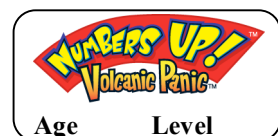
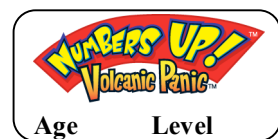


UK Mathematics R-9 Curriculum Objectives Addressed Within Numbers Up! Volcanic Panic



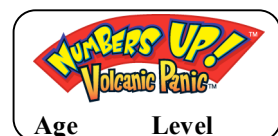
| Age | Level | UK Level | Numeracy Yearly Teaching Objectives |
|-----|-------|----------|--|
| 4-5 | 1-6 | R | <p>Numbers and the Number System</p> <p>Counting, Comparing and Ordering Numbers Say and use the number names in order in familiar contexts Count reliably up to 10 everyday objects Recognise numerals 1 to 9, then 0 and 10, then beyond 10 Use language such as <i>more</i>, <i>less</i>, <i>greater</i>, <i>smaller</i> to compare 2 numbers Say a number which lies between 2 numbers Order a given set of numbers Order a given set of selected numbers Begin to understand and use ordinal numbers in different contexts</p> <p>Adding and Subtracting Begin to use the vocabulary involved in adding and subtracting Find one more or less than a number from 1 to 10 Begin to relate addition to combining 2 groups of objects Extend to 3 groups of objects Begin to relate addition to counting on Find a total by counting on when one group of objects is hidden Separate a given number of objects into 2 groups Select 2 groups of objects to make a given total Begin to relate subtraction to taking away and counting how many are left Work out by counting how many more objects are needed to make a larger number</p> |
| 6-7 | 6 -8 | Year 1 | <p>Counting, Properties of Numbers and Number Systems Count reliably to at least 20 objects Count on and back in ones from any small number, and in tens from and back to zero. Count in twos from 0, then 1 Begin to recognise odd and even numbers to at least 20 Count on in fives from 0 to 20 Read and write numerals from 0 to at least 20 Understand and use the vocabulary of comparing and ordering numbers including ordinal numbers to at least 20 Within the number range 1-30, say the number that is 10 more or less than any given number Order numbers to at least 20 Understand and use the vocabulary of estimation</p> <p>Calculations Understand the operation of addition, and of subtraction (as <i>take away</i>, <i>difference</i> and <i>how many more to make...</i>) and use the related vocabulary Begin to recognise that addition can be done in any order</p> |

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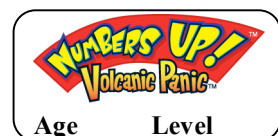
| Age | Level | UK Level | Numeracy Yearly Teaching Objectives |
|-----|-------|----------|--|
| | | | <p>Begin to use the + and = signs</p> <p>Begin to recognise the use of symbols to stand for an unknown number</p> <p>Begin to recognise that more than two numbers can be added together</p> <p>Know by heart all pairs of numbers with a total of 10 and the corresponding subtraction facts</p> <p>Begin to bridge through 10, and later 20, when adding a single-digit number</p> <p>Solving Problems</p> <p>Choose and use appropriate number operations and mental strategies to solve problems</p> <p>Problems involving real life, money and measures</p> |
| 7-8 | 9-11 | Year 2 | <p>Counting, Properties of Numbers and Number Systems</p> <p>Say the number names in order to at least 100, from and back to zero</p> <p>Describe and extend simple number sequences. Count on or back in ones or tens starting from any 2-digit number</p> <p>Recognise odd and even numbers</p> <p>Place Value and Ordering</p> <p>Read and write whole numbers to at least 100 in figures and words</p> <p>Know what each digit in a 2-digit number represents, including 0 as a place-holder, and partition 2-digit numbers into a multiple of ten and ones. (TU)</p> <p>Compare and order whole numbers to 100</p> <p>Use the = sign to represent equality</p> <p>Say the number that is 10 more or less than any 2-digit number</p> <p>Round numbers less than 100 to the nearest 10</p> <p>Fractions</p> <p>Begin to recognise and find one half and one quarter of shapes and small numbers of objects</p> <p>Begin to recognise that two halves or four quarters make one whole and that two quarters and one half are equivalent</p> <p>Addition and Subtraction</p> <p>Extend understanding of the operations of addition and subtraction</p> <p>Recognise that addition can be done in any order but not subtraction</p> <p>Begin to add three single-digit numbers mentally (totals up to about 20)</p> <p>Understand that subtraction is the inverse of addition</p> <p>Know by heart all addition and subtraction facts for each number to at least 10 – all pairs of numbers with a total of 20 and all pairs of ten multiples with a total of 100</p> <p>State the subtraction corresponding to a given addition and vice</p> |

