

Hampshire Medium Term Plans for Mathematics: Block D (for use with mixed age classes).

| Term | Wk1 | Wk2 | Wk3 | Wk4 | Wk5 | Wk6 | Half Term | Wk7 | Wk8 | Wk9 | Wk10 | Wk11 | Wk12 | End of Term | |
|--------|-----|-----|-----|--------------|-----|-----|-----------|-----|-----|-----|------|------|------|-------------|----|
| Autumn | A1 | | | B1 | | | | M1 | C1 | | | D1 | | | |
| Spring | A2 | | | B2 | | | | M2 | C2 | | | D2 | | | M3 |
| Summer | A3 | | | B3 | | | | | C3 | | | D3 | | | M4 |
| | | | | SATs (Y2/Y6) | | | | | | | | | | | |

| Content common to all blocks | Block A | Block B | Block C | Block D |
|---|---|--|---|--|
| Fluency (Place value and a sense of number) Problem solving Reasoning | Addition and subtraction (for whole and part numbers) Geometry and Measure | Multiplication and division (for whole and part numbers) Statistics and Measure | Addition and subtraction (for whole and part numbers) Geometry and Measure | Multiplication and division (for whole and part numbers) Statistics and Measure |

Key:

- **A (B, C, D) 1 (2, 3):** Block A (B, C, D): Term 1 (2, 3)
- **M1 (2, 3):** Assessment milestone 1 (2, 3)
- **M4:** Assessment milestone 4: Transition to next year group ~ could be End of Year Key Performance Indicators, summative or formative assessments, transition conversations with attainment evidence.

Blocks are laid out across year groups to enable schools to combine two (or three) year groups when planning for mixed age classes (vertical year groups)

There is one document for each of the four blocks.

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| D1 (Autumn Term) | | | | |
|------------------|---|--|--|---|
| Year | Place Value and a Sense of Number | Problem Solving and Reasoning | Core Calculation (four rules for whole and part numbers) | Geometry and Measure |
| 1 | Count in multiples of twos | Solve one step problems involving multiplication and division using concrete and pictorial representations Solve practical problems involving mass / weight | <u>Multiplication and Division</u> Represent multiples of twos and tens in a range of ways, including patterning, counting and grouping. Begin to develop strategies to double and halve quantities (even amounts) <u>Fractions</u> Recognise, find and name a quarter as one of four equal parts of an object, shapes or quantity. | Compare and describe mass/weight (heavier/lighter) Compare and describe time in minutes (quicker/slower/ earlier/later) |
| 2 | Count in steps of 5 from 0 forward and backward Read and write numbers to at least 100 in numerals and words | Solve problems involving multiplication and division using materials, arrays and repeated addition, including in the context of money | <u>Multiplication and Division</u> Recall and use multiplication and division facts for the 5x table. Calculate and record multiplication statements using x and = signs (demonstrating understanding using an array, concrete or pictorial) | <u>Measure</u> Recognise and use symbols for £ and p Combine amounts to make a particular value |
| 3 | Count from 0 in multiples of 4 | Solve problems involving multiples of 2,3,4,5,10 in practical contexts linked with measure | <u>Multiplication and Division</u> Recall and use multiplication and division facts for the 3x and 4x tables Multiply and divide one digit numbers by 10 using PV reasoning. <u>Fractions</u> Recognise and use fractions as numbers (i.e. they have a value and a place on the number line) Recognise that tenths arise from dividing an object into 10 equal parts (bar model) . Compare and order unit fractions (use a number line or other diagram) | <u>Measure</u> Measure and compare lengths in m, cm and mm Begin to estimate simple measure , such as the height of a doorframe is approximately 2m. Measure the perimeter of simple 2D shapes <u>Geometry</u> Draw simple 2D shapes (quadrilaterals with a right angles, triangles with right angles), given the measurements of side lengths. Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. |
| 4 | Count in multiples of 6 Round any number to the | Solve simple measure and money problems involving fractions | <u>Multiplication and Division</u> Recall and use multiplication and division facts for, | <u>Measure</u> Estimate, compare and calculate with mass |

