capacity is how much something holds
- Capacity is usually a measure of liquid or gas

**Money**

- Money tells us how much something costs
- We use pounds (£) and pence (p)
- 100p is the same amount of money as £1

**Time**

- Time is how long something takes.

### Geometry – Shape

- Shape is an outline or form of an object.
- Dimension is a measurement
- 2D (two dimensions) is a shape that has two measurements (e.g. width and height). It can't be picked up.
  
- 3D (three dimensions) is a shape that has three measurements (width, height, depth). It can be picked up.

### Geometry – Position and direction

- Position is where something is.
- Direction tells you how to get to a position

## Maths Year 2 Crucial Knowledge

*You need to recap all of your year 1 crucial knowledge as well as adding the following....*

### **Column addition and subtraction:**

Numbers are written in place value columns underneath one another

- Start adding or subtracting the column on the right and work across to the left
- When adding, this can be done in any order (ie smallest or largest first)
- For subtraction the number you are taking away must go underneath the number you are starting

### **Measurement – Mass, capacity and temperature**

- Mass is how heavy an object is
- It is similar to weight
- Capacity is how much something holds
- Capacity is usually a measure of liquid or gas
- Temperature is how hot or cold something is

### **Symmetry**

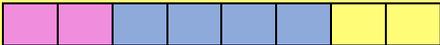
is when a shape is exactly like another shape when it is moved:  
rotated (turned) or flipped

Some shapes have **names**

**Properties** are things that all shapes with the same name have  
in common

## Maths Year 3 Crucial Knowledge

***You need to recap all of your year 1 and 2 crucial knowledge as well as adding the following...***

<p>An <b>estimate</b> means to find a value close/near to the actual by making an observation or using some information we already know</p>	<p style="text-align: center;"><b>Adding fractions:</b></p> <ul style="list-style-type: none"> <li>Only add the top number (numerator).</li> <li><i>If the bottom number is the same, it stays the same.</i></li> </ul> $\frac{2}{8} + \frac{4}{8} = \frac{6}{8}$ <div style="text-align: center;">  </div> <ul style="list-style-type: none"> <li>If the bottom number isn't the same, find a new number that relates to both denominators.</li> </ul> $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$	<p style="text-align: center;"><b>Subtracting fractions:</b></p> <ul style="list-style-type: none"> <li>Only subtract the top number (numerator).</li> <li><i>If the bottom number is the same, it stays the same.</i></li> </ul> $\frac{4}{8} - \frac{2}{8} = \frac{2}{8}$ <ul style="list-style-type: none"> <li>If the bottom number isn't the same, find a new number that relates to both denominators.</li> </ul> $\frac{1}{3} - \frac{1}{4} = \frac{4}{12} - \frac{3}{12} = \frac{1}{12}$
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<p style="text-align: center;"><b>Measurement – Length and perimeter</b></p> <ul style="list-style-type: none"> <li><b>Perimeter</b> is the length all the way around the edge of a shape</li> <li>You can find a perimeter by adding the lengths of all of the sides of the shape together</li> </ul>	<p style="text-align: center;">An <b>angle</b> is a space where two lines meet</p>
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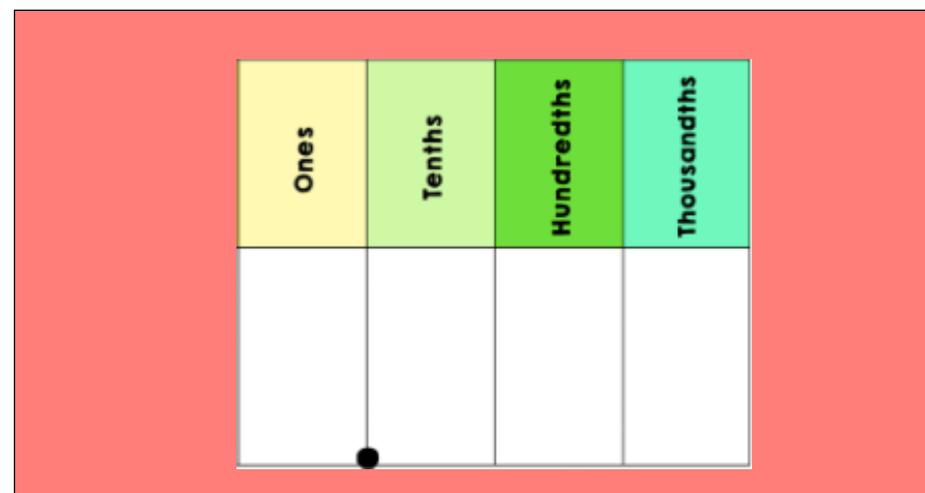
## Maths Year 4 Crucial Knowledge

*You need to recap all of your year 1, 2 and 3 crucial knowledge as well as adding the following....*