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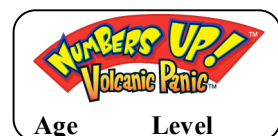
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|-----|-------|----------|--|
| | | | <p>versa</p> <p>Use mental addition and subtraction to solve simple word problems involving numbers in real life, money or measures, using one or two steps.</p> |
| 8-9 | 12-14 | Year 3 | <p>Counting, Properties of Numbers and Number Sequences Describe and extend number sequences Count on or back in tens or hundreds from any two- or three-digit number Count on or back in twos starting from any two-digit number, and recognise odd and even numbers to at least 100 Recognise two-digit and three-digit multiples of 2, 5 or 10, and three-digit multiples of 50 and 100</p> <p>Place Value and Ordering Read and write whole numbers to at least 1 000 in figures and words Know what each digit represents and partition three-digit numbers into a 100 multiples, a 10 multiple and ones (HTU) Say the number that is 1, 10 or 100 more or less than any given two- or three-digit number Compare and order numbers to at least 1 000</p> <p>Estimation Round any two-digit number to the nearest 10 and any three-digit number to the nearest 100</p> <p>Fractions Recognise unit fractions such as one-half, one-third, one-quarter, one-fifth and one-tenth, and use them to find fractions of shapes and numbers Begin to recognise simple fractions that are several parts of a whole such as three-quarters, two-thirds or three-tenths Begin to recognise simple equivalent fractions Compare and order familiar fractions Estimate a simple fraction</p> <p>Calculations Addition and Subtraction Extend understanding of the operations of addition and subtraction Add three or four single-digit numbers mentally Extend understanding that subtraction reverses addition Add and subtract mentally a <i>near multiple of 10</i> to or from a two-digit number by adding or subtracting the tens number and adjusting Use patterns of similar calculations</p> |

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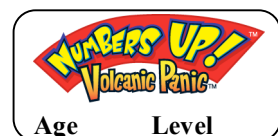
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|------|-------|----------|---|
| | | | <p>Say or write a subtraction statement corresponding to a given addition statement and vice versa</p> <p>Use known number facts and place value to add/subtract mentally</p> <p>Multiplication and Division</p> <p>Understand multiplication as repeated addition</p> <p>Understand division as grouping (repeated subtraction) or sharing</p> <p>Recognise that division is the inverse of multiplication</p> <p>Begin to find remainders after simple division</p> <p>Round up or down after division, depending on the context</p> <p>Know by heart multiplication and division facts for the 2, 5 and 10 times tables</p> <p>Begin to use the mental strategies related to multiplying by 10 and 100</p> <p>Say or write a division statement corresponding to a given multiplication statement</p> <p>Use known number facts and place value to carry out mental multiplications and divisions</p> <p>Solve word problems involving real life, money and measurement</p> |
| 9-10 | 15-16 | Year 4 | <p>Numbers and the number system</p> <p>Place value, ordering and rounding (whole numbers)</p> <p>Read and write whole numbers to at least 10 000 in figures and words, and know what each digit represents</p> <p>Partition numbers into thousands, hundreds, tens and ones</p> <p>Add/subtract 1, 10, 100 or 1 000 to/from any integer, and count on or back in tens, hundreds or thousands from any whole number up to 10 000</p> <p>Multiply or divide any integer up to 1 000 by 10 (whole number answers), and understand the effect</p> <p>Begin to multiply by 100</p> <p>Compare and order numbers less than 10 000</p> <p>Make and justify estimates up to about 250, and estimate a proportion</p> <p>Round any positive integer less than 1 000 to the nearest 10 or 100</p> <p>Properties of numbers and number sequences</p> <p>Recognise and extend number sequences formed by counting from any number in steps of constant size</p> <p>Recognise odd and even numbers up to 1 000</p> <p>Recognise multiples of 2, 3, 4, 5 and 10, up to the tenth multiple</p> <p>Fractions and Decimals</p> <p>Use fraction notation.</p> <p>Recognise simple fractions that are several parts of a whole, such as $\frac{2}{3}$ or $\frac{5}{8}$, and mixed numbers.</p> <p>Recognise the equivalence of simple fractions (e.g. fractions</p> |

