**MATHS: Number and Place Value**

| PLACE VALUE | ADDITION AND SUBTRACTION | MULTIPLICATION AND DIVISION | FRACTIONS, DECIMALS, PERCENTAGES |
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| Count to and across 100 from any given number. | Know and represent number bonds to 20 and their related subtraction facts. | To identify equal groupings as the first step in multiplying; to reinforce the idea that the arrangement of objects does not impact on the number of objects. | To split an object (shape) into two equal parts; to identify shapes that have been split into two equal parts. |
| To understand the value of the tens and ones digits in a number; to use multiple methods of representing and constructing a number. | To recognise these symbols = + - and write number sentences using them. | To understand that doubling is creating an identical number to the one you started with; to understand that doubling is the same as saying two groups of the same amount. | To split an object (shape) into four equal parts; to identify shapes that have been split into four equal parts. |
| Read and write numbers up to 100 in numerals and words. | To add to 20 by separating the ones and tens | To solve word problems using equal groupings as the basis for multiplication. | Share and group objects into halves and quarters; to determine half of a number and a quarter of a number. |
| To count in sequences of 2, 5 and 10. | To subtract within 20 by subtracting from only the ones column. | Divide even numbers into equal groups using concrete materials. | Recognise, find, name and write fractions 1/3, $\frac{1}{4}$, 2/4, $\frac{1}{2}$ of a length, shape or quantity. |
| Count numbers up to 100, counting by 1, 2, 5, 10. | To apply addition and subtraction to multi-step word problems; to use number bonds to make 10 when adding. | Divide even numbers equally into groups. | Write simple fractions (for example $\frac{1}{2}$ of 6 = 3.) |
| Count numbers in 3s. | To use pictorial and visual representations to help solve word problems. | Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers | Recognise the equivalence of 2/4 and $\frac{1}{2}$. |
| Recognise the place value of a 2 digit number (tens and ones). | Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. | Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs | Count up in fractions ( $\frac{1}{2}$, 1, 1 $\frac{1}{2}$ , 2 ) |
| Recognise and describe patterns with more complex numbers, in particular 3 and 5. | Add and subtract numbers using concrete objects, pictorial representations, and mentally 2 digit and ones, 2 digit and tens) | Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot | I can recognise, find and write fractions of a set of objects: unit fractions (where the numerator is 1) and non-unit fractions |

# Maths NPV Sticky Knowledge

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| Read and write numbers to at least 100 in numerals. | Add and subtract using concrete objects and pictorial representations, including those involving numbers, quantities and measures. | Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts | I can recognise and use fractions as numbers: unit fractions (where the numerator is 1) and non-unit fractions (where the numerator is not 1) with small denominators. |
| | Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. | I can multiply a 2 digit number by a single digit number using a mental method, then progress to formal written methods | I can compare and order unit fractions, and fractions with the same denominators. |
| Read and write numbers to 100 in words. | Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. | I can solve problems using multiplication and division facts for x3, x4 and x8, including missing number problems. | I can solve problems that involve fractions. |
| I can count in multiples of 4, 8, 50 and 100. | I can use column addition and subtraction for numbers with up to 3-digits as a written method. | I can recall multiplication and division facts for up to 12 x 12 | I can write any number of tenths and hundreds as a decimal and recognise fraction equivalences eg. 0.7 = 7/10 / 0.07 = 7/100 |
| I can recognise the value of each digit in a 3 digit number | I can use the inverse operation to check my answers | I can use formal written layout to multiply 2-digit and 3-digit numbers by a one-digit number. | I know the decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$. |
| I can order and compare numbers up to 1000 | I can add and subtract numbers mentally (3 digit number and ones, tens and hundreds). | I can solve problems involving x and + including: corresponding problems such as n objects are connected to m objects. | I can round decimals with one decimal place to the nearest whole number. |
| I can read and write numbers up to 1000 | I can use addition and subtraction to solve number problems. | I can solve problems involving x and + including: problems involving scaling numbers (eg. 8 x 8 = 64 so 80 x 80 = 6400) | I can identify equivalent fractions of a given fraction, represented visually, including tenths and hundredths. |

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| I can solve number problems and practical problems involving place value ideas | I can use column addition and subtraction for numbers with up to 4-digits. | I can solve problems involving x and + including: using the distributive law to multiply two-digit numbers by a one-digit number (eg. 206 x 4 = 200x4 + 6x4 | I can recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number |
| I can count in multiples of 6, 7, 9, 25 and 1000. | I can solve two step problems using addition and subtraction, deciding which operations and methods to use and why. | I can identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers | I can round decimals with 2 decimal places to the nearest whole number and to 1 decimal place |
| I can round any number to the nearest 10, 100 or 1000. | I can solve addition and subtraction multi-step problems, deciding which operations and methods to use and why. | I know and can use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers (up to 100) | I can recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction |
| I can count backwards through zero to include negative numbers. | I can use column addition and subtraction for numbers with more than 4-digits. | I can use a formal written method to multiply numbers up to 4 digits by a one or two-digit number, including long multiplication (interpreting remainders) | I can add and subtract fractions with the same denominator and multiples of the same number. |
| I understand the value of each digit in a 4-digit number. | I can add and subtract numbers mentally with increasingly large numbers | I can use short division to divide numbers up to 4 digits by a one-digit number, I can use a remainder. | I can read and write decimal numbers as fractions (e.g. 0.71 = 71/100) |
| I can order and compare numbers beyond 1000. | I can use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy | I can multiply and divide whole and decimal numbers by 10, 100 and 1000 | I can solve problems involving percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25. |
| I can read and write and order numbers to 1,000,000 and recognise the value of each digit. | I can use knowledge of order of operations to carry out calculations involving brackets and understand what BODMAS means. | I can recognise and use square numbers and cube numbers, and the notation for squared ($^2$) and cubed ($^3$) | I can compare and order fractions, including fractions greater than 1. |
| I can count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 | I can use formal methods to solve multi-step problems. | I can solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes | I can add and subtract fractions with different denominators; and multiply and divide pairs of fractions, expressing my answer in its simplest form. |

# Maths NPV Sticky Knowledge

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| I can round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000 | I can solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | I can use long division for 4dgt / 2dgt and deal with the remainder | I can recall and use equivalences between simple fractions, decimals and percentages. |
| I understand what negative numbers are and when they might be used. | I can solve problems involving addition, subtraction, multiplication and division | I can use long multiplication for 4dgt x 2 dgt | I can solve problems involving ratio (e.g. 2:1) where missing values can be found by scaling up or down using multiplication and division facts. |
| I understand and can use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. | I can use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy | I can identify common factors, common multiples and prime numbers | I can calculate given percentages (e.g. of measures, and such as 15% of 360) and use percentages for comparison (eg. 20% blue 80% red) |
| I can read Roman numerals to 1,000 (M) and recognise years written in Roman numerals | | | |
| I can read and write any number up to 10 000 000 and determine the value of each digit.(This includes large numbers and decimals). | | | |
| I can round any whole number to any required degree of accuracy (nearest 10, 100, and 1000). | | | |
| I can use negative numbers in context, and calculate intervals across 0 | | | |

## MATHS: Algebra

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| I can use simple formulae |
| I can generate and describe linear number sequences |
| I can express missing number problems algebraically |
| I can find pairs of numbers that satisfy an equation with 2 unknowns |