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| | nearest 10, 100 or 1000 | | <p>2x, 3x, 4x, 5x, 6x, 8x</p> <p><u>Fractions</u> Recognise that hundredths arise when dividing a quantity by 100 and dividing tenths by 10. Find the effect of dividing a one-or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.</p> | <p>in kg / g Convert between kg and g</p> |
| 5 | <p>Round numbers to the nearest power of 10 to estimate calculations</p> <p>Partition numbers to support multiplication and division (the distributive law: $36 \times 5 = (30 \times 5) + (6 \times 5)$)</p> | Solve problems to develop the use of heuristics: focus on patterning. | <p><u>Multiplication and Division</u> Establish prime numbers to 50. Know that non-prime numbers are called composite numbers. Recognise and use square numbers with notation (n^2). Use arrays to show which numbers are square and which are not (25 can be drawn as a 5x5 square, 26 cannot)</p> <p><u>Fractions</u> Add and subtract fractions with denominators being multiples of the same number.</p> | <p><u>Measure</u> Use four operations, decimal notation and scaling to solve problems involving mass.</p> <p><u>Statistics</u> Solve comparison, sum and difference problems using information presented in a line graph (continuous data)</p> |
| 6 | Secure multiplication and division facts. Be able to generate 'new for old' using a range of jottings and representations and an understanding of PV | <p>Problem solving heuristics: Develop finding all possibilities through being systematic. Use of tables and lists to organise information.</p> | <p>Identify the common factors or common multiples of up to three numbers. Recognise prime numbers to 100. (know up to 20)</p> <p><u>Fractions</u> Multiply and divide with simple fractions (use arrays)</p> <p><u>Algebra</u> Enumerate all possibilities of combinations in two variables (e.g. find pairs of numbers with a product of 7)</p> | <p><u>Geometry</u> Compare and classify geometric shapes Find unknown angles by calculation.</p> <p><u>Statistics</u> Interpret and construct line graphs</p> |

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| D2 (Spring Term) | | | | |
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| Year | Place Value and a Sense of Number | Problem Solving and Reasoning | Core Calculation (four rules for whole and part numbers) | Geometry and Measure |
| 1 | Count in multiples of twos, fives and tens | Solve problems involving doubling and halving Solve problems involving a quarter | <u>Multiplication and Division</u> Use multiples of ten to derive multiples of five, using concrete objects, arrays and bar models to support visualisation Understand that a group of five objects can be treated as one unit of five (the idea of multiples) <u>Fractions</u> Recognise, find and name a half and a quarter as one of two, or four, equal parts of an object, shapes or quantity. Develop the idea of part-whole (fractions show a relationship between equal parts of a whole) Represent using bars independently | <u>Measure</u> Measure and record lengths and heights using non- standard units Compare and describe time on hours, minutes and seconds. |
| 2 | Count in steps of 3 from zero, forwards or backward. | Solve multiplicative problems in practical contexts such as recipes (doubling, halving, five times as many, shared into three) | <u>Multiplication and Division</u> Calculate division problems using known multiplication facts and an array. Record using ÷ sign. Use an array and groups of objects to show that multiplication of two numbers is commutative but division is not <u>Fractions</u> calculate simple fractions of amounts such as $\frac{1}{2}$ of 6 = 3 by using concrete sharing and pictorial representations | <u>Measure</u> Choose and use appropriate standard units to estimate and measure mass (kg/g); temperature (°C); capacity (l/ml), using scales, thermometers and measuring vessels ~ perhaps when cooking <u>Statistics</u> Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. Answer questions about totals and comparison of discrete data. |
| 3 | Count on from 0 in multiples of 50 and 100 | Use know multiplication and division facts to solve problems in context and to derive new facts for old (If I know that $3 \times 4 = 12$; then I know that $6 \times 4 = 24$ ~ using an array to explain why). | <u>Multiplication and Division</u> Recall and use facts for the 4x and 8x tables (x and ÷) Write and calculate mathematical statements for multiplication and division including for two-digit numbers times on-digit numbers <u>Fractions</u> | <u>Measure</u> Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks Estimate and read time with increasing accuracy to the nearest minute Record and compare time in terms of |