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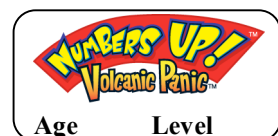
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|-----|-------|----------|---|
| | | | <p>equivalent to $\frac{1}{2}$, $\frac{1}{4}$ or $\frac{3}{4}$</p> <p>Order simple fractions</p> <p>Begin to relate fractions to division and find simple unit fractions of numbers or quantities</p> <p>Begin to use ideas of simple proportion e.g. <i>one for every...</i> and <i>one in every</i></p> <p>Understand decimal notation and place value for tenths and hundredths and use in context e.g. money</p> <p>Recognise the equivalence between the decimal and fraction forms of one half and one quarter, and tenths such as 0.3</p> <p>Addition and Subtraction</p> <p>Consolidate understanding of relationship between + and –</p> <p>Understand the principles (not the names) of the commutative and associative laws as they apply or not to addition and subtraction</p> <p>Rapid recall of addition and subtraction facts for all numbers to 20</p> <p>Derive quickly all number pairs that total 100 and all pairs of multiples of 50 with a total of 1 000</p> <p>Find a small difference by counting up</p> <p>Count on or back in repeated steps of 1, 10 or 100</p> <p>Add three 2-digit multiples of 10</p> <p>Use known number facts and place value to add or subtract mentally, including any pair of 2-digit whole numbers</p> <p>Understanding multiplication and division</p> <p>Extend understanding of the operations of x and ÷ and their relationship to each other and to + and –</p> <p>Understand the principles (not the names) of the commutative, associative and distributive laws as they apply to multiplication</p> <p>Find remainders after division</p> <p>Round up or down after division, depending on the context</p> <p>Know by heart multiplication facts for 2, 3, 4, 5 and 10 times-tables</p> <p>Derive corresponding division facts</p> <p>Use appropriate mental calculation strategies – doubling and halving, closely related facts, partitioning, place value.</p> <p>Choose and use appropriate number operations</p> <p>Use all four operations to solve word problems involving numbers in real life, money and measurement, using one or more steps, including conversion between related units</p> |

