Number and place value:

- read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
  - read and write numbers up to *100 000* and determine the value of each digit A1
  - read and write numbers up to *1 000 000* and determine the value of each digit A2
  - read and write numbers up to 10 000 000 and determine the value of each digit A3
  - order and compare numbers to *100 000* A1
  - order and compare numbers to *1 000 000* A2
  - order and compare numbers up to 10 000 000 A3
- round any whole number to a required degree of accuracy
  - round any whole number to a required degree of accuracy A1/A2/A3/C1/C2/C3
- use negative numbers in context, and calculate intervals across zero
  - *find the difference between two negative numbers A1/B1*
  - calculate intervals across zero A2/B2
  - use negative numbers in context and calculate intervals across zero A3/B3
  - *use the number line to add and subtract positive and negative integers for measures such as temperature E3*
- solve number and practical problems that involve all of the above
  - solve number and practical problems A1/A2/A3

Addition, subtraction, multiplication and division:

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
  - multiply multi-digit numbers up to 4-digits by a two-digit whole number using the formal written method of long multiplication C1
- 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
  - 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 C2/3
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
  - divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate, interpreting remainders according to the context C1
- perform mental calculations, including with mixed operations and large numbers
  - perform mental calculations including with mixed operations A1
  - perform mental calculations including with mixed operations and *increasingly* large numbers A2
  - perform mental calculations including with mixed operations and large numbers A3
- identify common factors, common multiples and prime numbers
  - identify common factors of *two numbers* and *know what a prime number is* A1
  - identify common multiples of *two numbers* and *know some prime numbers* A2
  - identify common factors, common multiples and prime numbers A3
- use their knowledge of the order of operations to carry out calculations involving the four operations
  - *understand the purpose of brackets in a number sentence A1*
  - *use brackets in a number sentence for addition and subtraction A2*
  - use my knowledge of the order of operations to carry out calculations involving the four operations *(e.g. 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9 A3*
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
  - solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why C1/C2/C3
- solve problems involving addition, subtraction, multiplication and division
  - solve *mental* problems involving addition, subtraction, multiplication and division A1/A2/A3
  - solve problems involving addition, subtraction, multiplication and division C1/C2/C3
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
  - use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy C1/C2/C3
  - *use rounding and estimating to support my calculations D1/D3*
  - *estimate to check if my answers are sensible E1/E2/E3*

Fractions (including decimals and percentages)

- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
  - use common factors to simplify fractions D1/D3
  - use common multiples to express fractions in the same denomination D2/D3
- compare and order fractions, including fractions > 1
  - compare and order fractions *up to one* A1/D1
  - compare and order fractions, including fractions greater than 1 A2/A3/D2/D3
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
  - *use a variety of images, diagrams and drawings to represent calculations with fractions D1/D2/D3*
  - add and subtract *two* fractions with different denominators using the concept of equivalent fractions D1
  - add and subtract *up to three* fractions with different denominators using the concept of equivalent fractions D2
  - add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions D3
- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
  - *use a variety of images, diagrams and drawing to represent calculations with fractions D1/D2/D3*

- ➢ multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$) D1/D3
- divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]
  - ➢ *use a variety of images, diagrams and drawing to represent calculations with fractions (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$) D2/D3*
  - ➢ divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$) D2/D3
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]
  - ➢ associate a fraction with division & calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) D3
- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
  - ➢ identify the value of each digit to three decimal places & multiply & divide numbers by 10, 100 and 100 giving the answers up to three decimal places A1
  - ➢ *use decimal notation up to three decimal places where appropriate E1*
- multiply one-digit numbers with up to two decimal places by whole numbers
  - ➢ multiply one-digit numbers with up to two decimal places by whole numbers C2
- use written division methods in cases where the answer has up to two decimal places
  - ➢ use written division methods in cases where the answer has up to two decimal places C3
- solve problems which require answers to be rounded to specified degrees of accuracy
  - ➢ solve problems which require answers to be rounded to specified degrees of accuracy D1/D2/D3
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
  - ➢ *quickly name sets of equivalent fractions D2/D3*
  - ➢ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts D1/D2/D3
  - ➢ *work backwards from a problem (e.g. if ¼ of a length is 36cm, then the whole length is 36 x 4 = 144cm D3*