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| | | | <p>Recognise and write fractions of a discrete set of objects, unit and non-unit fractions with small denominators (i.e. small groups of counting objects)</p> <p>Add and subtract fractions with the same denominator within one whole. Use a bar model (e.g. $\frac{1}{6} + \frac{2}{6} = \frac{3}{6}$ and $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$)</p> | <p>seconds, minutes, hours and o'clock.</p> <p>Compare the duration of events such as the time taken to complete a particular task.</p> |
| 4 | <p>Order and compare numbers beyond 1000</p> <p>Identify 1, 10, 100 more and less to support efficient calculation.</p> <p>Count up and down in hundredths.</p> <p>Recognise and write decimal equivalents of any number of tenths or hundredths</p> | <p>Solve contextual integer scaling problems, such as four times as high.</p> <p>Solve contextual correspondence problems, such as 3 hats and 4 coats ~ how many different outfits?</p> | <p><u>Multiplication and Division</u></p> <p>Know or quickly derive multiplication and division facts up to 12x12 (arrays, repeated addition, partitioning)</p> <p>Use factor pairs in mental calculations and partitioning (the distributive law) to multiply up to 2-digit by 1-digit numbers</p> <p>Develop a reliable written method for multiplication of 2-digit or 3-digit by 1-digit numbers.</p> <p><u>Fractions</u></p> <p>Recognise and write decimal equivalents to $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{3}{4}$</p> <p>Compare numbers with the same number of decimal places up to two dps</p> | <p><u>Measure</u></p> <p>Convert between hours and minutes; minutes to seconds; years to months; weeks to days.</p> |
| 5 | <p>Increase fluency by using patterning and building from known facts.</p> <p>e.g. $0.02 \times 0.1 = ?$</p> <p>$2 \times 1 = 2$</p> <p>$0.2 \times 1 = 0.2$</p> <p>$0.02 \times 1 = 0.02$</p> <p>$0.02 \times 0.1 = 0.002$</p> <p>Read, write, order and compare numbers with up to three decimal places.</p> | <p>Solve problems using multiplicative reasoning and questioning: What is the same and what is different? What if I change...?</p> | <p><u>Multiplication and Division</u></p> <p>Establish if a number is prime up to 100 (use the 100 square and eliminate all multiples (sieve of Eratosthenes))</p> <p>Secure more formal written methods for multiplication and division, with appropriate models and images to support.</p> <p>Interpret remainders in context.</p> <p>Recognise square and cube numbers. Use correct notation (n^2, n^3)</p> <p><u>Fractions</u></p> <p>Multiply proper fractions and mixed numbers by</p> | <p><u>Measure</u></p> <p>Estimate volume (using cm^3 blocks to construct cubes and cuboids) and capacity (using liquids and different containers ~ milk containers are good as you can get 1, 2 and 4 litres easily)</p> |

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| | Multiply and divide any number by 10,100 and 1000. | | whole numbers, using materials and diagrams to support understanding of structure and reasoning Solve problems that require knowing % and decimals equivalents, including fractions with a denominator of 10 or 25 | |
| 6 | Embed the use of the inverse to check an answer. (bar model) Estimate through rounding to an appropriate degree of accuracy before calculating | Problem solving heuristics: Develop finding all possibilities through being systematic. Use of tables and lists to organise information. | <u>Fractions</u> Use written division methods in cases where the answer has up to two decimal places Recall and use equivalences between fractions, decimals and percentages <u>Algebra</u> Enumerate all possibilities of combinations in two variables (e.g. find pairs of numbers with a product of 7) | <u>Measure</u> Solve problems involving calculation with units of measure and conversion between related units up to 3dps |

| D3 (Summer Term) | | | | |
|------------------|---|---|--|--|
| Year | Place Value and a Sense of Number | Problem Solving and Reasoning | Core Calculation (four rules for whole and part numbers) | Geometry and Measure |
| 1 | Independently read, write and say numbers from 1 to 20 (to 100, with support) in numerals and words Construct models and images to show an emerging understanding of the multiples of 2s,5s and 10s (e.g.arrays) | Be able to independently use manipulatives and pictorial representations to show how to find the solution to multiplication and division problems in context. | <u>Multiplication and Division</u> Solve one step multiplication and division problems in context, calculating the answer using concrete and pictorial representations including supported arrays <u>Fractions</u> Begin to explore representations for one, two, three and four quarters (objects and shapes with lines of symmetry) | <u>Measure</u> Compare, describe and record mass/ weight; capacity and volume. Use simple recipes and cooking. Link this with the measurement of time when cooking. |
| 2 | Doubling and halving. Using steps of 2 to see steps of 4 | Reasoning problems such as 'spot the mistake' with counting on or back in regular steps eg. | <u>Multiplication and Division</u> Explore the similarities and difference between sharing and grouping. | <u>Measure</u> You have 50p in your purse. How many coins could you have, what could they be? |

