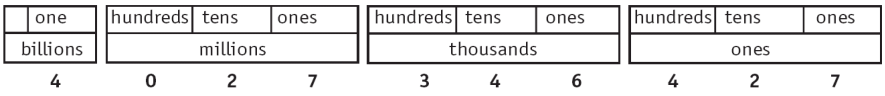
FIRST STEPS IN MATHEMATICS – GLOSSARY

TERM	MEANING / DEFINITION / ASSOCIATED LANGUAGE
Constant function	Method of adding same number repeatedly eg key into calculator 98,+,1,=,=,=
Whole Numbers	Integers (numbers) without fractions eg 1,2,3,4,
Fractions	One or more parts of a unit or whole number
Decimal Numbers Decimal Fractions	Numbers between consecutive whole numbers. eg 2.45
Ordinal Numbers	Numbers which describe a place in a series or the order in which things occur eg first, second
Cardinal Numbers	Numbers such as 1,2,3 etc which indicate how many items in a given set, but not their order.
Count	To recite whole numbers in order; or to check a collection one by one in order to say how many are in the collection.
One to one correspondence	Systematically counting a collection using both the *counting sequence*, and knowing how to use the *counting process.*
Counting sequence	Knowing the order of whole numbers and being able to recite them.
Counting process	Using the counting sequence to work out 'how many'.
Skip counting	Counting in groups in order to count large collections efficiently.
Subitising	Being able to 'see how many at a glance'. Subitising is learned through social interactions, activities and games, usually before students come to school. It develops before counting and underpins it. Collections of items in standard arrangements are easier to subitise.
Partitioning	When a number can be thought of in more than two parts. To break up a quantity and move bits from one group to another without the overall quantity.
Place Value	Place value is the key to understanding how to say, read write and calculate with whole numbers. It includes: ▪ Knowing the particular order of whole numbers and the pattern in the way we say them, helps us remember that order. ▪ Knowing how the numbers are written and the patterns that help us remember the written order. ▪ Being able to think of the same whole number broken up in different ways ▪ Place value patterns within decimal numbers. ▪ Comparing and ordering numbers.
Ones, Tens, Hundreds Pattern	
Place Value Partitioning	Splitting a number into parts (including additive partitioning and multiplicative partitioning).
Standard Partitioning	eg 582 = 500 + 80 + 2
Non-Standard Partitioning	Shows an understanding that it is the position of a digit which determines its value, and may be more helpful than standard partitioning as it encourages flexibility with numbers eg 582 = 382 + 200.
Additive Partitioning	Breaking a number into parts using addition eg 2706= 2 thousand + 7 hundred + 6
Multiplicative Partitioning	Breaking a number into parts using multiplication eg 2706 = 2x1000 + 7x100 + 0x10 + 6x1
Powers of Ten	Evident in our base 10 place value number system where each place to the left is ten times greater, while each place to the right is one tenth as much as the previous place.
Multiplicative Thinking	Understanding the constant relationship between places, with the values of the positions increasing in powers of ten from right to left. Being flexible with numbers in order to visualise situations in terms of a quantity arranged in an array, or in groups, or with relative magnitude.

