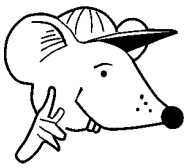


MATHEMATICS

Programme of Study

Year 6 Number and Place Value

Here are the statutory requirements:

Number and place value

Pupils should be taught to:

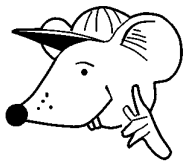
- read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
- round any whole number to a required degree of accuracy
- use negative numbers in context, and calculate intervals across zero
- solve number and practical problems that involve all of the above.

Below is a list of MathSphere modules covering the above requirements.

Number and place value
(43 pages including titles, concepts and answers)

1. Read and write very large numbers. (5 pages)
2. Revise rounding whole numbers. (12 pages)
3. Recognise and order negative numbers. (17 pages)
4. Revise estimating and approximating. (9 pages)

Programme of Study



Year 6 Addition, Subtraction, Multiplication and Division

Here are the statutory requirements:

Year 6 Addition, Subtraction, Multiplication and Division

Pupils should be taught to:

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- perform mental calculations, including with mixed operations and large numbers.
- identify common factors, common multiples and prime numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Below is a list of MathSphere modules covering the above requirements.

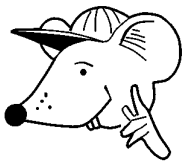
Addition, Subtraction, Multiplication and Division
(209 pages including titles, concepts and answers)

1. Revise addition. (16 pages)
2. Revise subtraction. (12 pages)
3. Use known number facts to add and subtract decimals. (11 pages)

Addition, Subtraction, Multiplication and Division (continued)

4. Relationship between addition and subtraction. Add several numbers. (14 pages)
5. Revise multiplication. (13 pages)
6. Use known facts to multiply mentally. (19 pages)
7. Revise division. (12 pages)
8. Revise doubling and halving. Using factors. (14 pages)
9. Square numbers, prime numbers and identifying factors. (15 pages)
10. Use formal written methods of addition. (10 pages)
11. Use formal written methods of subtraction. (16 pages)
12. Use formal written methods of multiplication. (6 pages)
13. Long multiplication. (8 pages)
14. Use formal written methods of long division. (5 pages)
15. More long division: 3-digits divided by 2-digit numbers. (8 pages)
16. Division with decimals. (8 pages)
17. Multiples, factors and tests of divisibility. (12 pages)
18. Conventions for working out expressions. (Bodmas) (10 pages)

Programme of Study



Year 6 Fractions (including decimals and percentages)

Here are the statutory requirements:

Fractions (including decimals and percentages)

Pupils should be taught to:

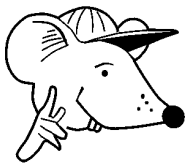
- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions >1
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $^1/_4 \times {}^1/_2 = {}^1/_8$)
- divide proper fractions by whole numbers ($^1/_3 \div 2 = {}^1/_6$)
- associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$)
- identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
- multiply one-digit numbers with up to two decimal places by whole numbers
- use written division methods in cases where the answer has up to two decimal places
- solve problems which require answers to be rounded to specified degrees of accuracy
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

On the next page is a list of MathSphere modules covering the above requirements.

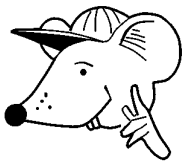
Fractions (including decimals and percentages)

(149 pages including titles, concepts and answers)

1. Use fraction notation. Recognise equivalent fractions. (22 pages)
2. Find fractions of numbers or quantities. (9 pages)
3. Adding fractions. (8 pages)
4. Fraction investigation 1. (3 pages)
5. Investigate halves. (3 pages)
6. Subtracting fractions. (12 pages)
7. Multiplying and dividing fractions. (7 pages)
8. Use decimal notation. Order decimal fractions. (14 pages)
9. Round decimals. Equivalence between decimals and fractions. (28 pages)
10. Use known facts to multiply and divide decimals. (14 pages)
11. Understand remainders. Round up or down. (17 pages)
12. Percentages. (12 pages)



Programme of Study



Year 6 Ratio and Proportion

Here are the statutory requirements:

Ratio and Proportion

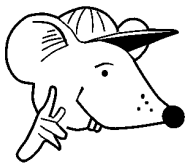
Pupils should be taught to:

- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
- solve problems involving the calculation of percentages (e.g. of measures) such as 15% of 360 and the use of percentages for comparison
- solve problems involving similar shapes where the scale factor is known or can be found
- solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

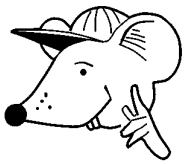
Below is a list of MathSphere modules covering the above requirements.