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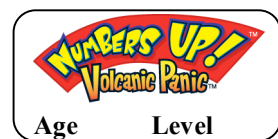
| Age | Level | UK Level | Numeracy Yearly Teaching Objectives |
|-------|-------|----------|--|
| 10-11 | 17-18 | Year 5 | <p>Numbers and the number system</p> <p>Place value, ordering and rounding</p> <p>Read and write whole numbers in figures and words, and know what each digit represents</p> <p>Multiply and divide any positive integer up to 10 000 by 10 or 100, and understand the effect</p> <p>Compare and order numbers less than 1 million</p> <p>Use the vocabulary of estimation and approximation, make estimates of large numbers, and estimate simple proportions such as one-third, seven-tenths.</p> <p>Round any integer up to 10 000 to the nearest 10, 100 or 1 000</p> <p>Order a given set of positive and negative integers (e.g. on a number line, on a temperature scale)</p> <p>Calculate a temperature rise or fall across 0°C.</p> <p>Properties of numbers and number sequences</p> <p>Recognise and extend number sequences formed by counting from any number in steps of constant size, including increments of 0.1, 0.2, etc</p> <p>Recognise multiples of 6, 7, 8, 9, up to the tenth multiple</p> <p>Know and apply test of divisibility by 2, 4, 5, 10 or 100</p> <p>Know squares of numbers to at least 10x10</p> <p>Find all the pairs of factors of any number up to 100</p> <p>Fractions, Decimals and Percentages, Ratio & proportion</p> <p>Use fraction notation, including mixed numbers, and the vocabulary <i>numerator</i> and <i>denominator</i></p> <p>Change an improper fraction to a mixed number</p> <p>Recognise when two simple fractions are equivalent, including relating hundreds to tenths</p> <p>Order a set of fractions</p> <p>Relate fractions to division, and use division to find simple fractions, including tenths and hundredths, of numbers and quantities</p> <p>Solve simple problems using ideas of ratio and proportion</p> <p>Use decimal notation for tenths and hundredths</p> <p>Know what each digit represents in a number with up to two decimal places</p> <p>Order a set of numbers or measurements with the same number of decimal places</p> <p>Round a number with one or two decimal places to the nearest integer</p> <p>Relate fractions to their decimal representations</p> <p>Begin to understand percentage as the number of parts in every 100, and find simple percentages of small whole-number quantities</p> <p>Express one half, one quarter, three quarters, and tenths and</p> |

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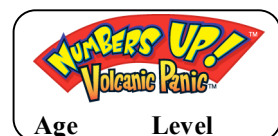
| Age | Level | UK Level | Numeracy Yearly Teaching Objectives |
|-------|-------|----------|---|
| | | | <p>hundredths, as percentages</p> <p>Calculations</p> <p>Addition and Subtraction</p> <p>Derive quickly:- decimal pairs that total 1 All 2-digit pairs that total 100 All pairs of 50-multiples that total 1 000</p> <p>Find differences by counting up through the next multiple of 10, 100 or 1 000</p> <p>Add or subtract the nearest multiple of 10 or 100, then adjust</p> <p>Add several numbers</p> <p>Use known number facts and place value for mental addition and subtraction</p> <p>Column addition/subtraction of two integers less than 10 000</p> <p>Addition or subtraction of a pair of decimal fractions with the same number of decimal places</p> <p>Multiplication and Division</p> <p>Know by heart all multiplication facts up to 10x10</p> <p>Derive corresponding division facts</p> <p>Use doubling and halving, starting from known facts</p> <p>Use known facts and place value to multiply and divide mentally</p> <p>Solving Problems</p> <p>Choose and use appropriate number operations to solve problems</p> <p>Use all four operations to solve simple word problems involving numbers and quantities based on real life, money and measures, using one or more steps, including making simple conversions between units and finding simple percentages</p> |
| 11-12 | 19-20 | Year 6 | <p>Numbers and the number system</p> <p>Place value, ordering and rounding</p> <p>Multiply and divide decimals mentally by 10 or 100, and integers by 1 000, and explain the effect</p> <p>Use the vocabulary of estimation and approximation</p> <p>Consolidate rounding an integer to the nearest 10, 100 or 1 000.</p> <p>Find the difference between a positive and a negative integer, or two negative integers, in a context such as temperature or a number line, and order a set of positive or negative integers</p> <p>Properties of numbers and number sequences</p> <p>Recognise and extend number sequences, such as the sequence of square numbers, or the sequence of triangular numbers</p> <p>Count on and back in steps of 0.1, 0.2, 0.25, 0.5</p> <p>Recognise multiples up to 10x10. Know and apply tests of divisibility. Find simple common multiples.</p> <p>Recognise squares of numbers to at least 12x12</p> <p>Recognise prime numbers to at least 20</p> |

