

Year 8 Maths Knowledge Map – Autumn Term (Maths Mastery Curriculum)

<u>Key Word</u>	<u>Definition</u>	<u>Example</u>
Power	<p>The power of a number says how many times to use the number in a multiplication.</p> <p>It is written as a small number to the right and above the base number.</p>	$8^2 = 8 \times 8 = 64$
Root	<p>The square root of a number is a value that, when multiplied by itself, gives the number.</p> <p>Example: $4 \times 4 = 16$, so a square root of 16 is 4.</p> <p>Note that $(-4) \times (-4) = 16$ too, so -4 is also a square root of 16.</p> <p>The symbol is $\sqrt{\quad}$ which always means the positive square root.</p>	Example: $\sqrt{36} = 6$ (because $6 \times 6 = 36$)
Decimal	A Decimal Number (<i>based on the number 10</i>) contains a Decimal Point .	45.6 has 4 Tens, 5 Ones and 6 Tenths, like this:
Equivalent fraction	<p>Equivalent Fractions have the same value, even though they may look different. Why are they the same? Because when you multiply or divide both the top and bottom by the same number, the fraction keeps it's value.</p> <p>The rule to remember is:</p> <p>"Change the bottom using multiply or divide, And the same to the top must be applied"</p>	$3/10$ is equivalent to $6/20$ and $12/40$
Number line	Numbers on the left are smaller than numbers on the right.	We can use the number line to help us add. We always move to the right to add.

		<i>We can use the number line to help us subtract. We always move to the left to subtract.</i>
Prime number	A Prime Number can be divided evenly only by 1 or itself. And it must be a whole number greater than 1.	<i>7 can only be divided evenly by 1 or 7, so it is a prime number. But 6 can be divided evenly by 1, 2, 3 and 6 so it is NOT a prime number (it is a composite number).</i>
Factor	Factors are numbers we can multiply together to get another number:	<i>2 and 3 are factors of 6, because $2 \times 3 = 6$.</i>
Lowest Common Multiple (LCM)	The smallest positive number that is a multiple of two or more numbers.	<i>The Lowest Common Multiple of 3 and 5 is 15, because 15 is a multiple of 3 and also a multiple of 5. Other common multiples include 30 and 45, etc, but they are not the smallest (lowest). (Also called Least Common Multiple)</i>
Multiple	The result of multiplying a number by an integer (not by a fraction).	<ul style="list-style-type: none"> • 12 is a multiple of 3, as $3 \times 4 = 12$ • -6 is a multiple of 3, as $3 \times -2 = -6$ • But 7 is NOT a multiple of 3
Highest Common Factor (HCF)	The highest number that divides exactly into two or more numbers. When we find all the factors of two or more numbers, and some factors are the same ("common"), then the largest of those common factors is the Greatest Common Factor.	<i>The HCF of 12 and 16 is 4, because 1, 2 and 4 are common factors of both 12 and 16, and 4 is the highest.</i>

Integer	<p>A number with no fractional part.</p>	<p><i>Includes:</i></p> <ul style="list-style-type: none"> • the counting numbers {1, 2, 3, ...}, • zero {0}, • and the negative of the counting numbers {-1, -2, -3, ...} <p><i>We can write them all down like this: {..., -3, -2, -1, 0, 1, 2, 3, ...}</i></p> <p><i>Examples of integers: -16, -3, 0, 1, 198</i></p>
Improper fraction	<p>An Improper Fraction has a top number larger than (or equal to) the bottom number.</p> <p><i>It is "top-heavy"</i></p>	$\frac{3}{2} \quad \frac{7}{3} \quad \frac{16}{15} \quad \frac{15}{15} \quad \frac{99}{5}$
Square of a number	<p>A number multiplied by itself</p>	<p><i>The square of 7 is 49, because $7 \times 7 = 49$</i></p>
Cube root	<p>A cube root goes the other direction:</p> <p>3 cubed is 27, so the cube root of 27 is 3</p> <p>The cube root of a number is a special value that when cubed gives the original number.</p> <p>The cube root of 27 is 3, because when 3 is cubed you get 27</p>	<p><i>What is the Cube root of 125?</i></p> <p><i>Well, we just happen to know that $125 = 5 \times 5 \times 5$ (if you use 5 three times in a multiplication you will get 125) ...</i></p> <p><i>... so the answer is 5</i></p>
Square root	<p>A square root of a number is ...</p> <p>... a value that can be multiplied by itself to give the original number.</p> <p>A square root of 9 is ...</p>	<p><i>What are the square roots of 25?</i></p> <p>$(-5) \times (-5) = 25$</p> <p>$5 \times 5 = 25$</p> <p><i>So the square roots of 25 are -5 and +5</i></p>

	... 3 , because when 3 is multiplied by itself we get 9 .	
Denominators	The bottom number in a fraction. Shows how many equal parts the item is divided into.	<i>In the fraction $\frac{3}{4}$, the denominator is 4</i>
Algebraic notation	A branch of maths in which unknown values are represented using letters	<i>In the expression $7x$, the letter x represents an unknown value that is multiplied by 7</i>
Substitution	In Algebra "Substitution" means putting numbers where the letters are.	<i>When $x=5$, what is $x + x/2$? Put "5" where "x" is: $5 + 5/2 = 5 + 2.5 = 7.5$</i>
Rational number	<i>A number that can be made by dividing two integers. (Note: integers have no fractions.) The word comes from "ratio".</i>	<ul style="list-style-type: none"> • $1/2$ is a rational number (1 divided by 2, or the ratio of 1 to 2) • 0.75 is a rational number ($3/4$) • 1 is a rational number ($1/1$) • 2 is a rational number ($2/1$) • 2.12 is a rational number ($212/100$) • -6.6 is a rational number ($-66/10$) <p><i>But Pi is not a rational number, it is an "Irrational Number".</i></p>
Term (in algebra)	In Algebra a term is either a single number or variable, or numbers and variables multiplied together. Terms are separated by + or – signs	<i>In the expression $7x-4y$, there are two terms ($7x$ and $4y$)</i>
Coefficient	A number used to multiply a variable. Sometimes a letter stands in for the number.	<i>$6x$ means 6 times x, and "x" is a variable, so 6 is a coefficient.</i>
Like and unlike terms	"Like terms" are terms whose variables (and their exponents such as the 2 in x^2) are the same. In other words, terms that are "like" each other.	<p style="text-align: center;">$7x \quad x \quad -2x$</p> <p>Are all like terms because the variables are all x</p>

	Note: the coefficients (the numbers you multiply by, such as "5" in 5x) can be different.	
Linear equations	An equation that makes a straight line when it is graphed. Often written in the form: $y = mx + b$	$7x - 3 = 11$ is a linear equation