Mathematics Mastery

Glossary of terms used by Mathematics Mastery

Mastery We think of mastery of a particular part of mathematics as the point when you can apply it to a totally new problem in an unfamiliar situation – it's not likely to happen at the end of a lesson or even a unit of work, but something we're all constantly striving to achieve

The approach	
What we say	**What we mean**
C+P+A	In order to develop conceptual understanding of an idea or a procedure or a technique, firstly we should use **C**oncrete materials to represent it. When this is understood we should then move on to a **P**ictorial representation before we eventually extend our understanding to include **A**bstract forms. Most importantly, representing ideas in different forms helps to deepen our understanding and so enable us to apply ideas and skills in different contexts; it's not about C then P then A, but more C leading to C + P leading to C + P + A.
Depth	We're constantly striving to ensure pupils have a real understanding of the mathematics they are learning. Rather than just a superficial ability to memorise or repeat sets of procedures (i.e. just "do" the maths), we aim for pupils to engage at a deep level, understanding and explaining what they're doing and how/why it works. They recognise a concept in an unfamiliar context.
Fluency	Fluency is being flexible in the fundamentals of mathematics, having a deep conceptual understanding and being able to recall and apply knowledge rapidly and accurately.
Growth Mindset	People with a growth mindset believe that "ability" to so something can be increased through effort; people with a fixed mindset think that "ability" is innate and cannot be change. We firmly believe that everyone can improve at mathematics – there's no "maths gene" and sustained effort is the path the success. People believe that understanding usually requires effort, resilience and curiosity.
Key constructs	The "big ideas" in mathematics that are essential to understand to enable progress in the subject and to access other areas. These are the foci of our assessment.
Manipulatives	We often refer to the concrete materials we use in representations – such as counters, blocks, straws etc. as manipulatives; objects we can we handle, feel, move around and manipulate so we can develop our physical understanding of maths concepts as the first part of the C+P+A journey.
Problem Solving	Problem solving means applying mathematics to a variety of routine and non-routine problems including breaking down complex problems into a series of simpler steps and persevering in seeking solutions. Sometimes a problem can be in a real-life context, sometimes problems will just be within mathematics itself e.g. looking at number patterns.
Reasoning	Reasoning in mathematics can be demonstrated by following a line of enquiry, making conjectures about relationships and/or generalisations. It includes developing the skills of presenting an argument and justifying a position using appropriate mathematical language and notation.

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In lessons

Lesson structure	
What we say	**What we mean**
Do Now/ Fluency First	A short activity at the start of a lesson that pupils can engage with, probably without any input at all from the teacher. This can be something to prepare them for the material in the coming lesson or a more general activity to practise/develop fluency or keep key skills sharp
Talk Task/ Let's Explore	Almost any task can be a "talk task". We always incorporate tasks into our lessons that provide pupils with opportunities to discuss the mathematics they are working on, so developing both their reasoning and mathematical communication
Independent Task	An independent task is one which pupils should be able to perform independent of the teacher – not necessarily of each other as pair/group work may be useful in any part of the lesson and with any task
Plenary	A summary after a key part of learning (that might be at any point of the lesson) that can, for example, review and assess progress; draw out key points from the lesson, etc.
General	
What we say	**What we mean**
Bar modelling	This is way of representing a problem using pictures. It is often a very useful way of making a complex word problem more accessible to pupils. Although it is not in itself a method of solution, by "seeing" the problem in the visual form, it is them often easier for pupils to see how to approach the problem
Concrete Manipulative	Any physical object that is used to represent a mathematical concept is a concrete manipulative e.g. counters, bead strings, fraction towers, people, straws…the possibilities are endless
Dienes	Dienes blocks are concrete representations of numbers which are in exact proportion to each other, so they can represent all powers of tens, such as ones, tens, hundreds, thousands; hundredths, tenths, ones and tens; hundreds, thousands, ten thousands, hundred thousands; etc. They help pupils to understand the relationship between place value columns and see why we exchange e.g. one ten for ten ones
Geoboard	A peg board used to illustrate, for example, properties of lines and shapes, counting, number, area, etc.
Odd One Out	From a set of items, pupils are asked to identify which one is different from the others and why. Often there can be more than one answer/reason and this is useful in helping pupils to develop their reasoning
Same/Different tasks	Useful in developing reasoning, pupils are asked to compare two or more objects, expressions, representations etc. and asked to identify what they have in common and how they differ
Skip counting	Selecting a multiple and a starting point and then counting in that multiple, for example, skip counting in fives from one would be 1, 6, 11, 16, 21, 26, 31, etc.

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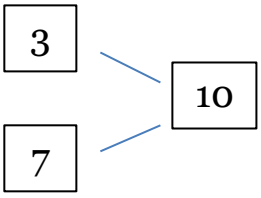
The following glossary is not meant to be a used as a dictionary of mathematical terms but contains some of the terms that are frequently used by Mathematics Mastery. An example of a mathematical dictionary can be found by clicking here.

What we say	What we mean
Approximation	The number is not exact but is close, for example, it takes 57 minutes so you might say it takes approximately one hour
Dividend	The amount that you want to divide, for example, in 12 ÷ 3 = 4, 12 is the dividend
Divisor	The number you divide by, for example, in 12 ÷ 3 = 4, 3 is the divisor
Equal to	We refer to quantities being "equal to" each other rather than "equals" as this emphasises the fact that equality works in both directions e.g. consider the equation "4 + 1 = 3 + 2". Both sides of the equation are "equal to" each other, as both give the result 5
Equation	Says that two things are equal. It will have an equal to sign, for example, 8 – 3 = 5 × 1
Equivalent	Having exactly the same value e.g. 12 ÷ 2 = 4 + 2
Estimation	Make an approximate calculation often based on rounding
Expression	Numbers, symbols and operators grouped together but without the equal to sign, for example, 5 × 3 or 6 - 1
Factor	A number, that when multiplied with other factor(s), makes a given number, for example, 2 and 3 are factors of 6 because 2 × 3 = 6
Integer	A positive or negative whole number or zero
More/fewer and greater/less (Link to more /fewer document when on toolkit)	More and fewer are used when we talk about discrete data, i.e. objects that can be counted using positive whole numbers. Greater and less are used when we talk about continuous data, i.e. data that can take any value within a range
Multiple	The result of multiplying a number by an integer, for example, 12 is a multiple of 3 and 4 because 3 × 4 = 12
Number bond	A way of representing a number using a part-part whole model, for example, if 3 and 7 are the parts then the whole is ten 
Ones	We refer to the "ones" place value column between "tens" and "tenths" as the use of the word "units" is both unnecessary and confusing; the "unit" refers to the type of measure – cm, kg etc. whereas we count in "ones"
Partitioning	A way of breaking a number into at least two parts resulting in a number bond

	for that number, for example, 12 is equal to ten and two
Product	The answer you get when you multiply two numbers
Proof	A formal mathematical argument that shows why a statement is always true
Quotient	The result after you divide the dividend by the divisor, for example in 12 ÷ 3 = 4, 4 is the quotient
Rounding	A method used to approximate a number to the nearest appropriate power of ten, for example, 11.74: 11.74 = 11.7 rounded one decimal place 11.74 = 12 rounded to the nearest whole number 11.74 = 10 rounded to the nearest multiple of ten
Sum	The result of adding two or more numbers. This is often used mistakenly to mean any calculations, but sum should only be used for additions
Vinculum	The horizontal line used to separate the numerator and denominator in a fraction