Primary Mathematics Curriculum Framework

UNIVERSITY of CAMBRIDGE
International Examinations

Primary Mathematics Curriculum Framework

This Mathematics Curriculum Framework is based on the primary National Curriculum and the National Numeracy Strategy, which have been implemented in England, but has been designed specifically for teachers and students in the international context.

This detailed framework should facilitate the development of courses that are stimulating both for the students and for the teachers. The knowledge and skills developed should help ensure a smooth transition from primary to secondary schooling, particularly for those who will be progressing to the Cambridge Checkpoint scheme and then on to Cambridge qualifications such as GCE O Level or IGCSE.

The Mathematics Curriculum Framework is organised into six stages. Each stage reflects the teaching targets for a year group in the primary phase. The framework covers the first year of primary teaching, when students are approximately 5 years old (stage 1), to the final year of primary, when students are approximately 11 years old (stage 6). The six stages, therefore, cover the whole primary phase from 5 to 11 years. However, in different educational contexts, it may be appropriate to introduce this framework at slightly different ages.

University of Cambridge International Examinations (CIE) produces the Cambridge International Primary Achievement Test in mathematics for the end of primary teaching. This test is moderated in Cambridge and statements of achievement are issued to students.

Cambridge Primary Progression Tests are available for Stages 3 – 6 to help schools monitor student progress. The tests are not pass/fail and do not lead to a qualification; instead they provide a benchmark for schools calibrated against an international cohort. They are designed to provide information for teachers, students and parents about the progress being made and the strengths and weaknesses of individuals and groups.

The Mathematics Curriculum Framework is divided into four strands, as shown below.

- Number
  - Numbers and the number system
  - Calculations
  - Mental skills
- Problem Solving
- Organising and Using Data
- Shape, Space and Measures
  - Patterns and properties of shape
  - Properties of position and movement
  - Measures

Stage 1: Number

Numbers and the Number System

Pupils should:

- Count, read and write numbers to 20
- Create and describe simple number patterns and sequences using mathematical vocabulary
- Begin to know that the position of a digit gives its value in relation to two-digit numbers
- Compare and order numbers to at least 20
- Use the = sign to represent equality
- Within the range of 0 to 30, say the number that is 1 or 10 more or less than any given number
- Understand and use vocabulary of estimation up to 30 objects

Calculations

Pupils should:

- Understand addition and use related vocabulary
- Begin to understand that addition can be done in any order and that more than two numbers can be added together
- Understand subtraction as 'take away' and 'difference' and use related vocabulary
- Begin to use the +, – and = signs and to recognise the use of symbols such as □ and△ to stand for an unknown number
- Know addition and subtraction facts by heart – all pairs of numbers with a total of 10, addition doubles of all numbers to at least 5 (e.g. 4 + 4)
- Begin to know addition facts for all pairs of numbers to at least 10, and the corresponding subtraction facts

Mental Skills

Pupils should:

- Know that addition can be done in any order to make strategies more efficient
- Develop rapid recall of basic number facts
- Develop a range of mental methods for carrying out simple calculations within the range 0 to at least 20
- Begin to bridge through 10 and 20 when adding a single digit number

Stage 1: Problem Solving

Pupils should:

- Choose sensible calculation methods, mental and written, to solve whole-number problems
- Solve simple problems or puzzles and predict from simple patterns and relationships
- Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it
- Explain methods and reasoning orally
- Solve simple problems set in 'real-life' contexts such as money, using counting, addition, subtraction, doubling and halving, explaining methods and reasoning orally
- Recognise coins of different values
- Find totals and change from 20 cents
- Work out how to pay an exact sum using smaller coins
- Check that answers are reasonable

Stage 1: Organising and Using Data

Pupils should:

- Solve relevant problems by using simple lists, tables, objects or pictures to sort, classify and organise information
- Explain methods and reasoning

Stage 1: Shape, Space and Measures

Patterns and Properties of Shape

Pupils should:

