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KS2 Solving Problems Teacher's Notes

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Introduction to Mult-e-Maths teacher's notes

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 gr

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	add/subtract mentally	Finding the missing numbers in additions and subtractions and using one number fact
Osing known number racis and prace value to neigh mental calculation		AS3L18 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 EXERVIDENT Fraction and develop and and metal ability (e.g. counting, metal attrategies, rapid recall of * *, *, * and * facts). Exert and set the increments in 15 and corresponding habit.

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 foures and words.	NS3S4	NS3L2
			esomating, rounding	Know what each digit represents, and partition 3-digit numbers into a multiple of 100, a multiple of 10, and ones.	N53S12	NS3L3
				Read and begin to write the vocabulary of estimation. Estimate up to 100 objects.	NS3S3 NS3S1	NS3L1
		76-77	Reading numbers from scales	Read scales to the nearest division.	553513	
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.		AS3£15, SP3L6
		32-41	Mental calculation strategies (+ and -)	Put the larger number first to count on. Identify near doubles. Bridge through a multiple of 10 and adjust.	AS3S11 AS3S21 AS3S17, AS3S18, AS3S23	AS3L13 AS3L12 AS3L7
		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.	NS352. NS3511	NS3L4
4-6	13	80-89	Measures, including problems Shape and space	Read time to 5 minutes. Read and begin to write the vicabulary related to being it. Read and begin to write the vicabulary related to being it. Read scales to the research division. Use decream industry for any of mad on. Read scales to the nearest division. Use decream industry for any of mad on. Measure and compare using mad on. Measure and compare using mad on. Suggest sustained units and expirement to extend or one service surprise procedure, or an instead extended or research surgings. Including laws. Record to exercit which shall not, or an instead extended or research surgings. Including laws. Record to exercit which shall not, or an instead or and calculation method to solve word problems. Classify and describe 3-10 and 2.0 shapes, sidelined one of the control of the con	55359 55351, 55353	SSN.7
				sides/edges, vertices, angles. Read and begin to write the vocabulary of position. Use spaces on square grids.	SS3S15 SS3S5	SS3L3
				Identify right angles in 2-D shapes and in the environment.	22300	
7	2	62-65	Reasoning about shapes Assess and review	Investigate general statements about shapes.		

Sample medium term plans for Year 3

Introduction to Mult-e-Maths teacher's notes

Teacher's notes

Each strand except Solving Problems consists of separate starters and lessons to enable you to mix and match starter and lesson activities appropriate to your planning. (The starters for Solving Problems are incorporated within the lessons, because each starter is designed to revise specific maths skills needed in the problem-solving lesson activity.) All of the activities are accompanied by teacher's notes.

The teacher's notes for starters include the following sections:

- Objective(s) from the NNS Framework
- Prior knowledge and skills to help you to plan when it is appropriate to incorporate this activity into your teaching
- Vocabulary
- Resources
- Main teaching activity to give a suggested order of teaching, plus notes on using the Mult-e-Maths activity
- Probing questions

In addition to these sections, teacher's notes for lessons may also include some or all of the following:

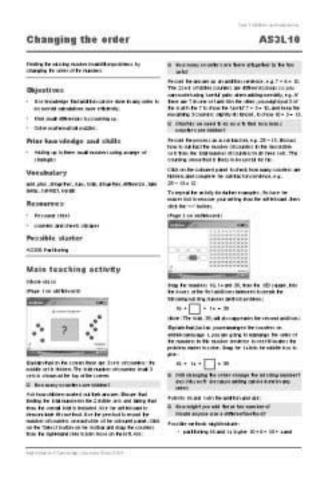
- Differentiated pupil activities
- Plenary
- Key idea and assessment to suggest a focus for what to assess during the plenary
- Solutions to pupil activities

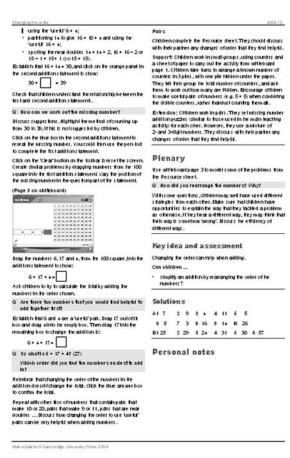
For ease of reference, each activity and its accompanying teacher's notes are coded, for example:

- FD6S17 means Year 6 Starter 17 of the Fractions, Decimals, Percentages, Ratio and Proportion Strand.
- AS3L7 means Year 3 Lesson 7 of the Addition and Subtraction Strand.

The codes for the six Mult-e-Maths Strands are:

- **FD** Fractions, Decimals, Percentages, Ratio and Proportion
- NS Numbers and the Number System
- AS Addition and Subtraction
- MD Multiplication and Division
- SS Measures, Shape, Space and Handling Data
- SP Solving Problems





Sample teacher's notes for AS3L10



Solving Problems

Year 3 Contents

Planning grid

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

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

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
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Solving Problems

Year 6 Contents

Planning grid

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



Mult-e-Maths and the National Numeracy Strategy Framework

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	SP3L1 Domino puzzles Investigating ways of arranging dominoes in a square or rectangle so that each side has the same number of spots
relationships, generalise and predict. Suggest extensions by asking 'What if?'	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	SP3L7 New shapes from old Investigating the shapes that can be created by joining two identical shapes and making general statements about attributes
examples that satisfy it	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