Year 6 Planning grid

Introduction

This document is designed to help you to match activities from the *Mult-e-Maths* strand discs with the renewed *Primary Framework*.

The planning grid lists all the Year 6 learning objectives from the *Primary Framework* arranged in the seven Framework strands:

- Using and applying mathematics
- Counting and understanding number
- Knowing and using number facts
- Calculating
- Understanding shape
- Measuring
- Handling data

End-of-year expectations are given in **bold.**
Some **'**Year 6 progression to Year 7' objectives are also included. These are given in *italic*.

Each *Mult-e-Maths* activity is matched to the Framework learning objective it links to most closely. In some cases a *Mult-e-Maths* activity now better matches a different year group from that given in its activity reference, e.g. the finding differences between positive and negative integers concepts discussed in 'AS5L2: Temperature differences' are now better suited to the Year 6 learning objectives. Such activities are marked in the planning grid with an asterisk, e.g. * **MD5L2 Temperature differences**

Mult-e-Maths lessons and starters are referenced in the planning grid by the strand CD-ROM they were included on and by their activity number:

FD refers to the Fractions, Decimals, Percentages, Ratio and Proportion strand
NS refers to the Numbers and the Number System strand
AD refers to Additions and Subtraction strand
MD refers to Multiplication and Division strand
SS refers to Measures, Shape, Space and Handling Data strand
SP refers to the Solving Problems strand

AS6S1 refers to Addition and Subtraction Year 6 Starter 1
AS6L1 refers to Addition and Subtraction Year 6 Lesson 1

For ease of reference, all lessons are highlighted are in grey.

We are developing a fully revised edition of *Mult-e-Maths* matched to the renewed Primary Framework. For further information about this please call the Education Information Line on 01223 325013, or email educustserve@cambridge.org

Using and applying	
Learning objectives	**Mult-e-Maths Starters and Lessons**
Solve multi-step problems, and problems involving fractions, decimals and percentages; choose and use appropriate calculation strategies at each stage, including calculator use	**SP6L1 Dartboard problems** Investigating ways of adding multiples of numbers to make a given 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
	SP6L8 Using a calculator Using a calculator to solve problems
	SP6L9 Percentages Solving problems involving percentages
	MD6L12 Solving real life problems Solving single-step and multi-step problems that involve some multiplication or division
	MD6L14 Division and decimals Using a calculator to solve division problems that involve numbers with up to two decimal places
Tabulate systematically the information in a problem or puzzle; identify and record the steps or calculations needed to solve it, using symbols where appropriate; interpret solutions in the original context and check their accuracy	**SP6L7 Scales and graphs** Reading scales and interpreting graphs and bar charts to solve measurement problems
	SS6L11 Solving time problems Creating a timeline and a timetable using 24-hour clock times
Suggest, plan and develop lines of enquiry; collect, organise and represent information, interpret results and review methods; identify and answer related questions	**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
	SP6L10 Using tables and bar charts Extracting data from tables and bar charts to solve problems
Represent and interpret sequences, patterns and relationships involving numbers and shapes; suggest and test hypotheses; construct and use simple expressions and formulae in words then symbols (e.g. the cost of *c* pens at 15 pence each is 15*c* pence)	**NS6S3 Using square numbers** Exploring patterns between square numbers and multiplication facts
	NS6S6 Investigating doubles Investigating whether doubles of 2-digit numbers are odd or even, and identifying numbers with doubles that are multiples of 4
	NS6S14 Properties of numbers Identifying numbers that have one, two or three given properties
	NS6S15 What's my number? Asking questions to identify a number
	NS6L3 Triangular numbers Investigating the sequence of triangular numbers
	NS6L6 Odd or even? Using visual representations to illustrate general statements about calculating with odd and even numbers
	NS6L12 Finding a rule or formula Describing, extending and explaining number sequences, based on patterns, in words and using a formula
	MD6S16 Investigating the sum of products Investigating how to arrange given numbers in a sum of two products to produce the largest and smallest answers

