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| Stakesby Primary Academy Maths Skills Progression Matrix 2022-2023 4th September **- Version 2** | | | | | | |
| **Reception:** | **Number: Place Value** | **Number: Addition & Subtraction** | **Measurement:** | **Geometry:** | **Number: Multiplication & Division** |  | |
|  | **Numbers to five.**  **Comparing groups of objects.**  **Numbers to ten.**  **Numbers to twenty.** | **Sorting.**  **Change within 5.**  **Numbers to five.**  **Addition to ten.**  **Count back and on.** | **Awareness of time.** | **Shapes and space.**  **Exploring patterns.**  **Measurements (blocks).** | **Numerical patterns, identify and continue.** |
| **-** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | | |
| **Place Value: Counting** | **Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.**  **Count numbers to 100 in numeric form; count in multiples of 2’s, 5’s and 10’s.** | **Count in steps of 2, 3 and 5 from 0, and in 10’s from number, forward and backward.** | **Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.** | **Count in multiples of 6, 7, 9, 25 and 1,000.**  **Count backwards through zero to include negative numbers.** | **Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000.**  **Count forwards and backwards with positive and negative whole numbers, including through zero.** |  | | |
| **Place Value: Represent** | **Identify and represent number using objects and pictorial representations.**  **Read and write numbers to 100 in numeric form.**  **Read and write numbers from 1 to 20 in numeric form and written form.** | **Read and write numbers to at least 100 in numeric form and written form.**  **Identify, represent and estimate numbers using different representation, including the number line.** | **Identify, represent and estimate numbers using different representation.**  **Read and write number up to 1,000 in numeric and written form.** | **Identify, represent and estimate numbers using different representations.**  **Read Roman numerals up to 100 (I – C) and know that over time, the numeral system evolved to conclude the concept on zero and place value.** | **Read, write, order and compare numbers up to 1,000,000 and determine the value of each digit.**  **Read Roman numerals up to 1,000 (M) and recognise years written in Roman numerals.** | **Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.** | | |
| **Please Value: Use & Compare** | **Given a number, identify one more and one less.** | **Recognise the place value of each digit in a two-digit number (tens, ones).**  **Compare and order numbers from zero up to 100; use signs <, > and =.** | **Recognise the place value of each digit in a three-digit number (hundreds, tens and ones).**  **Compare and order number up to 1,000.** | **Find 1,000 more or less than a given number.**  **Recognise the palace value of each digit in a four-digit number (thousands, hundreds, tens, ones).**  **Order and compare numbers beyond 1,000.** | **Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit.** | **Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.** | | |
| **Place Value: Problems & Reasoning** |  | **Use place value and number facts to solve problems.** | **Solve number problems and practical problems involving these ideas.** | **Round any number to the nearest, 10, 100 or 1,000.**  **Solve number and practical problems that involve all of the above and with increasingly large positive numbers.** | **Interpret negative number in context.**  **Round any number up to 1,000,000 to the nearest, 10, 100, 1,000, 10,000 and 100,000.**  **Solve number problems and practical problem that involve all of the above.** | **Round any whole number to a required degree of accuracy.**  **Use negative numbers in context, and calculate intervals across zero.**  **Solve number and practical problems that involve all of the above.** | | |
| **Addition & Subtraction: Recall, Represent, Use** | **Read, write and interpret mathematical statements that involve addition, subtraction and equals signs (+ , - , +)**  **Represent and use number bonds and related subtraction facts within 20.** | **Recall and use addition and subtraction facts to 0 fluently, and derive and use related facts up to 100.**  **Show that addition of two numbers can be done in any order (commutative) but subtraction of one number from another cannot.**  **Recognise and use the inverse relationship between addition and use this to check calculations and solve missing number problems.** | **Estimate the answer to a calculation and use inverse operations to chuck the answer.** | **Estimate and use inverse operations to check answer to a calculation.** | **Use rounding to check answers to calculations and determine, in the context of a problem levels of accuracy.** |  | | |
| **Addition & Subtraction: Calculations** | **Add and subtract one-digit and two-digit numbers to 20, including zero.** | **Add and subtract numbers using concrete objects, pictorial representation and mentally including:**  **2-digit and ones, two-digit and tens, two two-digit numbers and adding three one-digit numbers.** | **Add and subtract number mentally including;**  **Three-digit and ones, three-digits and tens, a three-digit and hundreds.**  **Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.** | **Add and subtract numbers with up to 4-digits using the formal written method of columnar addition and subtraction – where appropriate.** | **Add and subtract whole number with more than 4-digits including the use of formal written methods – columnar addition and subtraction.**  **Add and subtract number mentally with increasingly large numbers.** | **Perform mental calculations, including with mixed operations and large numbers.**  **Use their knowledge of order of operations to carry out calculations involving the four operations.** | | |