- Use everyday language to describe features of familiar 2-D and 3-D shapes such as faces, corners and edges
- Make and describe models, patterns and pictures and begin to relate solid shapes to pictures of them

Properties of Position and Movement

Pupils should:

- Use everyday language to describe position, direction and movement
- Understand 'turn', 'half turn', 'whole turn' and 'right angle'
- Use one or more shapes to make, describe and continue repeating patterns

Measures

Pupils should:

- Compare two or more lengths, masses or capacities by direct comparison
- Compare and measure objects using non-standard and standard units
- Understand and use vocabulary related to time
- Order familiar events in time
- Know days of the week and seasons of the year
- Read the time to the half hour or hour on analogue clocks

Stage 2: Number

Numbers and the Number System

Pupils should:

- Count, read and write whole numbers to at least 100 in numbers and words
- Group up to 100 objects (e.g. in tens, fives or twos)
- Describe and extend simple number sequences starting from any two-digit number
- Recognise odd and even numbers to at least 30
- Begin to recognise two-digit multiples of 2, 5 or 10
- Understand place value in two-digit numbers
- Compare and order numbers to at least 100
- Use the = sign to represent equality
- Compare two two-digit numbers
- Say the number that is 1 or 10 more or less than any given two-digit number
- Understand and use the vocabulary of estimation up to 50 objects
- Round numbers less than 100 to the nearest 10
- Begin to recognise and find one half and one quarter of shapes and small numbers of objects
- Begin to recognise that two halves or four quarters make one whole, and that two quarters and one half are equivalent

Calculations

Pupils should:

- Extend understanding of addition and subtraction
- Understand that addition can be done in any order but not subtraction
- Use the +, – and = signs and recognise the use of symbols (e.g. □ and △, to stand for an unknown number)
- Know addition and subtraction facts by heart – all pairs of numbers with a total of 10, addition doubles of all numbers to at least 5 (e.g. 4 + 4)
- Begin to know addition facts for all pairs of numbers to at least 10, and the corresponding subtraction facts
- Understand that more than two numbers can be added
- Begin to add three single-digit numbers together mentally (up to a total of 20)
- Begin to add three two-digit numbers using apparatus (up to a total of 100)
- Understand that subtraction is the inverse of addition
- Know addition and subtraction facts by heart for each number to at least 10
- Know all pairs of numbers with a total of 20
- Know all pairs of multiples of 10 with a total of 100
- Understand multiplication as repeated addition
- Begin to understand division as grouping (repeated subtraction) or sharing
- Use the x, ÷ and = signs and recognise the □ and △ symbols as unknown numbers
- Know and use halving as the inverse of doubling
- Know by heart multiplication facts for the 2 and 10 times tables
- Begin to know multiplication facts for the 5 times table
- Calculate quickly division facts related to the 2 and 10 times tables
- Know doubles of numbers to at least 15
- Know doubles of multiples of 5 to 50
- Know halves of multiples of 10 to 100
- Check results by repeating addition in a different order or with an equivalent calculation

Mental Skills

Pupils should:

- Know that addition can be done in any order to make strategies more efficient
- Use known number facts and place value to add/subtract mentally
- Understand the subtraction that corresponds to a given addition and vice versa
- Bridge through 10 or 20 and then adjust the answer
- Use known number facts and place value to carry out simple multiplications and divisions

Stage 2: Problem Solving

Pupils should:

- Choose and use appropriate operations and strategies to solve problems
- Solve simple problems or puzzles, generalise and predict from simple patterns and relationships
- Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it
- Explain methods and reasoning orally and in writing
- Solve simple problems set in 'real-life' contexts such as money, using mental addition and subtraction, simple multiplication and division to solve simple word problems using one or two steps and explain the method used
- Recognise coins of different values and use notation for money
- Find totals and change from 20 cents
- Find totals, give change and work out how to pay an exact sum using smaller coins
- Check that answers are reasonable

