CAMBRIDGE   HITACHI

Mult e Maths

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.

Planning grid for Addition and Subtraction Year 3

Sample medium term plans for Year 3

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

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