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**Year 5 Objectives**

**Place Value**

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| COUNTING   * Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero. * Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000. * Count on/back in equal steps (e.g. 25, 100, 0.1, 0.2), including beyond zero. |
| COMPARING NUMBERS   * Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit. * Use the vocabulary of comparing and ordering numbers. * Make general statements about odd and even numbers, including sums and differences. * Give one or more numbers lying between two others. * Use symbols <, =, >, ≥, £ . * Order a set of whole numbers less than 1 million. * Order positive and negative integers (number line, temperature). * Calculate a temperature rise or fall across 0\*C. |
| IDENTIFYING, REPRESENTING & ESTIMATING NUMBERS   * Use vocabulary of estimation and approximation. * Make and justify estimates of large numbers and estimate simple proportions. |
| READING & WRITING NUMBERS   * Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit. * Read and write whole numbers 100,000. * Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. |
| ROUNDING   * Round any number up to 1,000,000 to the nearest 10, 100, 1 000, 10000 and 100000. * Round any three or four digit number to the nearest 10, 100 or 1000. * Round decimals with two decimal places to the nearest whole number and to one decimal place. |
| PROBLEM SOLVING   * Solve number problems and practical problems that involve all of the above * Solve mathematical problems or puzzles. * Make and investigate a general statement about numbers, by finding examples that satisfy it. * Explain a generalised relationship in words. |

**Addition and Subtraction**

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| NUMBER BONDS   * Decimal complements within 1 and 10. * Recall addition and subtraction facts for each number up to 20. * Find pairs with sum of 100; derive multiples of 50 with a sum of 1000. |
| MENTAL CALCULATION   * Add and subtract numbers mentally with increasingly large numbers. * Revision of mental strategies for adding and subtracting. * Add / subtract any pair of 2-digit numbers, including crossing 100. * Find difference by counting up through next multiple of 10, 100, 1000. * Partition into HTU and add most significant digits first. |
| WRITTEN METHODS   * Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). * Also include + and – of money and time. * Extend written methods +/- of two integers less than 10000 and + and – a pair of decimals both with 1 or 2 decimal places. |
| INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS   * Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy. * Check calculations using inverse operation, including with calculator. * Check by adding in reverse order, including with calculator. |
| PROBLEM SOLVING   * Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. * Develop calculator skills and use a calculator effectively. * Use all four operations to solve money and 'real life' word problems. * Choose appropriate operations/ calculation methods. Explain working. |

**Multiplication and Division**

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| MULTIPLICATION & DIVISION FACTS   * Multiplication & Division facts e.g x18 by using x9 and multiplying. * Recall facts in times tables up to x12 and derive division facts. * Use known facts and place value to multiply and divide mentally. |
| MENTAL CALCULATION   * Multiply and divide numbers mentally drawing upon known facts * Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. * Multiply and divide any positive whole number up to 10 000 by 10 or 100 and understand the effect. * Understand the effect of and relationships between the four operations, and the principles of arithmetic laws as they apply to multiplication. * Express a quotient as a fraction, or as a decimal when dividing a whole number by 2, 4, 5, 10 or when dividing £ and pence. * Round up or down depending on the context. * Double or halve any number up to 100. * Double any whole number to 100 and multiples of 10 to 1000. * Identify near doubles e.g. 1.5 + 1.6. * Halve any two-digit number. |
| WRITTEN CALCULATION   * Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers. * Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. * Extend written methods to HTU x U or U.t x U. * Extend written methods to TU x TU (long multiplication). * Multiply decimals. |
| PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE & CUBE NUMBERS   * Know square numbers to 10 x 10. * Identify factors of two- digit numbers. * Use factors. * Find all the pairs of factors of any number up to 100. |
| PROBLEM SOLVING   * Use all four operations to solve money or 'real life' word problems, including percentages. * Use all four operations to solve measurement word problems, including time. * Choose appropriate operations/calculation methods. Explain working. |
| INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS   * Approximate first. * Check with inverse operation or equivalent calculation. |

**Algebra**

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| EQUATIONS   * Solve problems, including **missing number** problems, using number facts, place value, and more complex addition and subtraction. * Begin to use brackets. |
| FORMULAE   * Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit. |
| SEQUENCES   * Recognise and extend number sequences formed by counting from any number in steps of a constant size, extend beyond zero when counting back. * Solve number puzzles, recognise patterns, generalise and predict. |