| **Addition & Subtraction: Solve Problems** | **Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial support.**  **Investigate missing number problems such as 7 = \_ - 9 (variances).** | **Solve problem with addition and subtraction.**  **Using concrete objects and pictorial representations, including those involving number, quantities and measures.**  **Apply increasing knowledge of mental and written methods.** | **Solve problems including missing numbers, using number facts, place value and more complex addition and subtraction.** | **Solve addition and subtraction two-step problems in contexts, deciding which operation and methods to use and why.** | **Solve addition and subtraction multi-step problems in contexts deciding which operation and methods to use and justifying why.**  **Solve problems involving addition, subtraction, multiplication and division and a combination of these; including understands the meaning of the equals sign.** | **Solve addition and subtraction multi-step problems in contexts deciding which operations and methods to use and why.** | | |
| **Multiplication & Division: Recall, Represent, Use** |  | **Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognition of add and even numbers.**  **Show that multiplication of two numbers can be done in any order (commutative) but division of one number by another cannot.** | **Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.** | **Recall multiplication and division facts for multiplication tables, up to 12 x 12.**  **Use place value, known and derived facts to multiply and divide mentally, including multiplication by 0 and 1; multiplying three numbers together.**  **Recognise and use factors pairs and commutatively in mental calculations.** | **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) numbers.**  **Establish whether a number up to 100 is prime and recall prime numbers up to 19.**  **Recognise and use square numbers and cube numbers, and the notation for the squared (2) and cubed (3).** | **Identify common factors, common multiples and prime numbers.**  **Use estimation to check answers to calculations and determine, in the context of a problem an appropriate degree of accuracy.** | | |
| **Multiplication & Division: Calculations** |  | **Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication, division and equals sign.** | **Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.** | **Multiply two-digit and three-digit numbers by on-digit numbers using formal written layout.** | **Multiply number up to 4-digits by a one-digit or two-digit number using a formal written method, including long multiplication for two-digits numbers.**  **Multiply and divide numbers mentally drawing upon known facts.**  **Divide numbers up to 4-digits by one-digit numbers using formal written methods of short division and interpret remainders appropriately for the context.**  **Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000.** | **Multiply multi-digit numbers up to 4-digits by two-digits using formal written method of long multiplication.**  **Divide numbers up to 4-digits by a two-digit number using the formal written method of long division, and interpret remainders as whole number remainders, fractions or by rounding, as appropriate to the context.**  **Divide numbers up to 4-digit by a two-digit number using the formal written method of shirt division, where appropriate and interpreting remainders according to context.**  **Perform mental calculations, including with mixed operations and large numbers.** | | |
| **Multiplication & Division: Problem Solving** | **Solve one-step problem including multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.** | **Solve problem involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in context.** | **Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which an objects A are connect to B objects.** | **Solve problems involving multiplying and adding, including using the distribute law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as A objects are connected to B objects.** | **Solve problem involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.**  **Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.** | **Solve problems involving addition, subtraction, multiplication and division.** | | |
| **Multiplication & Division: Combined Operations** |  |  |  |  | **Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meanings of the equals sign.** | **Use their knowledge of the order of operations to carry out calculations involving the four operations.** | | |
| **Fractions: Recognise and Write** | **Recognise, find and name a half as one of two equal parts of an object, shape or quantity.**  **Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.** | **Recognise, find, name and write fractions: multiples of thirds, tenths and quarters of a shape, set of objects or quantity.** | **Count up and down in tenths; recognise that tenths arise from dividing an object in to 10 equal parts and in dividing one-digit numbers by 10.**  **Recognise, find and write fractions of a set of objects: unit fractions and non-unit fractions with small denominators.**  **Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.** | **Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.** | **Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.**  **Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements as mixed numbers.** |  | | |
| **Fractions: Compare** |  | **Recognise the equivalence of 2 quarters and 1 half.** | **Recognise and show, using diagrams, equivalent fractions with small denominators.**  **Compare and order unit fractions, and fractions with the same denominator.** | **Recognise and show, using diagrams, families and common equivalent fractions.** | **Compare and order fractions whose denominators are all multiples of the same number.** | **Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.**  **Compare and order fractions, including fractions >1** | | |
