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| Maths | **Pedagogical Knowledge**  At Hartburn Primary School, lessons generally follow the format of a mental and oral starter, a main activity and a plenary session.  The teaching of maths at provides opportunities for:  • Group work  • Paired work  • Whole class teaching  • Individual work  Children engage in:  • The development of mental strategies  • Written methods  • Practical work  • Investigational work  • Problem-solving  • Mathematical discussion  • Consolidation of basic skills and routines  At Hartburn Primary School, we recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. The calculation policy is followed to ensure that pictorial, concrete and abstract strategies are used. We use the vocabulary scheme, when planning, to help ensure the appropriate vocabulary is used in our teaching and children are expected to use it in their verbal and written explanations. We endeavour to set work that is challenging, motivating and encourages the children to talk about what they have been doing. | | | | | | | | | | |
| Y1/2 | **Autumn**  **Childhood** | | | **Spring**  **Bright Lights, Big City** | | | | **Summer**  **Our Wonderful World** | | | |
| Local Heritage |  | | | | Money Sense Workshop | World Number Day | | |  | |  |
| Y1  Number | Within 10, Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.  Read and write numbers from 1 to 20 in numerals and words.  Place Value – Within 10, given a number, identify one more or one less.  Addition and Subtraction – Add and subtract one digit numbers to 10, including zero. | Place Value – Within 20, identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.  Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs.  Read and write numbers from 1 to 20 in numerals and words. | | | Subtraction – Recall all the number bonds to and within 10. And use these to reason with and calculate bonds to and within 20, recognising other associated additive relationships.  Place Value – Within 50, identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.  Addition and subtraction - Add and subtract one-digit and two-digit numbers to 20, including zero.  Count to and across 50, forwards and backwards, beginning with 0 or 1, or from any given number.  Count, read and write numbers to 50 in numerals; count in multiples of twos, fives and tens. |  | | | Multiplication and Division – Recall multiplication and division facts for 2 and 10 and use them to solve simple problems, demonstrating and understanding of the commutativity as necessary.  Fractions- Identify 1/2 and ¼ of a number or shape and know that all the parts must be equal parts of the whole. | | Place Value – Within 100, Partition two digit numbers into different combinations of tens and ones, explaining their thinking verbally, in pictures or using apparatus.  Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs. |
| Y1  Geometry |  | Shape – Recognise and name common 2 D and 3 D shapes.  . | | |  |  | | | Describe position, direction and movement, including whole, half, quarter and three-quarter turns | |  |
| Y1 Measure |  |  | | |  | Length and Height – Compare, describe and solve practical problems for: lengths and heights.  Weight and Volume – Compare, describe and solve practical problems for mass/weight:[for example, heavy/light, heavier than, lighter than]; capacity and volume [for example, full/empty, more than, less Fractions- Identify ¼ of a number or shape and know that all the parts must be equal parts of the whole. | | |  | | Money – Recognise and know the value of different denominations of coins and notes.  Time – Read the time on a clock (to half an hour).  Recognise and use language relating to dates, including days of the week, weeks, months and years.  Sequence events in chronological order using language (for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening). |
| Y2  Number | Read and write numbers to at least 100 in numerals and in words.  Place Value – Compare and order numbers from 0 up to 100; use and = signs. Use place value and number facts to solve problems.  Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward.  Addition and Subtraction – Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. | Multiplication and Division – Recall multiplication and division facts for 2, 5 and 10.   Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs. | | | Multiplication and Division – Use multiplication and division facts for 2, 5 and 10 to solve simple problems, demonstrating and understanding of commutativity as necessary. | Fractions – Identify ¼, 1/3, ½, 2/4, ¾ of a number or shape and know that all the parts must be equal parts of the whole.  Write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and ½. | | |  | | Recall multiplication and division facts for multiplication tables up to 12 × 12. |
| Y2  Geometry |  |  | | |  | Properties of Shape – Name, describe, compare and sort properties of 2D and 3D shapes, including number of sides, vertices, edges, faces and lines of symmetry. | | | Position and Direction – Use mathematical vocabulary to describe position, direction and movement including. | |  |
| Y2 Measure |  | Money – Use different coins to make the same amount. | | |  |  | | | Length and Height – Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass. | | Mass, Capacity and Temperature – Compare and order lengths, mass, volume/capacity and record the results using >, < and =.  Time – Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.  Know the number of minutes in an hour and the number of hours in a day.  Compare and sequence intervals of time. |
| Y2 Statistics |  |  | | | Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.  Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. |  | | |  | |  |