Ratio and proportion

- 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 relative sizes of two quantities where missing values can be found by using integer multiplication & division facts D1
- solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
  - ➢ solve problems involving the calculation of percentages (e.g. of measures) such as 15% of 360 D1
  - ➢ solve problems involving the calculation of percentages (e.g. of measures) such as 15% of 360 and the use of percentages for comparison D2
  - ➢ solve problems involving the calculation of *increasingly complex* percentages (e.g. of measures) such as 15% of 360 and the use of percentages for comparison D3
- solve problems involving similar shapes where the scale factor is known or can be found
  - ➢ solve problems involving *recipes* and similar shapes where the scale factor is known or can be found D2
- solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
  - ➢ solve problems involving unequal grouping and sharing using knowledge of fractions and multiples *using the notation a:b and the language 'for every…'. D3*

Algebra

- use simple formulae
  - ➢ use simple formulae C1/C2/C3
- generate and describe linear number sequences
  - ➢ generate *simple* linear number sequences C1/C2
  - ➢ generate and describe linear number sequences C3
- express missing number problems algebraically
  - ➢ *understand that symbols represent unknowns in number sentences (e.g. * + 3 = 6) A1*
  - ➢ *use symbols and letters to solve missing number problems A2*
  - ➢ express missing number problems algebraically A3
- find pairs of numbers that satisfy an equation with two unknowns
  - ➢ find pairs of numbers that satisfy number sentences involving two unknowns C2
- enumerate possibilities of combinations of two variables
  - ➢ enumerate all possibilities of combinations of two variables C3

Measurement

- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
  - ➢ solve problems involving the calculation and conversion of units of measure E1
  - ➢ solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate E2/E3
- 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
  - ➢ use, read and write standard units E1/E2/E3
  - ➢ 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 E1
  - ➢ 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 up to three decimal places E2
- convert between miles and kilometres

- convert between miles and kilometres E3
- *understand and use some compound measures for speed such as miles per hour E3*
- *solve problems involving the connection between conversion from miles to kilometres in measurement and to its graphical representation E3*
- recognise that shapes with the same areas can have different perimeters and vice versa
    - recognise that shapes with the same areas can have different perimeters and vice versa E1
- recognise when it is possible to use formulae for area and volume of shapes
    - recognise when it is possible to use formulae for area of shapes E1
    - recognise when it is possible to use formulae for volume of shapes E2
- calculate the area of parallelograms and triangles
    - calculate the area of parallelograms and triangles E1
- calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]
    - calculate, estimate and compare volumes of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]E2

Properties of shape

- draw 2-D shapes using given dimensions and angles
    - draw 2-D shapes using given dimensions and angles B1
- recognise, describe and build simple 3-D shapes, including making nets
    - recognise, describe and build simple 3-D shapes, including making nets, *drawing the nets accurately using measuring tools B2*
- compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
    - compare and classify geometric shapes based on their properties and sizes B1/B2/B3
    - find unknown angles in any triangles and quadrilaterals B1
    - find unknown angles in any triangles, quadrilaterals and regular polygons B2/B3
    - *express relationships between angles and shapes algebraically e.g. a = 180 – (b + c) B1/B2*
    - *express relationships between angles and shapes algebraically e.g. d = 2 x r B3*
    - *describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements B1/B2/B3*
- illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
    - illustrate and name parts of circles, including radius, diameter and circumference B3
    - know that the diameter of a circle is twice the radius B3
- recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
    - recognise angles where they meet at a point, are on a straight line and find missing angles B1/B2
    - recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles B3

Position and direction

- describe positions on the full coordinate grid (all four quadrants)
    - describe positions on the full coordinate grid (all four quadrants) B1
    - *draw and label a pair of axes in all four quadrants with equal scaling B1*
- draw and translate simple shapes on the coordinate plane, and reflect them in the axes
    - *draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in all four quadrants, predicting missing coordinates using the properties of shapes B1/B2/B3*
    - draw and translate simple shapes on the coordinate plane, and reflect them in the axes B2
    - *translate shapes using algebraic notation e.g. translating vertex (a, b) to (a-2, b+3); (a, b) and (a+d, b+d) being opposite vertices of a square) B3*

Statistics

- interpret and construct pie charts and line graphs and use these to solve problems
    - *draw graphs relating two variables, arising from my own enquiry and in other subjects E1*
    - construct line graphs and use them to solve problems E1
    - interpret line graphs and use them to solve problems E1
    - *use angles, fractions and percentages to help me interpret pie charts E2*
    - construct pie charts and line graphs and use them to solve problems E2
    - interpret pie charts and line graphs and use them to solve problems E2
- calculate and interpret the mean as an average
    - calculate the mean as an average E3
    - interpret the mean as an average E3
    - *know when it is appropriate to find the mean of a set of data E3*