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 The logo for 'Mult e Maths' features the word 'Mult' on the left, a stylized 'e' inside a circular graphic in the center, and the word 'Maths' on the right. The entire logo is set against a grey rectangular background.

KS2 Solving Problems Teacher's Notes

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Introduction

All activities in the Mult-e-Maths Strand CD-ROMs are accompanied by teacher's notes, which are included on the CD-ROMs as PDFs. This pre-printed pack is designed to save you printing time, providing a ready-to-use resource that you can file in a ring-binder alongside your maths planning.

The pack consists of four parts, one for each of Years 3, 4, 5 and 6. In each part there are:

- a list of contents, including the titles of the on-screen activities and brief descriptions of them;
- a planning grid linking activities to objectives in the National Numeracy Strategy *Framework for teaching mathematics* (see below for further details);
- teacher's notes for starters and then lessons (see overleaf for further details).

Planning

The **planning grids** included in this pack are designed to help you to incorporate the Mult-e-Maths Strands into your planning.

The left-hand column of each grid shows NNS *Framework* objectives for the appropriate strand and year. They appear in the same order as in the *Framework*.

The right-hand column shows the starter and lesson activities that match each objective. (Lessons are shaded to enable you to distinguish between starters and lessons more easily.)

Note: The grids show the main learning objective for each activity, whereas the teacher's notes also detail any linked objectives.

The Mult-e-Maths Strands do not cover all of the NNS *Framework* objectives, but are designed to support other methods of effective teaching, including practical and pencil and paper work.

Medium term plans can be downloaded from the Mult-e-Maths website. These show how each Mult-e-Maths Strand activity can be mapped into your termly planning. They are provided in Microsoft Word ® format to enable you to adapt them to your own school plans.

Clicking on the Mult-e-Maths icon on any screen of a Mult-e-Maths Strand will take you directly to the website at:



www.cambridge-hitachi.com/multemaths/

The medium term plans can be accessed from the 'Ideas and inspiration' section.

Mult-e-Maths and the National Numeracy Strategy Framework – Addition and Subtraction Year 3 Planning grid

Year 3 Framework objectives (continued)	Mult-e-Maths Starters and Lessons (continued)
(p33) Add by partitioning into tens and units, then recombining	AS356 Partitioning Finding the answers to additions where partitioning into tens and units might be a useful strategy AS353 Using tens and units Adding pairs of 2-digit numbers by partitioning into tens and units AS3L3 Partitioning and addition Partitioning numbers into tens and units to help with addition AS3L6 Adding larger numbers Adding larger numbers by splitting them into their place value parts and with the aid of jottings
(p33) Find a small difference by counting up from the smaller to the larger number	AS3512 Counting up Solving subtractions by counting up AS3L3 Small differences Using counting up from the smaller number to solve subtractions and deciding when this method is most appropriate AS3L10 Changing the order Finding the missing number in addition problems by changing the order of the numbers
(p33) Identify near doubles, using doubles already known	AS3521 Near doubles Using known doubles to solve near doubles AS3L12 Near doubles Using near doubles when adding
(p35) Add and subtract mentally a 'near multiple of 10' to or from a 2-digit number, by adding or subtracting 10, 20, 30... and adjusting	AS3519 Adding and adjusting Adding 0, 10, 20... to 2-digit numbers AS3520 Subtracting and adjusting Subtracting 0, 10, 20... from 2-digit numbers AS3L8 Using near multiples of 10 Adding and subtracting mentally using near multiples of 10 and adjusting
(p35) Use patterns of similar calculations	AS358 Using patterns Spotting inconsistencies in patterns of calculations and using the patterns to find the answers to other calculations AS3L14 Similar calculations Identifying patterns of similar calculations and using them to solve other additions and subtractions
(p35) Say or write a subtraction statement corresponding to a given addition statement, and vice versa	AS353 Matching additions and subtractions Using knowledge of number facts to 20 to make additions and matching subtractions AS3L6 Number facts to 20 Finding pairs of numbers with a given total up to 20 and identifying corresponding subtraction facts
(p37, 38) Use known number facts and place value to add/subtract mentally	AS3522 Add and subtract mentally Adding and subtracting mentally without crossing the tens boundary AS3524 Using known number facts Finding the missing numbers in additions and subtractions and using one number fact to solve other additions and subtractions AS3L10 Number facts and place value Using known number facts and place value to help mental calculation