**Fractions including decimals and percentages**

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| COUNTING IN FRACTIONAL STEPS   * Count up and down in hundredths. |
| RECOGNISING FRACTIONS   * Recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. * Recognise simple equivalent fractions, including tenths and hundredths. * Know simple fractions as percentages. * Relate fractions to decimal forms (including tenths, hundredths), and to percentages. |
| COMPARING FRACTIONS   * Compare and order unit fractions 1/3, ¼ and 1/2, and fractions with the same denominators. * Use fraction notation, including mixed numbers, and vocabulary numerator and denominator. * Change an improper fraction to a mixed number. * Order a set of fractions including mixed numbers, position on a number line. * Relate fractions to division and find simple fractions, including 1/10 and 1/100, of numbers and quantities. * Use a calculator effectively e.g. to convert fractions to decimals, to find fractions of numbers. * Find fractions and simple percentages of whole number quantities. |
| COMPARING DECIMALS   * Compare numbers with the same number of decimal places up to two decimal places. * Use decimal notation for tenths and hundredths, know what each digit represents in numbers with up to two decimal places. * Begin to understand percentage as the number of parts in every 100. * Order a set of numbers or measurements with same number of decimal places. |
| ROUNDING INCLUDING DECIMALS   * Round decimals with one decimal place to the nearest whole number. * Round a number with one or two decimal places to the nearest integer. |
| EQUIVALENCE   * Recognise and show, using diagrams, families of common equivalent fractions. * Recognise and write decimal equivalents of any number of tenths or hundredths. * Recognise and write decimal equivalents to 1/4; 1/2; 3/4. * Solve problems involving ratio (1 for every) and proportion (1 in every). |
| ADDITION & SUBTRACTION OF FRACTIONS   * Add and subtract fractions with the same denominator. |
| MULTIPLICATION & DIVISION OF DECIMALS   * Find the effect of dividinga one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths. |
| PROBLEM SOLVING   * Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number. * Solve simple measure and money problems involving fractions and decimals to two decimal places. |

**Position and Direction**

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| POSITION, DIRECTION & MOVEMENT   * Describe positions on a 2-D grid as coordinates in the first quadrant * Recognise positions, read and plot co-ordinates in the first quadrant. * Describe movements between positions as translations of a given unit to the left/right and up/down. * Recognise directions, and perpendicular and parallel lines. * Plot specified points and draw sides to complete a given polygon. |
| PATTERN   * Solve shape problems or puzzles. * Explain reasoning and methods. Make patterns from rotating shapes. * Recognise and explain patterns and relationships, generalise and predict. |

**Shape**

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| IDENTIFYING SHAPES & THEIR PROPERTIES   * Identify lines of symmetry in 2-D shapes presented in different orientations * Identify and recognise properties of rectangles. * Classify triangles: isosceles, equilateral, scalene, lines of symmetry. * Visualise 3-D shapes from 2-D drawings and identify nets of open cube. * Make and investigate a general statement about shapes. |
| DRAWING & CONSTRUCTING   * Complete a simple symmetric figure with respect to a specific line of symmetry * Recognise reflective symmetry in regular polygons. * Complete symmetrical patterns with two lines of symmetry at right angles. Reflect shapes in mirror parallel to one side. * Recognise where shape will be after translation. |
| COMPARING & CLASSIFYING   * Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. * Solve shape puzzles. Explain methods and reasoning orally and in writing. |
| ANGLES   * Identify acute and obtuse angles and compare and order angles up to two right angles by size. * Understand and use degrees. * Identify, estimate and order acute and obtuse angles. * Use protractor to measure and draw acute and obtuse angles to 5\*. * Calculate angles in a straight line. |

**Measurement**

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| MEASURING & CALCULATING   * Estimate, compare and calculate **different measures,** including **money in pounds and pence.** * Record estimates/ measurements from scales to suitable degree of accuracy.   **Length:**   * Measure and draw lines to the nearest mm. * Use, read and write standard metric units of length, abbreviations and relationships. Convert larger to smaller units of length. Know mile. * Suggest suitable units/equipment to estimate or measure length. * Measure and calculate the **perimeter** of a rectilinear figure (including squares) in centimetres and metres. * Understand, measure and calculate perimeter of rectangles, regular polygons. * Find the area of rectilinear shapes by counting squares. * Understand area measured in square centimetres. * Use formula in words for area of rectangle.   **Mass:**   * Use, read and write standard metric units of mass, abbreviations. Know relationships between them. Convert larger to smaller units of mass. * Suggest suitable units and equipment to estimate or measure mass.   **Capacity:**   * Use, read and write standard metric units of capacity, including abbreviations and pint, gallon. * Know and use relationships between them. * Convert larger to smaller units of capacity, including gallons to pints. * Suggest suitable units and equipment to estimate or measure capacity. |
| TELLING THE TIME   * Read, write and convert time between analogue and digital 12 and 24-hour clocks. * Read the time on 24-hour digital clock, e.g. 19:53. * Use timetables. * Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. |
| CONVERTING   * Convert between different units of measure (e.g. kilometre to metre; hour to minute). * Convert metres to centimetres and £ to pence, and vice versa. * Convert kg to g. * Read, write and convert time between analogue and digital 12 and 24-hour clocks. * Know and use relationship between units of time. |

**Statistics**

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| INTERPRETING, CONSTRUCTING & PRESENTING DATA   * Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. * Identify the mode. * Recognise when intermediate points have no meaning. * Represent and interpret data in a line graph. * Recognise when points can be joined to show trends. |
| SOLVING PROBLEMS   * Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. * Present and interpret data on a bar chart and bar line graph: axis in 2s, 5s, 10s, 20s, 100s. * Solve a problem by representing and interpreting data in bar line charts: axis in 2s, 5s, 10s, 20s, 100s. * Find the mode and calculate the range of a set of data. * Use a computer to compare different presentations of the same data. |