Explain reasoning and conclusions, using words, symbols or diagrams as appropriate	**All of the lessons above link to this objective**
Counting and understanding number	
Learning objectives	**Mult-e-Maths Starters and Lessons**
Find the difference between a positive and a negative integer, or two negative integers, in context	**NS6S5 Positive and negative numbers** Identifying positive and negative numbers with the greatest difference
	NS6L5 Positive and negative numbers Moving from finding differences in the context of temperature to finding the difference between any integers (positive and negative)
	AS6S5 Finding differences Calculating rises and falls between pairs of temperatures, that include at least one negative temperature
	* **AS5L2 Temperature differences** Finding differences between pairs of temperatures, including negative temperatures
Use decimal notation for tenths, hundredths and thousandths; partition, round and order decimals with up to three places, and position them on the number line	**NS6L2 Decimals on a number line** Using knowledge of place value to estimate the position of decimals on undivided number lines
	NS6S9 Rounding Estimating and rounding numbers on an undivided number line
	FD6S8 Sort by rounding Rounding a set of decimals with one or two places to the nearest whole number or tenth
	FD6S9 Comparing distances Comparing two distances with up to two decimal places
	FD6S10 Zap the digits Using a calculator to change a decimal number to zero, digit by digit
	FD6S11 Place value bingo A bingo game involving recognition of the value of each digit in a number with three decimal places
	FD6S17 Decimal positions Ordering decimals with either one or two decimal places or a mixture of both
	FD6L7 Tenths, hundredths, thousandths Positioning and identifying numbers with up to three places of decimals on a number line
	FD6L8 Rounding decimals Rounding decimals with up to two decimal places to the nearest whole number and to the nearest tenth
	FD6L9 Ordering decimals Ordering mixed sets of measures or decimal numbers with up to three decimal places
	FD6L10 Decimal calculations Using knowledge of place value to change one number to another in one step and to solve simple problems involving measures
Express a larger whole number as a fraction of a smaller one (e.g. recognise that 8 slices of a 5-slice pizza represents $^{8}/_{5}$ or $1\,^{3}/_{5}$ pizzas); simplify fractions by cancelling common factors; order a set of fractions by converting them to fractions with a common denominator	**FD6S3 Ordering fractions** Ordering up to five fractions
	* **FD5S4 Order fractions** Ordering familiar fractions on a number line
	FD6L2 Simplest forms Reducing fractions to simplest forms by cancelling common factors

Express a larger whole number as a fraction of a smaller one (e.g. recognise that 8 slices of a 5-slice pizza represents $^{8}/_{5}$ or $1\,^{3}/_{5}$ pizzas); simplify fractions by cancelling common factors; order a set of fractions by converting them to fractions with a common denominator **(continued)**	**FD6L3 Ordering fractions** Ordering fractions by converting them to fractions with a common denominator
	FD6L4 Mixed numbers Converting improper fractions to mixed numbers and vice versa
Express one quantity as a percentage of another (e.g. express £400 as a percentage of £1000); find equivalent percentages, decimals and fractions	**FD6S12 Equivalent pairs** Matching pairs of decimal and fraction equivalents in the traditional game of pelmanism
	FD6S14 Percentage bingo Matching equivalent fractions and percentages in a game of bingo
	FD6S19 Odd one out Identifying which fraction, decimal or percentage out of three is not equivalent to the other two
	FD6L11 Fraction and decimal equivalences Converting decimals to fractions and mixed numbers and vice versa, using a number line for support
	FD6L12 Calculator conversions Using a calculator to convert fractions to their decimal equivalents
	FD6L14 Percentages and fractions Converting simple fractions to percentages and vice versa
	FD6L15 Percentages, fractions and decimals Finding decimal and fraction equivalents to decimals and solving percentage problems
Solve simple problems involving direct proportion by scaling quantities up or down	**FD6S18 Showing ratios and proportions** Colouring a grid of squares in a given ratio or proportion
	FD6L6 Ratio and proportion Investigating ideas of ratio and proportion in different contexts

Knowing and using number facts

Learning objectives	Mult-e-Maths Starters and Lessons
Use knowledge of place value and multiplication facts to 10 × 10 to derive related multiplication and division facts involving decimals (e.g. 0.8 × 7, 4.8 ÷ 6)	**MD6S2 Doubling and halving decimals** Finding doubles and halves of decimals
	MD6S10 Decimal jumps Multiplying single-digit numbers by decimals, with tenths only
	* **FD5S10 Multiplying decimals** Multiplying decimals and recording the result
Use knowledge of multiplication facts to derive quickly squares of numbers to 12 × 12 and the corresponding squares of multiples of 10	* **NS5L4 Square numbers** Investigating square numbers
Recognise that prime numbers have only two factors and identify prime numbers less than 100; find the prime factors of two-digit numbers	**NS6S7 Prime factors** Identifying prime factors of numbers to 100
	NS6L8 Spot the prime Identifying numbers with exactly two factors, the number itself and 1, as prime numbers
	NS6L11 Factor trees Finding prime factors

