Collective Vision Trust

Maths Curriculum
Year by Year Crucial Knowledge

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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.

Number: Place value	**This is the most important part of maths – all other topics will use the knowledge that you learn here.**
Number: Addition and subtraction	**These two topics build upon your knowledge of place value.**
Number: Multiplication and division	
Number: Fractions	**These topics build upon your place value knowledge and will use and develop your addition, subtraction, multiplication and division skills.**
Number – Decimals	
Number – Percentages	
Number – Ratio	
Number – Algebra	**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.**
Measurement	**In this part of maths we apply our number knowledge to all the different things we 'measure'**
Geometry - Shape	**These topics are all to do with shapes – you will still need your number knowledge though.**
Geometry – Position and Direction	
Statistics	**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.**

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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	**- subtraction:** taking apart	**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)
• 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 is taking apart or taking something away. • Subtraction can be used to count backwards (taking away one or more away each time). • The outcome of subtraction is the difference between two amounts (or numbers).		• 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

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.

Digit: a numeral 0 to 9

- There are ten digits that we use.
- A digit is any one of these symbols: 0 1 2 3 4 5 6 7 8 9
- The number 23 is written with two digits; 2 and 3.
- Digits can be used to identify (show) something – like a telephone number or house number.

Place value: placement of digit

- Each digit holds a value.
- The value of a digit depends on where it is within a number.
- For example: 3 is ●●●
- In 37 the three has a value of 30
- In 307 the three has a value of 300

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

+ 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 apart

- Subtraction is taking apart or taking something away.
- Subtraction can be used to count backwards (taking away one or more away each time).
- The outcome of subtraction is the difference between two amounts (or numbers).

Total: the final amount or answer

- Can relate to all calculations

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

- Number bonds are used in addition and subtraction

= (often called equals)	> greater than	< less than
This symbol means 'same as'.	The larger amount is placed by the larger opening and the smaller amount by the tip where the lines meet.	The smaller amount is placed where the lines meet and the larger amount by the larger opening where the lines are furthest apart.
It is usually used to show an answer.		

X multiplication: groups of	÷ division: splitting into parts	Multiplication tables: multiplication facts for a given number	Double is adding the same amount again	Half is sharing equally by 2
• Multiplication is sometimes called multiplying. • It is 'groups of', the same as repeated addition. • 5 x 3 is • or 5 + 5 + 5	• Splitting in to equal parts is also 'fair sharing'. • For example: • 12 treats between 3 dogs is • 12 ÷ 3 = 4 • 🦴🦴🦴🦴 🦴🦴🦴🦴 🦴🦴🦴🦴 • They have 4 treats each. • Sometimes there may be an amount that is 'left over' this is called a 'remainder'	• Multiplication tables start with 1x the number and finish with 12 x the number • Multiplication tables can be used to answer both multiplication and division questions	(double 2 is 2 + 2)	(half of 6 is 6 shared by 2)
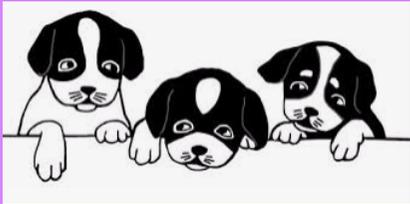
Fraction: part of a whole (½ , ¾)

- 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. 2/4 = 1/2

Measure: the size of something	**Weight and volume**	**Money**	**Time**
- 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 is often used to describe the mass of an object – how heavy something is - Volume is the amount of space within something.	- Money tells us how much something costs - We use pounds (£) and pence (p) - 100p is the same anount of money as £1	- 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….

An **estimate** means to find a value close/near to the actual by making an observation or using some information we already know

Adding fractions:

- Only add the top number (numerator).
- *If the bottom number is the same, it stays the same.*
$$\frac{2}{8} + \frac{4}{8} = \frac{6}{8}$$
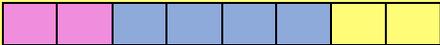
- If the bottom number isn't the same, find a new number that relates to both denominators.
$$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$$

Subtracting fractions:

- Only subtract the top number (numerator).
- *If the bottom number is the same, it stays the same.*
$$\frac{4}{8} - \frac{2}{8} = \frac{2}{8}$$

- If the bottom number isn't the same, find a new number that relates to both denominators.
$$\frac{1}{3} - \frac{1}{4} = \frac{4}{12} - \frac{3}{12} = \frac{1}{12}$$

Measurement – Length and perimeter

- **Perimeter** is the length all the way around the edge of a shape
- You can find a perimeter by adding the lengths of all of the sides of the shape together

An **angle** is a space where two lines meet

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….

Rounding:	**Negative numbers:**	**Partition:**	**Factors** are numbers that divide into another number equally without anything left over.	**Multiples** are the result after multiplying
• When the digit on the place value in question is 5 or above - round up • When the digit on the place value in question is 4 or below – round down	• A real number that is less than zero. • Often used to show a cold temperature	means to split into smaller parts	• They usually come in pairs (1 and 12, 2 and 6, 3 and 4 are all factors of 12)	• 12 is a multiple of 2 as 6 x 2 = 12

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.

Ones	Tenths	Hundredths	Thousandths
•			
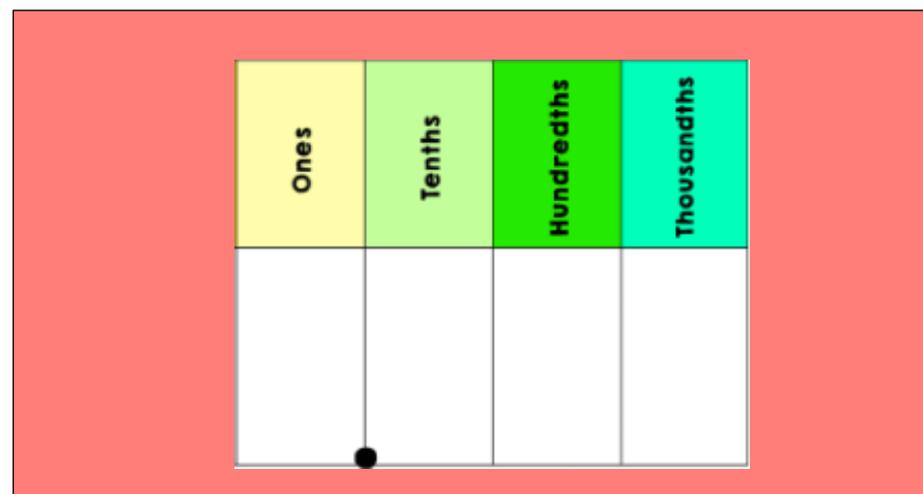
Measurement – Area

- **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:	Square numbers are when a number is multiplied by itself to make a square	Cube numbers are when a number is multiplied by itself three times to make a cube.
• only have two factors - itself and 1 • 1 is not a prime number	• One row and one column would make one square (or 1 x 1 = 1, so 1 is a square number) • Two rows and two columns would make four squares (or 2 x 2 = 4, so 4 is a square number) • Three rows and three columns would make 9 squares (or 3 x 3 = 9, so 9 is a square number)	• length x height x width eg 3 x 3 x 3 = 27, so 27 is a cube number

Brackets show that things go together	Calculate: solving	Method is a way of doing something
	• We can use + - x ÷ to calculate (solve) maths questions and problems.	

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 in to 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** 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 x is ÷
  - Inverse of ÷ is x