Ratio and Proportion
(53 pages including titles, concepts and answers)

1. Begin to understand ratio and proportion. (11 pages)
2. Solve problems concerning ratio and proportion. (9 pages)
3. Ratio and proportion problems. (12 pages)
4. Scale/Proportion/Conversion of units. (13 pages)
5. Scale drawing. (8 pages)



Programme of Study



Year 6 Algebra

Here are the statutory requirements:

Algebra

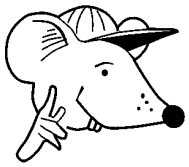
Pupils should be taught to:

- express missing number problems algebraically
- use simple formulae expressed in words
- generate and describe linear number sequences
- find pairs of numbers that satisfy number sentences involving two unknowns
- enumerate all possibilities of combinations of two variables.

Below is a list of MathSphere modules covering the above requirements.

Algebra
(52 pages including titles, concepts and answers)

1. Make and investigate general statements. (13 pages)
2. Extend number sequences. (12 pages)
3. Algebra. (24 pages)
4. Algebra investigation. (3 pages)



Programme of Study

Year 6 Measurement

Here are the statutory requirements:

Measurement

Pupils should be taught to:

- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
- use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
- convert between miles and kilometres
- recognise that shapes with the same areas can have different perimeters and vice versa
- recognise when it is possible to use formulae for area and volume of shapes
- calculate the area of parallelograms and triangles
- calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3.

Below is a list of MathSphere modules covering the above requirements.

Measurement
(93 pages including titles, concepts and answers)

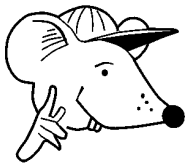
1. Use standard metric units and convert. (8 pages)
2. Units to estimate and measure length, mass and capacity. (8 pages)
3. Solve measurement problems. (7 pages)
4. Read scales, record estimates and measure. (14 pages)
5. Measure and calculate the perimeter and area of simple shapes. (15 pages)

Measurement (continued)

6. More perimeter and area. (25 pages)

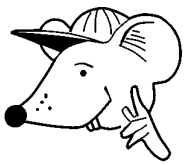
7. Measure and calculate the circumference of circles. (11 pages)

8. Farmer's field investigation. (5 pages)



Programme of Study

Year 6 Geometry



Here are the statutory requirements:

Geometry

Properties of shapes

Pupils should be taught to:

- draw 2-D shapes using given dimensions and angles
- recognise, describe and build simple 3-D shapes, including making nets
- compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
- illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
- recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

Position and direction

Pupils should be taught to:

- describe positions on the full coordinate grid (all four quadrants)
- draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

Below is a list of MathSphere modules covering the above requirements.

Geometry
(86 pages including titles, concepts and answers)

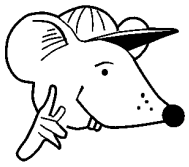
1. Visualise, describe and classify 3-D and 2-D shapes. (8 pages)
2. More shapes and nets. (11 pages)
3. More measuring angle. (16 pages)
4. Investigate exterior and interior angles. (6 pages)

Geometry (continued)

5. More properties of shapes. (16 pages)

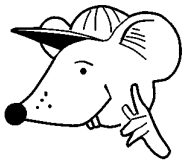
6. Reflective symmetry. Reflections and translations. (16 pages)

7. Use co-ordinates and extend to four quadrants. (13 pages)



Programme of Study

Year 6 Statistics



Here are the statutory requirements:

Statistics

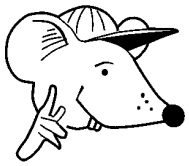
Pupils should be taught to:

- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average.

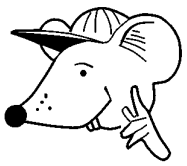
Below is a list of MathSphere modules covering the above requirements.

Statistics
(37 pages including titles, concepts and answers)

1. Collect, sort and organise data. Pie charts. (11 pages)
2. Further data handling. (11 pages)
3. Probability. (9 pages)
4. Investigate measurement statistics. (6 pages)



Non statutory mathematics



Year 6 Using and Applying Mathematics

Below is a list of MathSphere modules covering Using and Applying Mathematics:
(105 pages including titles, concepts and answers where appropriate)

1. Solve problems involving 'real life'. (8 pages)
2. Solve problems involving money. (8 pages)
3. Solve problems involving time. (8 pages)
4. More time problems. (8 pages)
5. Choose appropriate methods of calculating. (11 pages)
6. Explain methods and reasoning. (7 pages)
7. Solve problems, generalise and predict. (11 pages)
8. Checking results of calculations. (11 pages)
9. Develop calculator skills. (9 pages)
10. Calculator fractions. (3 pages)
11. Maths vocabulary games. (8 pages)
12. Investigate factors and primes. (7 pages)
13. Investigate four fours. (3 pages)
14. Primes from squares. (3 pages)