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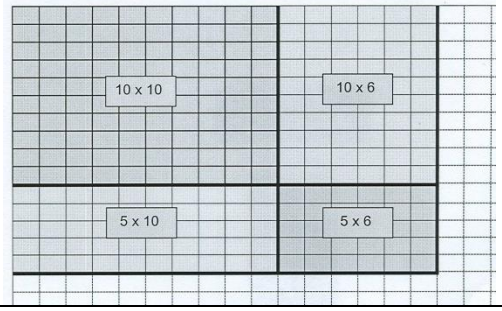
Basic Facts or Number Facts	Simple sums (to 10+10) and products (to 10x10) that students have solid understanding of and instant recall of many of them.
Mental Calculations or Mental Arithmetic	Doing calculations in your head and involves much more than recall of basic facts. It is the first resort when having to calculate as it is portable and flexible
Mental Calculation Strategies	Using basic facts, partitioning and place value in order to mentally work out an answer
Commutativity	The order in whih an operation is perfromed make no difference eg 2+6 is the same as 6+2
Inverses	Using the opposite operation to solve a sum eg 13-8, think 8 + ? =13
Compensate	To partition and then rearrange the number eg 15x6, think 15x2x3, which is 30x3=90
Compatible numbers	eg 8+7+2, it's easier to add 8+2=10 then add 7 or 68+27+12, try 68+12=80 then add 27 = 107
Bridging	eg 9+4 think 9+1+3
Front load	Start with the biggest place eg bring on the tens then ones, 28+37=38,48,58 plus 7 more = 65
Multiply in parts	Partition and multiply in parts eg 6x25 is 6x20=120 and add 6x5=30 which is 150 in total
Grid Partitions	Use place value partitions to rearrange numbers into basic facts. 
Algorithms	Standard written algorithms are special calculating methods that use step-by-step procedures for calculations that are too hard to do mentally.
Operate	Understand when and why to choose to use a particular numbers and mathematical symbols (an operation) to solve a given problem.
Calculate	Choose and use a repertoire of mental, paper and calculator computational strategies for each operation, meeting needed degrees of accuracy and judging the reasonableness of results.
Addition	Change a quantity by adding more. Think of a quantity as combined of parts. Part-part-whole: quantity of the whole unknown = addition. Add, plus, find the sum of, more than, counting on.
Open Addition	eg 123+☐=154
Subtraction	Change a quantity by taking some away. Think of a quantity as combined of parts. Equalise or compare two quantities. Part-part-whole: quantity of the part unknown = subtraction. Take away, subtract, minus, find the difference, less than.
Problem solving	Investigating real-world mathematical situations, using connections between dramatic, physical, diagrammatic, verbal and symbolic representations of the word problem.
Number sentence	Representation of a word problem using numbers and mathematical symbols
Standard number sentence	eg 8-5=☐
Non-standard number sentence	eg 8-☐=5

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Situation to Operation	Solve problems using role play, materials diagrams or numbers prior to being able to represent the problem using numbers and symbols (operate).
Situation to Calculation	When students understand the operations, they can choose to use numbers and symbols to solve a problem, rather than having to think about manipulating materials.
Think Boards	A teaching tool that help students link various ways for representing the operations
Equivalent Number Sentences	Two different number sentences which represent the same problem; they ask essentially the same question eg: ☐-16=18 18+16=☐
Change Problems	To transform one quantity by adding to or taking from it. (including result unknown, change unknown, start unknown)
Combine Problems	Consider two static quantities either separately or combined (including whole unknown, one part unknown)
Equalise Problems	Equalise two quantities – suggests and action
Compare Problems	Compare two quantities – static and doesn't immediately suggest and action
Result unknown	eg 9+7=☐, 8x9=☐
Change unknown	eg 9+☐=16, 8x☐=72
Start unknown	eg ☐+7=16, ☐x9=72
Story / Word Problems	Presenting problems to children at an early age should be in a 'story ' format, before progressing to 'word' problems. A wide range of problem types should be presented at all ages to develop flexibility and understanding of all four operations
Multiplication	Where a number (multiple) can be written as the product of other numbers (factors). The factors of a multiplication can be rearranged without changing the quantity. It is the inverse of division. Product, times, multiplied by, lots of
Repeat equal quantities	Repeated addition, skip counting, double count
Use rates	Extending repeated addition concept to apply to rates eg There are 5 petals per flower. How many petals if there are 3 flowers?
Make ratio comparisons or changes eg scales	Adjusting amounts using ratio, as in a recipe Where there are two or more sets of variables and the number of combinations are unknown eg 2 types of cones, 4 flavours of ice cream – how many combinations
Make arrays or combinations	Arrange materials in arrays or combinations eg 4 rows of 15 seats
Need products of measures	To calculate area
Division	Where a number (dividend) can be separated into parts by a divisor to find the quotient. It is useful when needing to share or group a quantity into a given number or portions, or into portions of a given size. It is the inverse of multiplication. Share, group, divide by, find the quotient, lots of
Partition (sharing) Problems	Use partition division when the quantity (whole or dividend) is known, the number of portions to be formed from the whole is known, but how much is in each portion is unknown. eg 15 lollies, 5 children, how many lollies will each child receive?
Quotition (grouping) Problems	Use quotition division when the quantity (whole or dividend) is known, the amount in each portion is known, but the number of portions is unknown eg 15 lollies, 3 lollies per child, how many children can receive 3 lollies each?
Inverse of Multiplication	All multiplication problem types have corresponding division problems. Linking the two ideas of repeating equal quantities and partitioning a quantity into equal portions can help students understand the connection between multiplication and division.
Equivalence	One situation can be represented by different operations. If the whole is unknown multiplication is required, and if one of the other quantities is unknown division is required.