| Y3&4 | **Autumn**  **Through The Ages** | | | | **Spring**  **Rocks, Relics and Rumbles** | | | | **Summer**  **Emperors and Empires** | | |
| Local Heritage |  |  | | | Money Sense Workshop | World Number Day | | |  | |  |
| Y3 Number | Place Value - Recognise the place value of each digit in a three digit number (hundreds, tens, ones). Compare and order numbers up to 1000.  Read and write numbers up to 1000 in numerals and in words.  Add and subtract numbers mentally, including a three-digit number and hundreds.  Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number. | Addition - Add numbers with up to three digits, using formal written methods of columnar addition.  Subtraction - Subtract numbers with up to three digits, using formal written methods of columnar subtraction.  Multiplication and Division - Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. | | | Multiplication and Division - Write and calculate mathematical statements for multiplication and division using the multiplication tables they know, including for two digit numbers times one digit numbers, using mental and progressing to formal written methods. |  | | | Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.  Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.  Compare and order unit fractions, and fractions with the same denominators.  Recognise and show, using diagrams, equivalent fractions with small denominators.  Fractions - Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one digit numbers or quantities by 10.  Fractions - Add and subtract fractions with the same denominator within one whole [for example,⁵⁄₇ + ¹⁄₇ = ⁶ | |  |
| Y3 Geometry |  |  | | |  |  | | |  | | Recognise angles as a property of shape or a description of a turn.  Identify right angles, recognise that two right angles make a half turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle.  Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.  Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. |
| Y3 Measure |  |  | | | Money - Add and subtract amounts of money to give change, using both £ and p in practical contexts | Measurement: Length and Perimeter - Measure the perimeter of simple 2D shapes.  Measure, compare, add and subtract length. | | | Time - Estimate and read time with increasing accuracy to the nearest minute.  Know the number of seconds in a minute and the number of days in each month, year and leap year.  Compare the duration of events.  Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks. | | Mass and Capacity - Measure, compare, add and subtract: mass (kg/g); volume/capacity (l/ml). |
| Y3 Statistics |  |  | | | Solve one step and two step questions [for example, ‘How many more?’ and ‘How many fewer?’ using information presented in scaled bar charts and pictograms and tables. |  | | |  | |  |
| Y4  Number | Place Value -Order, compare and round (nearest 10,100 and 1000) numbers beyond 1000.  Place Value - Count backwards through zero to include negative numbers.  Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.  Addition and Subtraction - Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. | Recall multiplication and division facts for multiplication tables up to 12 × 12.  Place Value - Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. | | | Multiplication - Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.  Division - Recognise and use factor pairs and commutativity in mental calculations | Fractions - Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.  Fractions - Recognise and show, using diagrams, families of common equivalent fractions.  Fractions - Add and subtract fractions with the same denominator.  Fractions - 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.  Decimals - Recognise and write decimal equivalents of any number of tenths or hundredths.   Solve simple measure and money problems involving fractions and decimals to two decimal places. | | | Decimals - Compare numbers with the same number of decimal places up to two decimal places.  Decimals - Round decimals with one decimal place to the nearest whole number.  Fractions - Recognise and write decimal equivalents to 1/4, 1/2, 3/4. | | Recall multiplication and division facts for multiplication tables up to 12 × 12. |
| Y4  Geometry |  |  | | |  |  | | |  | | Identify acute and obtuse angles and compare and order angles up to two right angles by size.  Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.  Identify lines of symmetry in 2-D shapes presented in different orientations.  Complete a simple symmetric figure with respect to a specific line of symmetry. |
| Y4  Measure |  | Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. | | | Find the area of rectilinear shapes by counting squares. |  | | | Money - Estimate, compare and calculate different measures, including money in pounds and pence.  Time - Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.  Time - Read, write and convert time between analogue and digital 12- and 24-hour clocks. | |  |
| Y4 Statistics |  |  | | |  |  | | |  | | Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.  Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. |
| Y5&6  Cycle A | **Autumn**  **Dynamic Dynasties** | | | | **Spring**  **Sow Grow and Farm** | | | | **Summer**  **Ground-breaking Greeks** | | |
| Local Heritage |  | | STEM Workshop | | Money Sense Workshop | | World Number Day  Maths Quiz Club | |  |  | |