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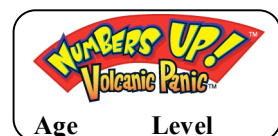
| Age | Level | UK Level | Numeracy Yearly Teaching Objectives |
|-----|-------|----------|--|
| | | | <p>Fractions, decimals, percentages, ratio and proportion</p> <p>Change an improper fraction to a mixed number and vice versa</p> <p>Recognise relationships between fractions</p> <p>Reduce a fraction to its simplest terms by cancelling common factors</p> <p>Order fractions</p> <p>Use a fraction as an operator to find fractions of numbers or quantities</p> <p>Solve simple problems involving ratio and proportion</p> <p>Use decimal notation for tenths and hundredths. Know what each digit represents in a number with up to three decimal places</p> <p>Order a mixed set of numbers with up to three decimal places</p> <p>Round a number with two decimal places to the nearest tenth or to the nearest whole number</p> <p>Recognise the equivalence between the decimal and fraction forms of one half, one quarter, three quarters, one eighth and tenths, hundredths and thousandths.</p> <p>Understand percentage as the number of parts in every hundred. Express simple fractions as percentages.</p> <p>Find simple percentages of small whole-number quantities</p> <p>Mental Calculation Strategies</p> <p>Consolidate all previous strategies</p> <p>Use known number facts and place value to consolidate mental addition/subtraction</p> <p>Extend to column addition and subtraction of numbers involving decimals</p> <p>Understand and use the relationships between the four operations, and the principles (not the names) of the arithmetic laws.</p> <p>Use brackets</p> <p>Express a quotient as a fraction or as a decimal rounded to one decimal place. Divide £.p. by a 2-digit number to give £.p.</p> <p>Round up or down after division, depending on the context</p> <p>Solving Problems</p> <p>Identify and use appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities based on real life, money or measures, using one or more steps, including converting units and calculating percentages</p> |

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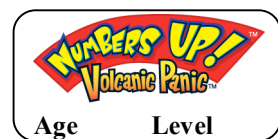
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|-------|-------|----------|--|
| 12-13 | 21-22 | Year 7 | <p>Numbers and the number system</p> <p>Place value, ordering and rounding Understand and use decimal notation and place value; multiply and divide integers and decimals by 10, 100, 1 000 Compare and order decimals in different contexts; know that when comparing measurements, they must be in the same units Round positive whole numbers to the nearest 10, 100 or 1 000 and decimals to the nearest whole number or one decimal place</p> <p>Integers, powers and roots Understand negative numbers as positions on a number line, order, add and subtract positive and negative integers in context Recognise and use multiples, factors (divisors), common factor, highest common factor and lowest common multiple in simple cases, and primes (less than 100); use simple tests of divisibility Recognise squares of numbers to 12x12 and the corresponding square roots</p> <p>Fractions, decimals, percentages, ratio and proportion Use fraction notation to describe parts of shapes and to express a smaller whole number as a fraction of a larger one; simplify fractions by cancelling all common factors and identifying equivalent fractions Begin to add and subtract simple fractions and those with common denominators; calculate simple fractions of quantities and measurements (whole number answers); multiply a fraction by an integer Understand percentage as <i>the number of parts per hundred</i>; recognise the equivalence of percentages, fractions and decimals; calculate simple percentages and use percentages to compare simple proportions Understand the relationship between ratio and proportion; use direct proportion in simple contexts; use ratio notation, reduce ratio to its simplest form and divide a quantity into two parts in a given ratio; solve simple problems about ratio and proportion using informal strategies</p> <p>Calculations Understand addition, subtraction, multiplication and division as they apply to whole numbers and decimals; know how to use the laws of arithmetic and inverse operations Consolidate the rapid recall of number facts, including positive integer complements in 100 and multiplication facts to 10x10, and quickly derive associated division facts Extend mental methods of calculation to include decimals, fractions and percentages Make estimates and approximations of calculations</p> |

