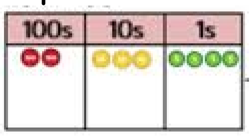
Mathematical vocabulary

The argument can be made that the following vocabulary is not necessary – I strongly disagree. Children who can explain their understanding by using vocabulary-rich language are more confident learners and can better express their reasoning. When such a wealth of understanding can be gleaned from this vocabulary, why would you not?

In phonics, children use language such as 'digraph' and 'phonemes' from entering school with confidence and understanding. With the correct modelling and high expectations, we can ensure that their maths work is similarly rich in vocabulary and understanding.

For staff

The following vocabulary is not for pupil use, but is to be understood by staff and the concepts built into masterful lessons.

Cardinality	Counting a quantity, saying each number and recognising that the final number spoken is the amount.
Subitising	Recognising a quantity by sight, as opposed to counting each individual item. Arrays are useful for this, for example recognising a role of a dice without having to count. Tens frames build this skill naturally, as does numicon.
Unitising	Recognising that representations can be used to represent more than one.  For example, each counter in the hundreds column represent 100, rather than having 300

	counters, each representing 1. Numerals themselves are examples of unitising, as one digit can represent multiple units.
Concrete – pictorial - abstract	The concept that maths can be approached in a variety of representations, and that the correct procedural variation would move through these in small steps, building on knowledge towards more abstract problems. It is a misconception that older children 'don't need' concrete experiences, as these can provide, amongst various other benefits, the chance for children to explain their reasoning and represent their working out.
Procedural variation	One of the 5 Big Ideas, procedural variation is the process of moving through a lesson or sequence of lessons in small steps, changing the non-essential features throughout a lesson so as to draw attention to the main teaching point (or essential feature). This idea is to only change and evolve things slowly, not losing sight of the main focus. Representation and Structure (another of the 5 Big Ideas) can overlap with this in ways, as moving through the concrete, pictorial, abstract journey is part of procedural variation.
Conceptual Variation	The idea of using non-concepts and non-standard concepts to test children's understanding and mastery of a concept. Non-standard concepts are when a problem may be presented in a way which is not considered standard (possibly through a different representation or an inverse operation), whereas a non-concept is when something is incorrect, and a child must use their mathematical reasoning and understanding of the concept to explain how or why, such as in a

	'Always, sometimes, never' problem or similar.
Coherence	Another of the 5 Big Ideas. The journey which children go on through a lesson or sequence of lessons, structured into small, manageable and comprehensible steps. The good practice of producing an S Plan can help with ensuring coherence is strong.

<u>EYFS/Key Stage 1</u>

Commutative	The principle that addition and multiplication problems will provide the same result, regardless of order (e.g. 5x3 = 3x5, 7+2 = 2+7) but that subtraction and division can not be changed without affecting the outcome.
Addend	The two numbers in an addition problem which are to be added to produce the sum, i.e. 4+3=7, 4 and 3 are the addends. As addition is commutative, both are simply called addends.
Sum	In the example 4+3=7, 7 is the sum. Traditionally known as the 'answer', this is not mathematically accurate in all cases, as this could also be written as 7=4+3, wherein the 'answer' is now 4+3. Using 'addend' and 'sum' removes this possible misconception.
Minuend	The first number, or starting quantity, in a subtraction problem. This should not be referred to as the 'biggest number', as this encourages misconceptions later in a child's mathematical career when they begin to look at negative

	calculations.
Subtrahend	The second number, or quantity to be subtracted, in a subtraction problem.
Difference	The result of subtracting the subtrahend from the minuend, therefore 'minuend-subtrahend=difference'. The subtrahend and the difference can be exchanged and the calculation will still be correct, e.g. 9-4=5, it could also be correct to say 9-5=4.
Reduction	A subtraction which asks you to reduce a total value, such as: I have 7 sweets. I give 3 sweets to Bob – how many do I have now?
Difference	A subtraction which asks you to find the difference between two quantities, such as: I have 7 sweets. Bob has 3 sweets. How many more sweets do I have than Bob?
Inverse	The concept that addition and subtraction are related by their 'reversible' nature, i.e. 4+5=9 is the inverse of 9-5=4. The same is true for multiplication and division, for example 4x5=20 and 20÷5=4. This skill is useful when using known facts to derive unknown facts, and developing number fluency in general.
Fluency	One of the 5 Big Ideas, fluency is much more than simply 'knowing number bonds and times tables'. The relationship between numbers and how they are connected is all part of number fluency, including partitioning and compensating to solve problems in more efficient ways.

Key Stage 2

Aggregation	An addition which asks for two or more separate groups to be totalled 'altogether' but never brought into one physical group. Such as: I have 4 sweets, Bob has 5 sweets. How many sweets do we have altogether? The word 'altogether' can often (but not always!) indicative of an aggregation.
Augmentation	An addition which asks for one quantity to be 'grown' or increased. Examples may include the temperature rising, a plant growing or simply children giving sweets to each other (growing the amount of the receiver), such as: I have 4 sweets. Bob gives me 3 more. How many do I have now? Augmentation is the inverse of reduction.
Augend	The amount something is increased by in an augmentation, such as: I have 4 sweets. Bob gives me 3 more. How many do I have now? 3 is the augend.
Factor	Numbers multiplied together in a multiplication problem are called factors. As multiplication is commutative, both are called factors. This word is also used to refer to factors of a number, such as 3 and 4 being factors of 12, as you could write 3x4=12, where 3 and 4 are factors of a calculation where the product is 12.
Product	The result of a multiplication problem, i.e. in 3x4=12, 12 is the product.
Multiple	If you can write a multiplication problem, then the product is a multiple of either of the factors. For example, 7x8 is 56, therefore 56 is a multiple of 7. Other examples would be 70, 14 or

	35. Multiples of 8 would be 8, 16, 24 or even 800 and 1600. 56 would be a common multiple of 7 and 8.
Prime	Any number which has only 2 factors (1 and itself). 1 is not a prime number, as it only has 1 factor (itself).
Dividend	The starting number in a division problem. In 24÷8=3, 24 is the dividend.
Divisor	The number dictating how many equal groups the dividend must be shared into. In 24÷8=3, 8 is the divisor (24 split into equal groups of 8, there will be 3 groups). Because division is not commutative, the dividend and the divisor cannot be swapped without affecting the quotient.
Quotient	The amount of groups which are made by dividing a dividend. The divisor and the quotient can be exchanged and the problem will still be correct, i.e. in 24÷8=3, the quotient is 3 but 24÷3=8 is also correct.