<p><b>Rounding:</b></p> <ul style="list-style-type: none"> <li>• When the digit on the place value in question is 5 or above - round up</li> <li>• When the digit on the place value in question is 4 or below – round down</li> </ul>	<p><b>Negative numbers:</b></p> <ul style="list-style-type: none"> <li>• A real number that is less than zero.</li> <li>• Often used to show a cold temperature</li> <li>• Negative numbers are shown with a negative sign before the number. Eg. -5</li> </ul>	<p><b>Partition:</b></p> <p>means to split into smaller parts</p>	<p><b>Factors</b> are numbers that divide into another number equally without anything left over.</p> <ul style="list-style-type: none"> <li>• They usually come in pairs ( 1 and 12, 2 and 6, 3 and 4 are all factors of 12)</li> </ul>	<p><b>Multiples</b> are the result after multiplying</p> <ul style="list-style-type: none"> <li>• 12 is a multiple of 2 as <math>6 \times 2 = 12</math></li> </ul>
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**Decimals:** smaller than one

- A decimal is a value smaller than one
- A decimal is shown to the right of a decimal point
- A decimal point is a dot showing that a value smaller than one is to follow
- For example: 0.42 shows four tenths and two hundredths
- Tenths are ten parts of one whole.
- Hundredths are one hundred parts of one whole.
- A decimal point **never** moves.



## Measurement – Area

- **Area** is measurement of a flat space.
- Area is the number of **squares** inside a shape

## Statistics is looking at data

- **Data** is information.
- **Statistics** is collecting and showing information (data) so that we can talk about it.
- A **table** is list to record the information collected.
- A table has rows (go across) and columns (go down)
- A **graph** is a picture to show the information (data).

## Maths Year 5 Crucial Knowledge

*You need to recap all of your year 1, 2, 3 and 4 crucial knowledge as well as adding the following....*

### **Prime Numbers:**

- only have two factors - itself and 1
- 1 is not a prime number

**Square numbers** are when a number is multiplied by itself to make a square

- One row and one column would make one square (or  $1 \times 1 = 1$ , so 1 is a square number)
- Two rows and two columns would make four squares (or  $2 \times 2 = 4$ , so 4 is a square number)
- Three rows and three columns would make 9 squares (or  $3 \times 3 = 9$ , so 9 is a square number)

**Cube numbers** are when a number is multiplied by itself three times to make a cube.

- length x height x width eg  $3 \times 3 \times 3 = 27$ , so 27 is a cube number

**Brackets** show that things go together

**Calculate:** solving

- We can use  $+$   $-$   $\times$   $\div$  to calculate (solve) maths questions and problems.

**Method** is a way of doing something

**Reasoning:** to make sense

- Reasoning is making sense of maths by using maths skills and knowledge.
- Think about the information given and the maths skills you already know to find an answer (solution).
- E.g.
  - If two pens cost 20p, one pen must cost 10p
  - *I know there are two pens and the total cost is 20p.*
  - *If I separate the pens into singles, I have two groups of pens with one pen in each group.*
  - *If I separate the money in the same way – I separate the 20p into two groups, I will have two 10ps, so each pen costs 10p.*

### Multiplying fractions:

- Multiply the top number (numerator) **and** the bottom number (denominator)
- If the bottom number isn't the same, find a new number that relates to both denominators.

$$\frac{2}{3} \times \frac{1}{4} = \frac{2 \times 1}{3 \times 4} = \frac{2}{12}$$

### Percentage:    part of a 100

- Per cent means out of 100
- % this symbol means percent
- 40% means 40 out of 100
- 11% means 11 out of 100

A **compound shape** is two or more shapes put together to make one shape.

### Measurement – Converting units

- Converting units means changing from one unit to another
- You need to know the facts of how units are related to one another

### Measurement – Volume

- Volume is the amount of space within something
- Volume is the number of cubes inside something

**Regular** means all the same.

A regular shape means all sides are the same

**Irregular** means not the same.

An irregular shape means all sides are not the same

**Reflection** is when a shape flips to a mirror image

It is identical in form but reversed like in a mirror

**Translation** moves a shape. It can move up, down or to the side

It never changes its form or shape in any way

Grid **co-ordinates** are a way to find a position.

They must always be given in the following order:

The x axis (row) is always shown first, followed by the y axis (column)

## Maths Year 6 Crucial Knowledge

*You need to recap all of your year 1, 2, 3, 4 and 5 crucial knowledge as well as adding the following....*

### Dividing fractions:

- **Keep** the first fraction, **change** the divide to a multiply, **flip** the second fraction
- For example

$$\frac{2}{3} \div \frac{1}{4} = \frac{2}{3} \times \frac{4}{1} = \frac{8}{3}$$

### Ratio: compare values

- Ratio compares values (numbers) in a set order.
- Example:
- The ratio of dogs to cats is.



3:1

or

The ratio of cats to dogs is.



1:3

- ∴ this symbol is used to separate the values in a ratio

### Algebra: showing a number

- Using a letter or symbol to show a number  
 $y + 3 = 10$   
 so here  $y = 7$
- To solve algebra inverse (opposite) instructions are used
- Inverse means the opposite
  - Inverse of + is –
  - Inverse of – is +
  - Inverse of  $\times$  is  $\div$
  - Inverse of  $\div$  is  $\times$