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| | | 45,40,35,25 and 'True or false' such as I start at 3 and count in 3s. I will say 13. | Use counting in 2s to identify odds (1,3,5...) and evens (2,4,6...) <u>Fractions</u> Count in fractions up to 10 using a number line ~ use the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence to help. | (heuristic: being systematic, listing all possibilities) <u>Statistics</u> Count and categorise small collections of items (e.g. counters or smarties). Ask and answer questions about the data and compare with another child's data. |
| 3 | Connect tenths to place value, decimal measures and to division by 10 Begin to see that decimal fractions are linked to proper fractions (such as $\frac{1}{2} = 0.5$ and $\frac{1}{10} = 0.1$) | Solve problems involving missing numbers and reasoning. If $3 \times 7 = 21$; then $3 \times ? = 28$ Use arrays to explain why | <u>Multiplication and Division</u> Begin to progress towards formal written methods using the times tables that are secure. <u>Fractions</u> Generate equivalent fractions, using diagrams to compare and explain why they are the same. Begin to link to multiples. | <u>Statistics</u> Carry out a simple statistics project such as tallying the number of different fish in a big tank (A3 picture), creating a pictogram and a bar chart with different scales (such as 2, 5, 10). Work together to solve problems about the data, such as how much would it cost to buy all the fish in the smallest group? Produce a poster to show their data, charts, questions and conclusions. |
| 4 | Count backwards through zero to include negative numbers. | Solve a contextual problem that requires all four operations and fractions (perhaps a budget for an end of term party, or a summer holiday, or a recipe (and cost) for a party drink for 5, 10, 100 children) | <u>Multiplication and Division</u> Develop formal methods of short multiplication and short division with appropriate models and images alongside <u>Fractions</u> Independently identify equivalent fractions using the multiplicative relationship between the numerator and the denominator (e.g. in quarters, the denominator is always four times the numerator) | <u>Measure</u> Use measuring instruments accurately, making connections between measure and number (e.g. recipes, mixing fruit cocktails, the perimeter of the playground...) |
| 5 | Recognise and describe the term-to-term rule of linear sequences using patterning for support. Include fractions and negative numbers as appropriate. | Solve problems using mathematical reasoning and questioning. Ensure that pupils can offer solutions with a wide range of representations, including concrete and pictorial to demonstrate an understanding | <u>Multiplication and Division</u> Continue to develop formal methods for multiplication and division. Solve multi-step problems in a range of contexts, with rounding for estimation. <u>Fractions</u> Link fractions to division. See that division by 2 is | <u>Measure</u> Measure, compare and convert between units of mass and capacity (g, kg, l and ml) using knowledge of PV and reasoning. Practical contexts needed here. <u>Statistics</u> Draw, compare and interpret simple pie |

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| | e.g. 7, 4, 1, -2, -5 (term to term rule: subtract 3) | of structure. | the same as halving the group etc. Be able to convert between common fractions, decimals and percentages using place value understanding and % as parts per hundred. Solve simple problems which include all three representations of part-whole to encourage pupils to shift easily between them. | charts where the sectors are multiples of 90°. Reason that this represents one quarter of the data. |
| 6 | Multiplicative facts and related facts | <u>Problem solving strategies</u> Solve a wide range of problems in different contexts and with a variety of numbers and operations. <ul style="list-style-type: none"> • Patterning (what is the same and what is different) • Find all possibilities (make a list or use a table) • Work systematically • Trial and Improvement • Start with a simpler example • Draw a diagram Use equipment (can you say it, make it, draw it, write it, explain it?) | <u>Calculation</u> Secure and be fluent with formal methods alongside visual and concrete models and images. Extend calculation to negative numbers, using reasoning and the number line for support. Calculate with numbers and in context. <u>Algebra</u> Solve missing number problems and use simple formulae. Begin to reason and generalise the arithmetic when solutions are found. | <u>Geometry</u> Rotations, reflections and translations Using an angle measurer and reasoning about angles |

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UNIT PLANNING MODEL

| Week | Date | Block | Unit | Big ideas, unit objectives, hot and cold tasks with key activities, resources, models and images. (now construct the connected learning journey – link to previous learning) |
|-------------------|----------|-------|-----------------------------|---|
| 1 | 04-09-17 | A1 | Geometry | |
| 2 | 11-09-17 | A1 | Addition and Subtraction | |
| 3 | 18-09-17 | A1 | Addition and Subtraction | |
| 4 | 25-09-17 | A1 | Statistics and Measure | |
| 5 | 02-10-17 | B1 | Measure | |
| 6 | 09-10-17 | B1 | Multiplication and Division | |
| 7 | 16-10-17 | B1 | Division and Fractions | |
| Milestone 1 | | | | |
| Half Term | | | | |
| 8 | 30-10-17 | C1 | Geometry | |
| 9 | 06-11-17 | C1 | Addition and Subtraction | |
| 10 | 13-11-17 | C1 | Addition and Subtraction | |
| 11 | 20-11-17 | D1 | Statistics and Measure | |
| 12 | 27-11-17 | D1 | Fractions | |
| 13 | 04-12-17 | D1 | Multiplication and Division | |
| 14 | 11-12-17 | D1 | Multiplication and Division | |
| Christmas Holiday | | | | |

Identify key tasks ~ plan the journey ~ choose the 'cold task' ~ design the 'hot task'

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