| Y5 Number | Place Value- Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.  Place Value - Read, write, order, compare and round numbers to at least 1 000 000 and determine the value of each digit.  Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.  Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.  Addition and Subtraction - Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). | | Multiplication and Division - Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.  Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.  Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) number.  Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3). | | Multiplication - 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.  Division - 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.  Fractions -  Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.  Fractions - Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (for example, 2/5 + 4/5 = 6/5 = 1 1/5).  Fractions - Compare and order fractions whose denominators are all multiples of the same number. | | Fractions - Add and subtract fractions with the same denominator and denominators that are multiples of the same number.  Fractions - Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.  Fractions - Solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.  Decimals - Read, write, order and compare numbers with up to three decimal places.  Decimals - Read and write decimal numbers as fractions (for example, 0.71 = 71/100).  Decimals - Round decimals with two decimal places to the nearest whole number and to one decimal place.  Percentages - Recognise the per cent symbol (%) and understand that per cent relates to ‘number of parts per hundred’, and write percentages as a fraction with denominator 100, and as a decimal. | | Decimals - Solve problems involving number up to three decimal places. |  | |
| Y5 Geometry |  | |  | |  | |  | | Identify angles at a point and one whole turn (total 360°). Identify angles at a point on a straight line and 1/2 a turn (total 180°).  Draw given angles, and measure them in degrees (°).  Use the properties of rectangles to deduce related facts and find missing lengths and angles.  Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. | Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.  Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. | |
| Y5 Measure |  | | Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.  Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes. | |  | |  | |  | Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre).  Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.  Estimate volume (for example, using 1 cm3 blocks to build cuboids (including cubes)) and capacity (for example, using water). | |
| Y5 Statistics | Complete, read and interpret information in tables, including timetables.  Solve comparison, sum and difference problems using information presented in a line graph. | |  | |  | |  | |  |  | |
| Y6 Number | Place Value -Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit  Place Value - Round any whole number to a required degree of accuracy.  Use negative numbers in context, and calculate intervals across zero.  Addition and Subtraction - Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.  Multiplication - Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.  Multiplication - Perform mental calculations, including with mixed operations and large numbers.  Division - Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.  Identify common factors, common multiples and prime numbers. | | Fractions - Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.  Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.  Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.  Multiply simple pairs of proper fractions, writing the answer in its simplest form (for example, ¼ x ½ = 1/8).  Divide proper fractions by whole numbers (for example, 1/3 ÷ 2 = 1/6). | | Multiplication - Multiply one-digit numbers with up to two decimal places by whole numbers.  Division - Use written division methods in cases where the answer has up to two decimal places.  Decimals - Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.  Associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375) for a simple fraction (for example, 3/8).  Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.  Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.  Generate and describe linear number sequences.  Use simple formulae.  Find pairs of numbers that satisfy an equation with two unknowns.  Express missing number problems algebraically.  Enumerate possibilities of combinations of two variables. | | Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.  Solve problems involving similar shapes where the scale factor is known or can be found.  Solve problems involving the calculation of percentages (for example, of measures, and such as 15% of 360) and the use of percentages for comparison. | |  |  | |
| Y6 Geometry |  | | Describe positions on the full coordinate grid (all four quadrants).  Draw and translate simple shapes on the coordinate plane, and reflect them in the axes. | |  | | Calculate the area of parallelograms and triangles.  Recognise that shapes with the same areas can have different perimeters and vice versa.  Recognise when it is possible to use formulae for area and volume of shapes.  Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units (for example, mm3 and km3). | |  | Draw 2-D shapes using given dimensions and angles.  Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.  Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.  Recognise, describe and build simple 3-D shapes, including making nets. | |
| Y6 Measure |  | |  | |  | | Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.   Convert between miles and kilometres. | |  |  | |
| Y6 Statistics |  | |  | |  | |  | | Interpret and construct pie charts and line graphs and use these to solve problems.  Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.  Calculate and interpret the mean as an average. |  | |