Stage 2: Organising and Using Data

Pupils should:

- Solve relevant problems by using simple lists, tables, pictograms and block graphs to sort, classify and organise information
- Explain methods and reasoning

Stage 2: Shape, Space and Measures

Patterns and Properties of Shape

Pupils should:

- Use mathematical names for common 2-D and 3-D shapes and describe some of their features such as faces, corners, symmetry and edges
- Make and describe shapes, pictures and patterns

Properties of Position and Movement

Pupils should:

- Use mathematical vocabulary to describe position, direction and movement
- Understand 'quarter turn', 'half turn', 'whole turn' to the left or right, clockwise or anti-clockwise
- Know that a right angle is a quarter turn and recognise right angles in squares and rectangles
- Give instructions for navigating a route involving straight lines and right-angle turns

Measures

Pupils should:

- Estimate, measure and compare lengths, masses or capacities, selecting and using standard units and measuring equipment
- Read a simple scale
- Use a ruler to draw and measure to the nearest centimetre
- Use and begin to read vocabulary related to time
- Use units of time and understand relationships between them
- Order the months of the year
- Read the time to the hour, half hour and quarter hour on an analogue clock and a 12-hour digital clock and understand the notation 7:30

Stage 3: Number

Numbers and the Number System

Pupils should:

- Read and write whole numbers to at least 1,000 in figures and words
- Count by grouping in tens and other numbers
- Describe and extend number sequences, count on or back in tens or hundreds starting from any two-digit or three-digit number
- Recognise odd and even numbers to at least 100
- Recognise two-digit and three-digit multiples of 2, 5 or 10, and three-digit multiples of 50 and 100
- Understand place value in three-digit numbers
- Compare and order numbers to at least 100
- Say the number that is 1, 10 or 100 more or less than a given two-digit or three-digit number
- Order whole numbers to at least 1,000
- Understand and use the vocabulary of estimation up to 100 objects
- Round any two-digit number to the nearest 10 and any three-digit number to the nearest 100
- Recognise unit fractions and use them to find fractions of shapes and numbers
- Begin to recognise simple fractions that are several parts of the whole and simple equivalent fractions
- Estimate a simple fraction

Calculations

Pupils should:

- Extend understanding of addition and subtraction
- Add three or four single-digit numbers mentally, or three or four two-digit numbers using apparatus or pencil and paper
- Know addition and subtraction facts for each number to 20 and all pairs of multiples of 100 with a total of 1,000
- Calculate quickly all pairs of multiples of 5 with a total of 100
- Add/subtract three-digit numbers using pencil and paper procedures
- Extend understanding of multiplication and division
- Recognise that division is the inverse of multiplication
- Begin to find remainders after simple division
- Round up or down after division where necessary
- Know multiplication facts for the 2, 5 and 10 times tables and begin to know the 3 and 4 times tables
- Calculate quickly division facts related to the 2, 5 and 10 times tables
- Know doubles of numbers to at least 20
- Know doubles of multiples of 5 to 100
- Know doubles of multiples of 50 to 500
- Check results of calculations by repeating addition in a different order or with an equivalent calculation

Mental Skills

Pupils should:

- Extend efficient mental strategies
- Add and subtract mentally a 'near multiple of 10' to or from a two-digit number by adding or subtracting 10, 20, 30 and adjusting the answer
- Understand corresponding subtraction and addition
- Use number facts and place value to add/subtract mentally
- Bridge through a multiple of 10 and adjust the answer
- Be able to multiply by 10/100 by shifting digits one/two places to the left
- Check subtraction with addition, halving with doubling and division with multiplication
- Check with an equivalent calculation

Stage 3: Problem Solving

Pupils should:

- Choose and use appropriate operations and strategies to solve problems, including multiplication and division
- Solve simple problems or puzzles, and generalise and predict from simple patterns and relationships
- Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it
- Explain methods and reasoning orally and in writing
- Solve simple problems set in 'real-life' contexts such as money and measures, using mental addition and subtraction, and use simple multiplication and division to solve simple word problems using one or more steps and explain the method used
- Recognise coins and notes of different values and use notation for money
- Find totals and change from 20 cents
- Find totals, give change and work out how to pay an exact sum using smaller coins
- Check that answers are reasonable

Stage 3: Organising and Using Data

Pupils should:

- Organise and interpret data using simple frequency tables, pictograms (symbol for two units), bar charts (intervals in ones then twos), Venn and Carroll diagrams (one criterion)
- Explain methods and reasoning

Stage 3: Shape, Space and Measures

Patterns and Properties of Shape

Pupils should:

- Classify and describe 2-D and 3-D shapes and refer to some of their features such as reflective symmetry, vertices, right angles
- Make and describe shapes, pictures and patterns and relate solid shapes to pictures of them
- Recognise lines of symmetry in simple shapes

Properties of Position and Movement

Pupils should:

- Describe and find the position of a square on a grid of squares with rows and columns labelled
- Recognise and use the four compass directions N, S, E and W
- Identify, make and describe right angles and right-angle turns

Measures

Pupils should:

- Measure and compare using standard units
- Use a ruler to draw and measure to the nearest half centimetre
- Know relationships between metric measurements
- Select units and equipment to measure length, mass, capacity
- Read scales to the nearest division (labelled or unlabelled)
- Use and read vocabulary related to time
- Use units of time and understand relationships between them
- Use a calendar
- Read the time to 5 minutes on an analogue clock and a 12-hour digital clock and use the notation 9:40

Stage 4: Number

Numbers and the Number System

Pupils should:

- Read and write whole numbers to at least 10,000 in figures and words and know what each digit represents
- Add/subtract 1, 10, 100 or 1,000 to/from any integer and count on or back in tens, hundreds or thousands from any whole number up to 10,000
- Multiply or divide any integer up to 1,000 by 10 and understand the effect
- Begin to multiply by 100
- Compare and order numbers using symbols <, >, =
- Make and justify estimates up to 250 and estimate a proportion
- Round any positive integer less than 1,000 to the nearest 10 or 100
- Recognise negative numbers in context (e.g. temperature scale)
- Extend number sequences into negative numbers
- Recognise odd and even numbers up to 1,000 and understand some of their properties
- Recognise multiples of 2, 3, 4, 5 and 10 up to the tenth multiple
- Recognise unit fractions and use them to find fractions of shapes and numbers
- Recognise simple fractions that are several parts of the whole, mixed numbers and simple equivalent fractions
- Order simple fractions and find fractions of shapes
- Begin to use ideas of simple proportion
- Understand decimal notation and place value for tenths and hundredths and use in context
- Recognise the equivalence between the decimal and fraction forms of one half and one quarter, and tenths such as 0.3

Calculations

Pupils should:

- Consolidate understanding of relationship between addition and subtraction
- Know by heart addition and subtraction facts for all numbers to 20
- Calculate quickly all pairs of numbers that total 100, and pairs of multiples of 50 with a total of 1,000
- Develop written methods for column addition and subtraction of two whole numbers less than 1,000 and addition of more than two such numbers
- Extend understanding of operations of multiplication and division
- Find remainders after division
- Round up or down after division
- Know the 2, 3, 4, 5 and 10 times tables
- Begin to know the 6, 7, 8 and 9 times tables
- Calculate quickly division facts from known tables

- Know doubles of whole numbers up to 50
- Know doubles of multiples of 10 to 500
- Know doubles of multiples of 100 to 5,000
- Approximate first and develop written methods
- Check with inverse operation, by adding in a different order and with an equivalent calculation
- Estimate and check by approximating to the nearest 10 or 100
- Use knowledge of sums or differences of odd/even numbers

Mental Skills

Pupils should:

- Develop mental calculation strategies for addition and subtraction
- Add 3 or 4 small numbers, finding pairs that total 9, 10 or 11
- Add three two-digit multiples of 10
- Add or subtract any pair of two-digit whole numbers
- Use doubling and halving (e.g. to multiply by 5, multiply by 10 and then halve)
- Use relationship between x and y
- Use known facts and place value to multiply and divide integers

Stage 4: Problem Solving

Pupils should:

- Choose and use appropriate number operations and ways of calculating to solve problems
- Solve mathematical puzzles or problems, recognise and explain patterns and relationships, generalise and predict
- Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it
- Explain methods and reasoning orally and in writing
- Use the four operations to solve problems involving numbers in 'real life', using one or more steps
- Check that answers are reasonable


4
+1
4
+2
6
4
+3
7
5
+3

Stage 4: Organising and Using Data

Pupils should:

- Collect, organise, represent and interpret data in tables, charts, graphs and diagrams
- Use tally charts and frequency tables
- Use pictograms (symbol for 2, 5, 10 or 20 units)
- Use bar charts (intervals in twos, fives, tens or twenties)
- Use Venn and Carroll diagrams (two criteria)

Stage 4: Shape, Space and Measures

Patterns and Properties of Shape

Pupils should:

- Describe and visualise 2-D and 3-D shapes
- Recognise equilateral and isosceles triangles
- Classify polygons as regular, symmetrical or right-angled
- Make shapes and identify simple nets of solid shapes
- Understand reflection of simple shapes

Properties of Position and Movement

Pupils should:

- Recognise positions and directions
- Describe and find the point on a grid of squares where the lines are numbered
- Recognise horizontal and vertical lines
- Use eight compass directions, N, S, E, W, NE, NW, SE, SW
- Make and measure clockwise and anti-clockwise turns
- Begin to know that angles are measured in degrees
- Know that one whole turn is 360° or four right-angles
- Know that a quarter turn is 90° or one right-angle
- Know that half a right-angle is 45°
- Start to order a set of angles less than 180°

Measures

Pupils should:

- Use, read and write standard metric units including abbreviations
- Know and use the relationships between familiar units of length, mass and capacity
- Select units and equipment to measure length, mass, capacity
- Record estimates and take accurate readings from scales
- Measure and calculate perimeter and area of simple shapes by counting and use standard units
- Estimate and check times using seconds, minutes, hours
- Read from a digital and analogue clock to the nearest minute
- Use a.m. and p.m. notation
- Read simple timetables and use a calendar

Stage 5: Number

Numbers and the Number System

Pupils should:

- Read and write whole numbers in figures and words and know what each digit represents
- Multiply and divide any positive integer up to 10,000 by 10 or 100
- Compare and order numbers using symbols <, >, = and order a set of integers less than 1 million
- Estimate and approximate using large numbers and simple proportions
- Round any integer up to 10,000 to the nearest 10, 100 or 1,000
- Order a given set of positive and negative integers
- Recognise and extend number sequences
- Make general statements about odd and even numbers
- Recognise multiples of 6, 7, 8 and 9, up to the tenth multiple
- Know tests of divisibility by 2, 4, 5, 10 or 100
- Know squares of numbers to at least 10 x 10
- Find all pairs of factors of any number up to 100
- Use fraction notation including mixed numbers
- Change an improper fraction to a mixed number and recognise equivalent fractions
- Order a set of fractions including mixed numbers
- Use division to find simple fractions of numbers and quantities
- Solve simple problems using ratio and proportion
- Use decimal notation for tenths and hundredths
- Round a number with one or two decimal places to the nearest integer
- Relate fractions to their decimal equivalents
- Begin to understand percentages as the number of parts in every hundred
- Find simple percentages of whole number quantities
- Express simple fractions as percentages

Calculations

Pupils should:

- Calculate quickly decimals that total 1, all two-digit pairs that total 100, all pairs of multiples of 50 with a total of 1,000
- Use written methods for column addition/subtraction of two integers less than 10,000
- Add more than two integers of less than 10,000
- Add/subtract a pair of decimal fractions with one or two decimal places
- Understand the relationships between the four operations
- Begin to use brackets
- Begin to express a quotient as a fraction or as a decimal when dividing a whole number by 2, 4, 5 or 10
- Round up or down after division
- Know multiplication facts up to 10 x 10

- Calculate quickly division facts from tables up to 10 x 10, doubles of whole numbers from 1 to 100, doubles of multiples of 10 to 1,000, doubles of multiples of 100 to 10,000
- Approximate first
- Extend written methods to three-digit numbers by one digit using short multiplication, two-digit numbers by two-digit numbers using long multiplication and short division of three-digit numbers by one digit with remainder
- Use a calculator effectively and check with inverse operation when using a calculator
- Check sum of several numbers by adding in reverse order and check with equivalent calculation
- Estimate by approximating and check result
- Use knowledge of sums and differences of odd/even numbers

Mental Skills

Pupils should:

- Find differences by counting up through next multiple of 10, 100 or 1,000
- Add/subtract the nearest multiple of 10 or 100, then adjust
- Add several numbers using number facts and place value for mental addition and subtraction
- Use doubling and halving from known facts
- Use factors and closely related facts
- Partition, like 47 x 6 = (40 x 6) + (7 x 6)
- Use the relationship between multiplication and division and use facts and place value to multiply and divide mentally

Stage 5: Problem Solving

Pupils should:

- Choose and use appropriate number operations and ways of calculating to solve problems
- Solve mathematical puzzles or problems, recognise and explain patterns and relationships, generalise and predict
- Make and investigate a general statement about familiar numbers or shapes by finding examples that satisfy it
- Explain a generalised relationship (formula) in words
- Explain methods and reasoning orally and in writing
- Use the four operations to solve problems involving numbers in 'real life', using one or more steps including finding simple percentages
- Check that answers are reasonable

Stage 5: Organising and Using Data

Pupils should:

- Discuss the chance of particular events
- Solve a problem by using data in tables, charts, graphs and diagrams including those generated by a computer
- Use bar line charts, vertical axes labelled in twos, fives, tens, twenties or hundreds
- Find the mode of a set of data

Stage 5: Shape, Space and Measures

Patterns and Properties of Shape

Pupils should:

- Recognise properties of rectangles and classify triangles
- Make shapes accurately and identify nets for an open cube
- Recognise reflective symmetry in regular polygons
- Complete symmetrical patterns and recognise where a shape will be after reflection in a mirror line
- Recognise where a shape will be after translation

Properties of Position and Movement

Pupils should:

- Read and plot co-ordinates in the first quadrant
- Recognise perpendicular and parallel lines
- Understand and use angle measures in degrees
- Identify, estimate and order acute and obtuse angles
- Use a protractor to measure and draw acute and obtuse angles to the nearest 5°
- Calculate angles in a straight line

Measures

Pupils should:

- Use, read and write standard metric units including abbreviations
- Convert larger to smaller units
- Know and use the relationships between familiar units of length, mass and capacity
- Select units and equipment to measure length, mass, capacity
- Measure and draw lines to the nearest millimetre
- Record estimates and take accurate readings from scales
- Understand area measured in square centimetres and length x breadth for area of a rectangle
- Understand, measure and calculate perimeters of rectangles and regular polygons
- Understand and use formulae in words
- Use units of time and read time on a 24-hour digital clock using 24-hour clock notation 19:53

Stage 6: Number

Numbers and the Number System

Pupils should:

- Multiply and divide decimals mentally by 10 or 100 and integers by 1,000
- Round an integer to the nearest 10, 100 or 1,000
- Find the difference between two negative numbers or between a positive and a negative integer in context and order a set of positive and negative integers
- Recognise and extend number sequences
- Make statements about odd and even numbers including the outcome of products
- Recognise multiples up to 10 x 10, know and apply tests of divisibility and find simple common multiples
- Recognise squares of numbers to 12 x 12
- Recognise prime numbers to at least 20
- Factorise numbers to 100 into prime factors
- Change an improper fraction to a mixed number and vice versa
- Recognise relationships between fractions and reduce a fraction to its simplest form
- Order fractions by converting to a common denominator
- Solve simple problems using proportion and ratio
- Use decimal notation for tenths, hundredths and thousandths
- Order a mixed set of numbers with up to three decimal places
- Round a number with two decimal places to the nearest tenth or whole number
- Recognise the equivalence between decimal and fraction forms
- Begin to convert a fraction to a decimal using division
- Understand percentages as the number of parts in every 100 and express simple fractions as percentages
- Find simple percentages of small whole number quantities

Calculations

Pupils should:

- Extend written methods to column addition and subtraction of numbers including decimals
- Understand the relationships between the four operations and use brackets
- Express a quotient as a fraction or as a decimal rounded to one decimal place
- Round up or down after division
- Know multiplication facts to 10 x 10
- Calculate quickly division facts of tables to 10 x 10, squares of multiples of 10 to 100, doubles of two-digit numbers, doubles of multiples of 10 to 1,000, doubles of multiples of 100 to 10,000
- Approximate first
- Extend written methods to four-digit numbers by one digit using short multiplication, short multiplication involving decimals, long multiplication of a three-digit number by a two-digit integer and short division involving numbers with decimals

- Develop calculator skills and use a calculator effectively
- Check results by using the inverse operation when using a calculator
- Check the sum of numbers by adding in reverse order
- Check with an equivalent calculation
- Estimate by approximating and check the result
- Use knowledge of sums, differences, products of odd/even numbers and tests of divisibility

Mental Skills

Pupils should:

- Consolidate all learned strategies
- Use known facts and place value to consolidate mental strategies for addition/subtraction
- Use related facts, doubling or halving and use factors and closely related facts and partition
- Use the relationship between multiplication and division
- Use known number facts and place value to consolidate mental multiplication and division

Stage 6: Problem Solving

Pupils should:

- Choose and use appropriate number operations and ways of calculating to solve problems
- Solve mathematical puzzles or problems, recognise and explain patterns and relationships, generalise and predict
- Make and investigate a general statement about familiar numbers or shapes by finding examples that satisfy it
- Develop from explaining a generalised relationship in words to expressing it in a formula using letters as symbols
- Explain methods and reasoning orally and in writing
- Use the four operations and combinations of operations to solve problems involving numbers in 'real life', using one or more steps including finding simple percentages
- Check that answers are reasonable

Stage 6: Organising and Using Data

Pupils should:

- Use the language of probability
- Solve a problem by using data in tables, graphs, charts and diagrams including those generated by a computer
- Use line graphs, frequency tables and bar charts with grouped discrete data
- Find the mode and range of a set of data
- Begin to find the median and mean of a set of data

Stage 6: Shape, Space and Measures

Patterns and Properties of Shapes

Pupils should:

- Describe and visualise properties of solid shapes and classify quadrilaterals
- Make shapes with increasing accuracy
- Visualise 3-D shapes from 2-D drawings and identify nets for a closed shape
- Understand reflection

Properties of Position and Movement

Pupils should:

- Read and plot co-ordinates in all four quadrants
- Recognise and estimate angles
- Use a protractor to measure and draw acute and obtuse angles to the nearest degree
- Check that the sum of angles in a triangle is 180°
- Calculate angles in a triangle or around a point
- Recognise where a shape will be after a rotation through 90° about one of its vertices

Measures

Pupils should:

- Use, read and write standard metric units including abbreviations and understand relationships between them
- Convert larger to smaller units and vice versa
- Know and use the relationships between familiar units of length, mass and capacity
- Select units and equipment to estimate or measure length, mass and capacity
- Record estimates and take accurate readings from scales
- Calculate the perimeter and area of simple compound shapes that can be split into rectangles
- Appreciate different times around the world

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