| **Fractions: Calculations** |  | **Write simple fractions for example 1 half of six = three.** | **Add and subtract fractions with the same denominator within one whole.** | **Add and subtract fractions with the same denominator.** | **Add and subtract fractions with the same denominator and denominators that are multiples of the same number.**  **Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.** | **Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.**  **Multiply simple pairs of proper fractions, writing the answer in its simplest form.**  **Divide proper fractions by whole numbers.** | | |
| **Fractions: Solve Problems** |  |  | **Solve problems that involve all of the above (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** |  |  |  | **Recognise and write decimal equivalents of any number of tenths or hundredths.**  **Recognise and write decimal equivalents to quarters and halves.** | **Read and write decimal numbers as fractions.**  **Recognise and use thousands and relate them to tenths, hundredths and decimal equivalents.** | **Identify the value of each digit in numbers given to three decimal places.** | | |
| **Decimals: Compare** |  |  |  | **Round decimals with one decimal place to the nearest whole number.**  **Compare numbers with the same number of decimal places up to two decimal places.** | **Round decimals with two decimal places to the nearest whole number and to one decimal place.**  **Read, write, order and compare numbers with up to three decimal places.** |  | | |
| **Decimals: Calculations & Problems** |  |  |  | **Find the effect of dividing a one- or two-digit number y 10 and 100, identifying the value of digits in the answer as ones, tenths and hundredths.** | **Solve problems involving numbers up to three decimal places.** | **Multiply and divide numbers by 10, 100 and 1,000 giving answers up to three decimal places.**  **Multiply on-digit numbers with up to two decimal places by whole numbers.**  **Use written division methods in cases where the answer ha up to two decimal places.**  **Solve problems which require answers to be rounded to specified degrees of accuracy.** | | |
| **Fractions, Decimals & Percentages:** |  |  |  | **Solve simple measure and money problems involving fractions and decimals to two decimal places.** | **Recognise the percent symbol (%) and understand that percent relates to the number of parts per hundred and write percentages as a fraction with denominator of 100 and as a decimal.**  **Solve problems which require knowing percentage and decimal equivalents.** | **Associate a fraction with division and calculate fraction equivalents.**  **Recall and use equivalences between simple fractions, decimals and percentages in different contexts.** | | |
| **Ratio & proportion:** |  |  |  |  |  | **Solve problems involving the relative sizes of to quantities where missing values can be found using integer multiplication and division facts.**  **Solve problems involving the calculation of percentages.**  **Solve problems involving similar shapes where the scale factor is known or can be found.**  **Solve problems involving unequal sharing and grouping using knowledge of fraction and multiples.** | | |
| **Algebra:**  **\*\**Although algebraic notation is not introduced until Y6, algebraic thinking must start much earlier as shown in Y1, 2 and 3 objectives.*** | ***Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations and missing number problems such as 7 = \_ - 9.*** | ***Recognise and use the inverse relationship between addition and subtraction and use that to check calculations and solve missing number problems.*** | ***Solve problems, including missing number problems.*** |  |  | **Use simple formulate.**  **Generate and escribe linear number sequences.**  **Express missing number problems algebraically.**  **Find pairs of numbers that satisfy and equation with two unknowns.**  **Enumerate possibilities of combinations of variables.** | | |
| **Measurement: Using Measures** | **Compare, describe and solve practical problems for:**  **Lengths and heights, mass and weight, capacity and volume, time.**  **Measure and begin to record the following;**  **Lengths and heights, mass and weight, capacity and volume and time (hours, minutes and seconds).** | **Choose and use appropriate standard units to estimate and measure.**  **Compare and order lengths, mass, volume, capacity and record results using <, > and =.** | **Measure, compare, add and subtract; lengths, mass and volume.** | **Convert between different units of measure.**  **Estimate, compare and calculate different measures.** | **Convert between different units of measure.**  **Understand and use approximate and equivalences between metric units and common imperial units.**  **Use all four operations to solve problems involving measure.** | **Solve problems involving calculation and conversation of units of measure, using decimal notation up to three decimal places.**  **Use, read, write and convert between standard units.**  **Convert between miles and kilometres.** | | |
| **Measurement: Money** | **Recognise and know the value of different denominations of coins and notes.** | **Recognise and use symbols for pounds (£) and Pence (p); combine amounts to make a particular value.**  **Find different combinations of coins that equal a given amount.**  **Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.** | **Add and subtract amounts of money to give change, using both £ and p in practical contexts.** | **Estimate, compare and calculate different measures, including money in pounds and pence.** | **Use all four operations to solve problems involving measure.** |  | | |
