

Mastery Maths Vocabulary



Contents Page

	Page
Concrete	3
Pictorial	3
Abstract	4
Fluency	4
Reasoning	4
Problem Solving	5
Deeper understanding	5
Addition & Subtraction	6-7
Multiplication & Division	8-10
Fractions	11
Geometry	12

Mastery Maths Vocabulary

Concrete, Pictorial and Abstract

Objects, pictures, words, numbers and symbols are everywhere. The mastery approach incorporates all of these to help pupils explore and demonstrate mathematical ideas, enrich their learning experience and deepen understanding. Together, these elements help cement knowledge so pupils truly understand what they've learnt.

Pupils are encouraged to physically represent mathematical concepts with resources. Pictures are used to visualise key mathematical concepts and the abstract stage is where children use and apply their mathematical skills to solve problems.

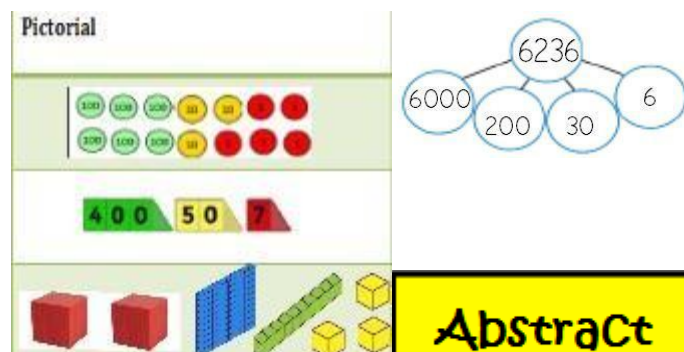
Concrete

Using concrete objects, equipment and manipulatives to help children understand and explain what they are doing.



Pictorial

Pictorial representations are pictures, diagrams or drawings that are used to help children reason and solve problems.



Abstract

Using numbers and concepts with confidence.

key

Complete the missing value

$$2a) 9384 = 9000 + 300 + ? + 4$$

$$2b) ? = 8000 + 0 + 0 + 8$$

$$2c) 7996 = 7000 + ? + ? + 6$$

$$2d) 9918 = ? + ? + 10 + 8$$

Fluency, Reasoning and Problem Solving

Fluency

Pupils should be able to recall and apply mathematical knowledge both rapidly and accurately. As well as fluency of facts and mental strategies pupils should be able to move confidently between contexts and representations, recognise relationships and make connections in mathematics.

What numbers are represented below?



Write them in numerals and words.

Reasoning

Pupils should explain and solve a variety of maths problems. They should be able to say not just what the answer is, but how they know it's right.

Looking at the statements below, decide which statement is Always, sometimes or Never and explain your reasoning.

- When counting in hundreds the ones digit changes.
- The thousands column changes every time you count in thousands.
- To count in thousands, we use 4 digit numbers.

Problem Solving

Pupils are encouraged to identify, understand and apply relevant mathematical principles and make connections between different ideas. Mathematical concepts are explored in a variety of representations and problem-solving contexts to give pupils a richer and deeper learning experience. Pupils combine different concepts to solve complex problems, and apply knowledge to real-life situations.

Two different two-digit numbers both round to 40 when rounded to the nearest 10

The sum of the 2 numbers is 79

What could the two numbers be?

Is there more than one possibility?

Deeper understanding

Pupils must be given tasks that give them an opportunity to investigate, explore and apply ideas. This approach enables children to use their skills to solve challenging mathematical problems.

Deeper understanding

Claire thinks of a 4 digit number. The digits add up to 12. The difference between the first and fourth digit is 5. What could Claire's number be?

Use the clues to find the missing digits.

□□□□

The thousands and tens digit multiply together to make 24.

The hundreds and tens digit have a digit total of 9.

The ones digit is double the thousands digit. The whole number has a digit total of 18.

Addition & Subtraction

Addend

A number which is added to another. All numbers in an addition calculation are called an 'Addend'.

$$\begin{array}{c} 8 + 6 = 14 \\ \uparrow \quad \uparrow \\ \text{addends} \end{array}$$

Sum

The answer in an addition calculation is called 'Sum' or 'Total'

Total

$$\begin{array}{c} 2 + 3 = 5 \\ \uparrow \quad \uparrow \quad \uparrow \\ \text{Addend} \quad \text{Addend} \quad \text{Sum or Total} \end{array}$$

Minuend

The first number in a subtraction. The number from which another number (the Subtrahend) is to be subtracted.

$9 - 3 = 6$
minuend

Subtrahend

The number that is to be subtracted. It is the number(s) after the minuend.

$$9 - 3 = 6$$

subtrahend

Difference

The answer in a subtraction calculation is called the 'difference'. The result of subtracting one number from another.

$8 - 3 = 5$
Minuend Subtrahend Difference

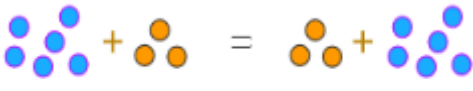
Distributive law

Manipulating numbers to make a calculation easier to solve.

The diagram illustrates the decomposition of the addition problem $38 + 26 = 64$. A curved arrow labeled '2' indicates that 2 is taken from 26 and added to 38 to make 40. Below this, two vertical arrows point down from the original numbers to the decomposed numbers: 38 becomes 40 and 26 becomes 24. The final equation shown is $40 + 24 = 64$.