Year 6 progression to Year 7 *Consolidate rapid recall of number facts, including multiplication facts to 10 × 10 and the associated division facts*	**MD6S1 Multiplication facts** Recalling multiplication facts
Year 6 progression to Year 7 *Recognise and use multiples, factors, divisors, common factors, highest common factors and lowest common multiples in simple cases*	**NS6S8 Common multiples** Identifying common multiples
	MD6S9 Shared products Using known multiplication facts to find products that are common to two numbers
Use approximations, inverse operations and tests of divisibility to estimate and check results	**NS6S13 Estimating calculations** Approximating answers to additions and multiplications
Use approximations, inverse operations and tests of divisibility to estimate and check results **(continued)**	**MD6S6 Estimating answers to divisions** Using knowledge of multiplication facts and/or rounding to estimate the answers to divisions
	AS6S8 Estimating money amounts Rounding and estimating amounts of money
	FD6S4 What's the remainder? Working out remainders when dividing
	NS6L7 Divisibility tests Finding and applying tests of divisibility for 3, 6 and 9
	NS6L9 Rounding to estimate Exploring the effect of rounding an integer to the nearest 10, 100 or 1000 on the estimate of a calculation
	NS6L10 Estimating answers Using estimating to spot incorrect answers to calculations
Calculating	
Learning objectives	**Mult-e-Maths Starters and Lessons**
Calculate mentally with integers and decimals: U.t ± U.t, TU × U, TU ÷ U, U.t × U, U.t ÷ U	**AS6L2 Adding several numbers** Choosing an efficient strategy for adding several whole numbers or several decimals with one decimal place
	AS6L3 Approximating, then adjusting Practising adding and subtracting the nearest multiple of 10, 100 or 1000 and adjusting by 1 and applying the method to decimals with one decimal place
	AS6L4 Calculating with decimals Using a range of strategies to calculate with decimals
	MD6S4 Multiplying by teens Using known multiplication facts to find larger multiples
	MD6S5 Consolidating mental calculation Practising mental multiplication and division of integers and decimals
	MD6S15 Multiplying by partitioning Using partitioning to multiply 2-digit numbers by 1-digit numbers
	MD6L1 Making larger multiples Using known multiplication facts up to 10 × 10 to find multiplication facts for larger numbers
	MD6L4 Splitting numbers Multiplying 2- and 3-digit integers, and 2-digit decimals with one decimal place, by breaking them into manageable parts

Calculate mentally with integers and decimals: U.t ± U.t, TU × U, TU ÷ U, U.t × U, U.t ÷ U **(continued)**	**MD6L8 Related calculations with decimals** Using the relationship between multiplication and division with decimal numbers
	NS6S12 Decimal count Describing and continuing number sequences with decimal fraction step sizes
	FD6S7 Decimal counting Counting on and back in decimal fraction steps
Year 6 progression to Year 7 *Understand how the commutative, associative and distributive laws, and the relationships between operations, including inverse operations, can be used to calculate more efficiently; use the order of operations, including brackets*	**MD6L2 Using doubling and halving** Using doubling and halving to multiply larger numbers
	MD6L3 Egyptian and Russian multiplication Using methods involving doubling and halving to multiply larger numbers
	MD6L7 Related calculations Using the relationship between multiplication and division to help with calculating
	MD6L9 Using factors Using factors to help multiply pairs of 2-digit numbers
Year 6 progression to Year 7 *Consolidate and extend mental methods of calculation to include decimals, fractions and percentages*	**AS6S2 Adding decimals** Working mentally to find missing decimals in addition sentences
	AS6S4 Complements to 1 Finding pairs of decimal fractions with two decimal places to make 1
	AS6S7 Differences in measures Finding differences between pairs of lengths written in decimal notation
	AS6S9 Calculating mentally Using a range of mental calculation strategies to solve problems
Use efficient written methods to add and subtract integers and decimals, to multiply and divide integers and decimals by a one-digit integer, and to multiply two-digit and three-digit integers by a two-digit integer	**AS6L5 Written addition** Refining the written method of column addition and deciding when to use it
	AS6L6 Written subtraction Refining the written method of column subtraction and deciding when to use it
	AS6L7 Adding and subtracting decimals Relating written and mental methods of adding and subtracting whole numbers to decimals
	MD6L5 Multiplication with decimals Using pencil and paper methods to multiply decimal numbers by breaking them into their place value components
	MD6L6 Using multiples with division Developing an informal written method, for division of HTU by TU, that uses multiples of the divisor
	MD6L10 Dividing decimals Developing informal written methods to divide numbers with one decimal place by single-digit integers
	MD6L11 The grid method of multiplication Developing use of the grid method to multiply ThHTU by U and HTU by TU
Relate fractions to multiplication and division (e.g. $6 \div 2 = {}^{1}\!/_{2}$ of $6 = 6 \times {}^{1}\!/_{2}$); express a quotient as a fraction or decimal (e.g. $67 \div 5 = 13.4$ or $13{}^{2}\!/_{5}$); find fractions and percentages of whole-number quantities (e.g. ${}^{5}\!/_{8}$ of 96, 65% of £260)	**FD6S5 Finding fractions** Finding a unit fraction of a number that equals a given number
	FD6S13 Which is bigger? Comparing pairs of percentages of quantities
	FD6S15 Parts of quantities Identifying true and false statements about fractions and percentages of units of measure and money
	FD6L5 Fractions of numbers and quantities Calculating fractions of numbers and quantities