Planning grid for Addition and Subtraction Year 3

Year 3 sample plan: Autumn term, part 1

Unit	Days	Pages	Topic	Objectives: children will be taught to ...	Mult-e-Maths starter reference	Mult-e-Maths lesson reference
1	3	8-19	Place value, ordering, estimating, rounding	Read and write whole numbers to 1000 in figures and words. Know what each digit represents, and partition 2-digit numbers into a multiple of 10, a multiple of 10, and ones. Read and begin to write the vocabulary of estimation. Estimate up to 100 objects.	NS354 NS352 NS353 NS351	NS3L2 NS3L3
		76-77	Reading numbers from scales	Read scales to the nearest division.	SS3513	NS3L1
2-3	10	24-29	Understanding + and -	Extend understanding of the operations of addition and subtraction. Read and begin to write related vocabulary. Use +, = and = signs. Recognise that addition can be done in any order.		
		66-69	Money and 'real life' problems	Recognise all coins and notes. Understand £p notation (e.g. £3.06). Find totals, give change and work out how to pay.		
		33-41	Mental calculation strategies (+ and -)	Put the larger number first to count on. Identify near doubles. Bridge through a multiple of 10 and adjust.	AS3511 AS3521 AS3517 AS3516 AS3523	AS3L15 SP3L6 AS3L13 AS3L12 AS3L7
4-6	13	58-61	Making decisions, checking results	Choose appropriate number operations and calculation methods to solve word problems. Explain and record methods informally. Check sums by adding in different order.		SP3L1
		13	Place value, ordering, estimating, rounding	Say the number that is 1, 10 or 100 more, or less, than any given 2- or 3-digit number. Read time to 5 minutes. Read and begin to write the vocabulary related to length. Use a ruler to draw and measure lines to the nearest half cm. Read scales to the nearest division. Use decimal notation for m and cm. Measure and compare using m and cm. Know the relationships between m and cm, km and m. Suggest suitable units and equipment to estimate or measure lengths, including km. Round to nearest whole/half unit, or to mixed units (e.g. 3m 20cm). Choose an appropriate number operation and calculation method to solve word problems. Explain and record methods informally.	NS352 NS3511	NS3L4
7	2	70-77	Measures, including problems	Read time to 5 minutes. Read and begin to write the vocabulary related to length. Use a ruler to draw and measure lines to the nearest half cm. Read scales to the nearest division. Use decimal notation for m and cm. Measure and compare using m and cm. Know the relationships between m and cm, km and m. Suggest suitable units and equipment to estimate or measure lengths, including km. Round to nearest whole/half unit, or to mixed units (e.g. 3m 20cm). Choose an appropriate number operation and calculation method to solve word problems. Explain and record methods informally.	SS359	SS3L6 SS3L7
		80-89	Shape and space	Classify and describe 3-D and 2-D shapes, referring to reflective symmetry, faces, sides/edges, vertices, angles. Read and begin to write the vocabulary of position. Use spaces on square grids. Identify right angles in 2-D shapes and in the environment. Investigate general statements about shapes.	SS351, SS353 SS3515 SS355	SS3L2 SS3L3
		62-65	Reasoning about shapes	Assess and review		

Sample medium term plans for Year 3

Solving Problems

Year 3 Contents

Planning grid

Lessons

SP3L1	Domino puzzles Investigating ways of arranging dominoes in a square or rectangle so that each side has the same number of spots
SP3L2	Partitioning problems Investigating ways of partitioning a number up to 30, given rules about the relationships between the parts
SP3L3	Target games Investigating ways of choosing two, three or four numbers to make a given total
SP3L4	Sums and differences Choosing and using operations to create sums and differences of 2-digit numbers
SP3L5	Place value problems Using knowledge of place value in strategic number games and puzzles
SP3L6	Money problems Working out totals, change, and which coins to use to pay for items
SP3L7	New shapes from old Investigating the shapes that can be created by joining two identical shapes and making general statements about attributes
SP3L8	Symmetry investigation Investigating the symmetry of shapes made up of squares (rectilinear shapes)
SP3L9	Time problems Solving one- and two-step word problems involving time
SP3L10	Using diagrams to solve problems Counting on and back in steps of 2, 3, 4, 5 and 10 from any number and using Venn and Carroll diagrams to sort numbers according to one criterion