Commutative law

Is the Law that says you can swap numbers around and still get the same answer when you add.



$$6 + 3 = 3 + 6$$

Associative Law

The "Associative Law" say that it doesn't matter how we group the numbers (i.e. which we

Multiplication & Division

Multiplicand

A Multiplicand is the sentence.



$$(6+3)+4 = 6+(3+4)$$

calculate first) when



$$41 \times 23$$

Multiplicand

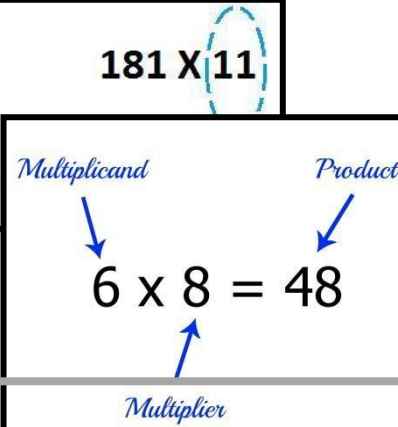
we add.

first number in a multiplication

Multiplier

A multiplier is the number(s) after the multiplicand.

Product



$$181 \times 11$$

Multiplicand → $6 \times 8 = 48$ → *Product*

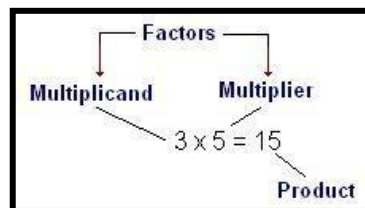
Multiplier →

The answer to a

multiplication calculation.

Factor

The alternative name for the multiplicand and multiplier because the commutative law applies.



Dividend

A

dividend is the first number in a division

sentence

A diagram showing the word "Dividend" in blue. An arrow points down from it to the number 40 in the equation $40 \div 8 = 5$. The number 40 is also in blue, while 8 is green and 5 is orange.

Divisor

A divisor is the second number(s) in sentence

A diagram showing the equation $40 \div 8 = 5$. The number 8 is green. An arrow points from the word "Divisor" in green to the number 8. The number 40 is blue and the number 5 is orange.

a division

Quotient

A quotient is the answer in a division sentence

$$40 \div 8 = 5$$

Quotient

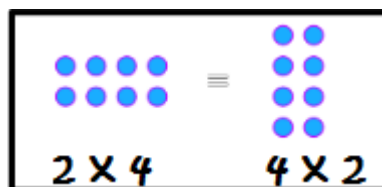
Distributive law

States that we can partition a number before applying the operation without affecting the answer. We can use this law whenever we attempt a multi-digit multiplication because the methods we use rely upon this law.

For example, to calculate 7×36 we can calculate 7×30 and 7×6 and add them together. The 36 has been partitioned into $30 + 6$ before the multiplication by 7.

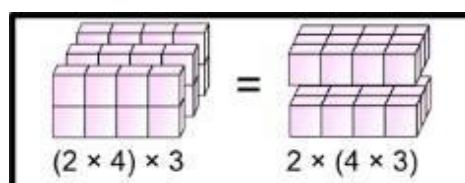
Commutative law

Is the Law that says you can swap numbers around and still get the same answer when you multiply.



Associative Law

The "Associative Law" say that it doesn't matter how we group the numbers (i.e. which we calculate first) when we multiply.



Fractions

Numerator

The top number of a fraction.

$$\frac{1}{2}$$

← The Numerator

Denominator

The bottom number of a fraction.

DENOMINATOR:

The bottom
part of a
fraction →

$$\frac{1}{3}$$

Vinculum

The line that separates the numerator from the denominator and signifies division.

$$\frac{\square}{\square}$$

→ Numerator

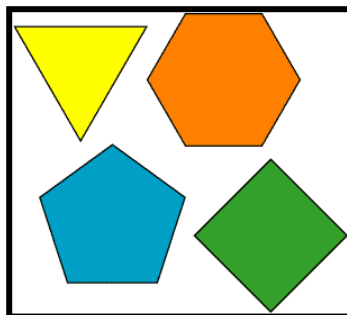
→ Vinculum = "divide by"

→ Denominator

Geometry

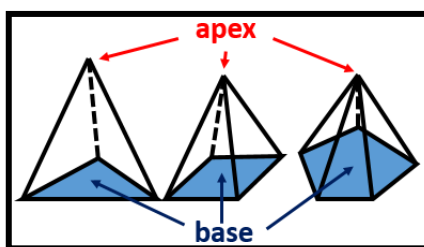
Polygon

A polygon is 2D shape with straight lines and three or more sides.



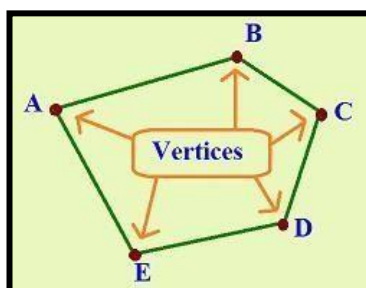
Apex

The vertex which is the highest point from the base.



Vertices

Plural of vertex



Vertex

The vertex is a corner where two or more lines meet.