Relate fractions to multiplication and division (e.g. 6 ÷ 2 = $^1/_2$ of 6 = 6 × $^1/_2$); express a quotient as a fraction or decimal (e.g. 67 ÷ 5 = 13.4 or $13^2/_5$); find fractions and percentages of whole-number quantities (e.g. $^5/_8$ of 96, 65% of £260) **(continued)**	**FD6L13 Percentages of money** Finding simple percentages and using percentages that are known to deduce unknown percentages
	* **MD5S8 Divisions with decimal answers** Dividing whole numbers by single-digits to produce decimal answers, and checking answers using multiplication
	* **MD5L10 Remainders and fractions** Expressing remainders as fractions
Use a calculator to solve problems involving multi-step calculations	**MD6L13 Using the calculator's memory** Using the memory function of a calculator to solve multi-step problems that involve some multiplication or division
Understanding shape	
Learning objectives	**Mult-e-Maths Starters and Lessons**
Describe, identify and visualise parallel and perpendicular edges or faces and use these properties to classify 2-D shapes and 3-D solids	**SS6S1 Comparing 2-D shapes** Describing and comparing the properties of quadrilaterals
	SS6S7 Sorting 3-D shapes Sorting 3-D shapes in a Venn diagram according to three criteria
	SS6L1 Quadrilaterals Identifying the properties of quadrilaterals in order to name and classify them
	SS6L2 3-D shapes Visualising 3-D shapes from 2-D drawings
Make and draw shapes with increasing accuracy and apply knowledge of their properties	**SS6L4 Tangrams** Investigating how shapes fit together to make other shapes
Visualise and draw on grids of different types where a shape will be after reflection, after translations, or after rotation through 90° or 180° about its centre or one of its vertices	**SS6S3 Translating shapes** Giving the coordinates of a shape after translations and describing translations given the starting and finishing coordinates
	SS6S6 Rotating shapes Giving the coordinates of a shape after a rotation about a vertex
	SS6L5 Rotation Exploring rotations of shapes about one vertex
Use coordinates in the first quadrant to draw, locate and complete shapes that meet given properties	**SS6S2 Coordinates** Giving the coordinates of points to complete polygons
	SS6L3 Drawing polygons Using coordinates, or angles and side lengths, to draw polygons
Estimate angles, and use a protractor to measure and draw them, on their own and in shapes; calculate angles in a triangle or around a point	**SS6S4 Angles** Identifying and estimating acute and obtuse angles, and investigating the effect of changing the size of an angle in a right-angled triangle
	SS6S5 Calculating angles Calculating missing angles in triangles
Measuring	
Learning objectives	**Mult-e-Maths Starters and Lessons**
Select and use standard metric units of measure and convert between units using decimals to two places (e.g. change 2.75 litres to 2750 ml, or vice versa)	**SS6S10 Which units?** Suggesting suitable imperial and metric units to measure everyday objects
	SS6L9 Comparing capacities? Exploring the relationships between different standard measures for capacity

Read and interpret scales on a range of measuring instruments, recognising that the measurement made is approximate and recording results to a required degree of accuracy; compare readings on different scales, for example when using different instruments	**SS6S9 Measuring cylinder scales** Identifying the scale on a measuring cylinder and solving problems based on it
	SS6L8 Recording mass Solving problems involving mass and recording masses in different ways
Year 6 progression to Year 7 Solve problems by measuring, estimating and calculating; measure and calculate using imperial units still in everyday use; know their approximate metric values	**SS6S11 Imperial and metric masses** Finding objects with approximately equal masses, using imperial and metric units
	SS6S12 Time zones Using a time zone map to identify the time in different parts of the world
	SS6L6 Time and time zones Introducing times around the world
Calculate the perimeter and area of rectilinear shapes; estimate the area of an irregular shape by counting squares	**SS6S8 Compound shapes** Calculating the perimeter and area of simple compound shapes with missing side lengths
	SS6L7 Compound shapes Calculating and comparing the areas and perimeters of compound shapes

Handling data

Learning objectives	Mult-e-Maths Starters and Lessons
Describe and predict outcomes from data using the language of chance or likelihood	**SS6S15 Investigating chance** Investigating whether you are more likely to throw an odd or an even total score using two dice
	SS6L12 Probability Exploring probability
Solve problems by collecting, selecting, processing, presenting and interpreting data, using ICT where appropriate; draw conclusions and identify further questions to ask	**SS6L10 Interpreting data** Thinking about how to organise and interpret data
Construct and interpret frequency tables, bar charts with grouped discrete data, and line graphs; interpret pie charts	**SS6S13 Pounds and euros** Using a conversion graph to convert pounds to euros
Describe and interpret results and solutions to problems using the mode, range, median and mean	**SS6S14 Averages** Finding the mode, range, median and mean values of sets of data