Solving Problems

Year 4 Contents

Planning grid

Lessons

SP4L1	Money problems Working out amounts that can be made from given coins
SP4L2	Making numbers from digits Using knowledge of place value to investigate the numbers that can be made from given digits
SP4L3	Grid problems Investigating what numbers to cover on a grid to fulfil given conditions
SP4L4	Pick three numbers Investigating ways of choosing two or three numbers to make a total of 10, 20, 50 or 100
SP4L5	Grouping sets of numbers Grouping sets of numbers according to given rules
SP4L6	'Real life' money problems Solving money problems involving addition and subtraction using a structured approach
SP4L7	Investigating prisms Investigating a general statement about prisms
SP4L8	Direction investigations Investigating possible routes between two points on a grid using compass directions
SP4L9	Capacity problems Solving capacity problems involving one or more steps
SP4L10	Using diagrams to solve problems Answering questions about numbers by sorting them according to two criteria on to Venn and Carroll diagrams and identifying multiples of 2, 3, 4, 5 and 10

Solving Problems

Year 5 Contents

Planning grid

Lessons

SP5L1	Totting up numbers Arranging numbers along the sides of triangles or squares so that the numbers along each side have the same total
SP5L2	Remainders Investigating sequences and patterns involving remainders
SP5L3	More place value problems Using knowledge of place value in puzzles and investigations
SP5L4	Adding multiples Investigating sums of multiples of two different numbers
SP5L5	Missing digits Solving calculation problems with missing digits
SP5L6	Investigating triangles Classifying the triangles formed by a regular hexagon and its diagonals, and investigating the different triangles that can be drawn on dotty grids
SP5L7	Distance problems Using a distance chart in kilometres to solve problems involving mental addition and subtraction
SP5L8	Money problems Solving money problems in the context of a trip to the zoo, including investigations of combinations of amounts with a given total
SP5L9	Investigating diagonals Investigating general statements about diagonals
SP5L10	Euro problems Solving problems that involve converting pounds to euros and vice versa

Solving Problems

Year 6 Contents

Planning grid

Lessons

SP6L1	Dartboard problems Investigating ways of adding multiples of numbers to make a given total
SP6L2	Multiplication problems Solving problems involving multiplication
SP6L3	Magic shapes Arranging numbers along the lines forming a shape so that the three numbers along each line have the same total
SP6L4	Fraction and decimal problems Investigating equivalent fractions and decimals
SP6L5	Adding decimals Solving problems involving adding and ordering decimals
SP6L6	Perimeter and area investigations Investigating the perimeter and area of compound shapes made up of rectangles
SP6L7	Scales and graphs Reading scales and interpreting graphs and bar charts to solve measurement problems
SP6L8	Using a calculator Using a calculator to solve problems
SP6L9	Percentages Solving problems involving percentages
SP6L10	Using tables and bar charts Extracting data from tables and bar charts to solve problems

Solving Problems Year 3

Planning grid

Year 3 Framework objectives	Mult-e-Maths Starters and Lessons
(p61) Choose and use appropriate operations to solve word problems, and appropriate ways of calculating	SP3L9 Time problems Solving one- and two-step word problems involving time
(p63) Solve mathematical problems or puzzles, recognise simple patterns and relationships, generalise and predict. Suggest extensions by asking 'What if...?'	SP3L1 Domino puzzles Investigating ways of arranging dominoes in a square or rectangle so that each side has the same number of spots
	SP3L2 Partitioning problems Investigating ways of partitioning a number up to 30, given rules about the relationships between the parts
	SP3L3 Target games Investigating ways of choosing two, three or four numbers to make a given total
	SP3L4 Sums and differences Choosing and using operations to create sums and differences of 2-digit numbers
	SP3L5 Place value problems Using knowledge of place value in strategic number games and puzzles
	SP3L10 Using diagrams to solve problems Counting on and back in steps of 2, 3, 4, 5 and 10 from any number and using Venn and Carroll diagrams to sort numbers according to one criterion
(p65) Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it	SP3L7 New shapes from old Investigating the shapes that can be created by joining two identical shapes and making general statements about attributes
	SP3L8 Symmetry investigation Investigating the symmetry of shapes made up of squares (rectilinear shapes)
(pp67, 69) Solve word problems involving numbers in 'real life', money and measures, using one or more steps, including finding totals and giving change, and working out which coins to pay. Explain how the problem was solved	SP3L6 Money problems Working out totals, change, and which coins to use to pay for items

Key to lesson references

SP3L1 refers to Solving Problems Year 3 Lesson 1