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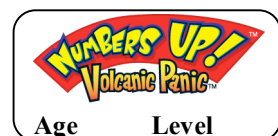
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|-------|-------|----------|--|
| | | | <p>Problem Solving Solve word problems and investigate in a range of contexts Identify the necessary information to solve a problem Break a complex calculation into simpler steps</p> |
| 13-14 | 23-24 | Year 8 | <p>Numbers and the number system Place value, ordering and rounding Read and write positive integer powers of 10; multiply and divide integers and decimals by 0.1, 0.01 Order decimals Round positive numbers to any given power of 10; round decimals to the nearest whole number or to one or two decimal places Integers, powers and roots Add, subtract, multiply and divide integers Recognise and use multiples, factors (divisors), common factor, highest common factor and lowest common multiple in simple cases, and primes Use squares, positive and negative square roots, cubes and cube roots, and index notation for small positive integer powers Fractions, decimals, percentages, ratio and proportion Order fractions Add and subtract fractions Calculate fractions of quantities Multiply and divide an integer by a fraction Express one number as a percentage of another Use the equivalence of fractions, decimals and percentages to compare proportions Calculate percentages, and find the outcome of a given percentage increase or decrease Reduce a ratio to its simplest form, including ratio expressed in different units Divide a quantity into two or more parts in a given ratio Use the unitary method to solve simple word problems involving ratio and direct proportion Calculations</p> |

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| Age | Level | UK Level | Numeracy Yearly Teaching Objectives |
|-------|-------|----------|--|
| 14-15 | 25-26 | Year 9 | <p>Understand addition and subtraction of fractions and integers, and multiplication and division of integers</p> <p>Use the laws of arithmetic and inverse operations</p> <p>Recall known facts, including fraction to decimal conversions</p> <p>Use known facts to derive unknown facts, including products involving numbers such as 0.7 and 6, and 0.03 and 8</p> <p>Consolidate and extend mental methods of calculation, working with decimals, fractions and percentages, squares and square roots, cubes and cube roots</p> <p>Solve word problems mentally</p> <p>Make estimates and approximations of calculations</p> <hr/> <p>Numbers and the number system</p> <p>Place value, ordering and rounding</p> <p>Extend knowledge of integer powers of 10</p> <p>Multiply and divide by any integer power of 10</p> <p>Begin to write numbers in Standard Form</p> <p>Round numbers to the nearest whole number, or to one, two or three decimal places</p> <p>Round numbers to a given number of significant figures; understand upper and lower bounds</p> <p>Integers, powers and roots</p> <p>Use index notation for integer powers and simple instances of the index laws</p> <p>Know and use the index laws for multiplication and division of positive integer powers</p> <p>Begin to extend understanding of index notation to negative and fractional powers</p> <p>Fractions, decimals, percentages, ratio and proportion</p> <p>Recognise when fractions or percentages are needed to compare proportions</p> <p>Solve problems involving percentage changes</p> <p>Use proportional reasoning to solve a problem, choosing the correct number to take as 100% or as a whole</p> <p>Understand the implications of enlargement for area and volume</p> <p>Compare two ratios</p> <p>Interpret and use ratio in a range of contexts, including solving word problems</p> <p>Calculations</p> <p>Understand the effects of multiplying and dividing by numbers between 0 and 1</p> <p>Use the laws of arithmetic and inverse operations</p> |

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| Age | Level | UK Level | Numeracy Yearly Teaching Objectives |
|-------|-------|-----------------------|--|
| | | | <p>Recognise and use reciprocals Understand the order of precedence and the effect of powers Use known facts to derive unknown facts Extend mental methods of calculation, working with decimals, fractions, percentages, factors, powers and roots. Solve word problems mentally Make estimates and approximations of calculations Use standard column procedures to add and subtract integers and decimals of any size, including a mixture of large and small numbers with differing numbers of decimal places</p> |
| 14-15 | 25-26 | Year 9 Able pupils | <p>Numbers and the number system Place value, ordering and rounding Write numbers in standard form Understand upper and lower bounds; round numbers to three decimal places and a given number of significant figures Integers, powers and roots Know and use the index laws for multiplication and division of positive integer powers Begin to extend understanding of index notation to negative and fractional powers Fractions, decimals, percentages, ratio and proportion Understand the implications of enlargement for area and volume</p> |