| **Measurement: Time** | **Sequence events in chronological order using appropriate language.**  **Recognise and use language relating to dates, including days of the week, weeks and months and years.**  **Tell the time to the hour and half past to the hour, draw the hands of clock face to show these times.** | **Compare and sequence intervals of time.**  **Tell time and record to within 5 minutes, including quarter past/to the hour and draw the hands on the flock face to show these times.**  **Know the number of minutes in an hour and the number of hours in a day.** | **Tell the time from an analogue clock, including using romans numerals.**  **Tell the time using a 12-hour and 24-hour format.**  **Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of second, minutes and hours; use vocabulary such as o’clock, A.M./P.M. and noon / midnight.**  **Know the number of seconds in a minute and the number of days in each month, year and leap year.**  **Compare durations of events.** | **Read, write and convert time between analogue and digital 12- and 24hour clocks.**  **Solve problems involving converting from hours to minutes; minutes to seconds; years to months and weeks to days.** | **Solve problems involving converting between units of time.** | **Use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a large unit, and vice versa.** | | |
| **Measurement: Perimeter, Area, Volume** |  |  | **Measure the perimeter of 2-D shapes.** | **Measure and calculate the perimeter of a rectilinear figure in CM and M.**  **Find the area of rectilinear shapes by counting squares.** | **Measure and calculate the perimeter of composite rectilinear shapes in CM and M.**  **Calculate and compare the areas of rectangles and including using standards units.**  **Estimate the area of irregular shapes.**  **Estimate volume and capacity using blocks 1cm2** | **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 the area of parallelograms and triangles.**  **Calculate, estimate and compare volume of cubes and cuboids using standard units.** | | |
| **Geometry: 2-D Shapes** | **Recognise and name common 2-D shapes.** | **Identify and describe the properties of 2-D shapes, including the number of sides and lines of symmetry.**  **Identify 2-D shapes on the surface of 3-D shapes.**  **Compare and sort common 2-D shapes and everyday objects.** | **Accurately draw 2-D shapes.** | **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.** | **Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.**  **Use the properties of rectangles to deduce related facts and find missing lengths and angles.** | **Draw 2-D shapes using given dimensions and angles.**  **Compare and classify geometric shapes based on their properties and sizes.**  **Illustrate and name parts of circles including radius, diameter and circumference and know that the diameter is twice the radius** | | |
| **Geometry: 3-D Shapes** | **Recognise and name common 3-D shapes.** | **Recognise and name common 3-D shapes.**  **Compare and sort common 3-D shapes and everyday objects.** | **Make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.** |  | **Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.** | **Recognise, describe and build simple 3-D shapes, including making nets.** | | |
| **Geometry: Angles & Lines** |  |  | **Recognise angle as a property of shape or a description of a turn.**  **Identify right angles, recognise two right angles make a half turn, three make 3-quarters 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.** | **Identify acute and obtuse angles and compare and order angles up to two right angles by size.**  **Identify lines of symmetry in 2-D shapes presented in different orientations.**  **Complete a simple symmetric figure with respect to a specified line of symmetry.** | **Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles.**  **Draw given angles, and measure them in degrees.**  **Identify angles at a point and one whole turn, angles at a point on. A straight line and other multiples of 90.** | **Find unknown angles in any triangle, quadrilaterals and regular polygon.**  **Recognise angles where they meet at a point, are on. A straight line, or are vertically opposite, and find missing angles.** | | |
| **Geometry: Position & Direction** | **Describe position, direction and movement, including whole, half, quarter and three-quarter turns.** | **Order and orange combinations of mathematical objects in patterns and sequences.**  **Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn in terms of right angles for quarter, half and three-quarter turns.** |  | **Describe positions on a 2-D grid as coordinates in the first quadrant.**  **Describe movements between positions as translations of a given unit to the left, right, up or down.**  **Plot specified points and draw sides to complete a given polygon.** | **Identify, describe and represent the position of s shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.** | **Describe positions on the full coordinate grid (all four quadrants).**  **Draw and translate simple shapes on the coordinate plane, and reflect them in the axis.** | | |
| **Statistics: Present & Interpret** |  | **Interpret and construct simple pictograms, tally charts and block diagrams and simple tables.** | **Interpret and present data using bar charts, pictograms and tables.** | **Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.** | **Complete, read and interpret information in tables, including timetables.** | **Interpret and construct pie charts and line graphs and use these to solve problems.** | | |
| **Statistics: Solve Problems** |  | **Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.**  **Ask and answer questions about totalling and comparing categorical data.** | **Solve one-step and two-step questions using information presented in scaled bar charts, pictograms and tables.** | **Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.** | **Solve comparison, sum and difference problems using information presented in a line graph.** | **Calculate and interpret the mean as an average.** | | |