Additive Reasoning Multiplicative Reasoning Geometric Reasoning YEAR 6 • read, write, order and compare numbers up to 10 000 000 and · use, read, write and convert between standard units, converting determine the value of each digit measurements of length, mass and time from a smaller unit of round any whole number to a required degree of accuracy measure to a larger unit, and vice versa, using decimal notation Sequence to up to three decimal places · solve number and practical problems that involve all of the above · convert between miles and kilometres • 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 perform mental calculations, including with mixed operations and · express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns · use their knowledge of the order of operations to carry out · enumerate possibilities of combinations of two variables calculations involving the four operations solve problems involving the calculation and conversion of units · solve addition and subtraction multi-step problems in contexts, of measure, using decimal notation to three decimal places Sequence deciding which operations and methods to use and why where appropriate · solve problems involving addition and subtraction • use, read, write and convert between standard units, converting • use estimation to check answers to calculations and determine, measurements of length, mass and time from a smaller unit of in the context of a problem, an appropriate degree of accuracy measure to a larger unit, and vice versa, using decimal notation to up to three decimal places · solve problems which require answers to be rounded to specified interpret and construct pie charts and line graphs and use these degrees of accuracy to solve problems · use simple formulae • generate and describe linear number sequences solve problems involving the calculation of percentages [for multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication example, of measures, and such as 15% of 360] and the use of percentages for comparison divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret use simple formulae remainders as whole number remainders, fractions, or by generate and describe linear number sequences rounding, as appropriate for the context · express missing number problems algebraically · divide numbers up to 4 digits by a two-digit number using the find pairs of numbers that satisfy an equation with two unknowns formal written method of short division where appropriate, · enumerate possibilities of combinations of two variables interpreting remainders according to the context • solve problems involving the calculation and conversion of units • perform mental calculations, including with mixed operations Sequence of measure, using decimal notation to three decimal places and large numbers · identify common factors, common multiples and prime numbers • use, read, write and convert between standard units, converting • use their knowledge of the order of operations to carry out measurements of length, mass and time from a smaller unit of calculations involving the four operations measure to a larger unit, and vice versa, using decimal notation · solve problems involving addition, subtraction, multiplication and to up to three decimal places · interpret and construct pie charts and line graphs and use these · use estimation to check answers to calculations and determine, to solve problems in the context of a problem, an appropriate degree of accuracy · calculate and interpret the mean as an average · multiply one-digit numbers with up to two decimal places by · use written division methods in cases where the answer has up to two decimal places • draw 2-D shapes using given dimensions and angles use simple formulae recognise, describe and build simple 3-D shapes, including express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns · compare and classify geometric shapes based on their Sequence · enumerate possibilities of combinations of two variables properties and sizes and find unknown angles in any triangles, • recognise that shapes with the same areas can have different quadrilaterals, and regular polygons perimeters and vice versa · illustrate and name parts of circles, including radius, diameter • calculate the area of parallelograms and triangles 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

· recognise when it is possible to use the formulae for area and

volume of shapes

KEY Number Sense Additive Reasoning Multiplicative Reasoning Geometric Reasoning

Sequence 5

- 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
- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving the answers up to three decimal places
- use, read, write and convert between standard units, converting measurements of length, mass and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places

Sequence

6

- use negative numbers in context, and calculate intervals across zero
- perform mental calculations, including with mixed operations and large 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 and subtraction
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
- solve problems which require answers to be rounded to specified degrees of accuracy
- · use simple formulae

- generate and describe linear number sequences
- express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables
- solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate
- use, read, write and convert between standard units, converting measurements of length, mass and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
- interpret and construct pie charts and line graphs and use these to solve problems

Sequence

- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions >1
- associate a fraction with division and calculate decimal fraction equivalents [for example 0.375] for a simple fraction [for example $\frac{3}{8}$]
- recall and use equivalences between simple fractions, decimals and percentages, including in different context
- 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 to three decimal places
- use simple formulae
- generate and describe linear number sequences
- express missing number problems algebraically

- find pairs of numbers that satisfy an equation with two
 unknowns
- solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate
- use, read, write and convert between standard units, converting measurements of length, mass and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to three decimal places
- interpret and construct pie charts and line graphs and use these to solve problems

KEY Number Sense Additive Reasoning Multiplicative Reasoning Geometric Reasoning

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

- 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 number using the formal written method of short division where appropriate, interpreting remainders according to 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 problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
- 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 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 relative sizes of two quantities, where missing values can be found by using integer multiplication and division facts
- solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

- use simple formulae
- generate and describe linear number sequences
- · express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables
- solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate
- use, read, write and convert between standard units, converting measurements of length, mass and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to three decimal places
- · convert between miles and kilometres
- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average

Sequence

Sequence

9

- 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
- 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
- use simple formulae

- express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables
- calculate the area of parallelograms and triangles
- recognise when it is possible to use the formulae for area and volume of shapes
- 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]
- solve problems involving similar shapes where the scale factor is known or can be found

Sequence

10

- 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
- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions >1
- 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
- use, read, write and convert between standard units, converting measurements of length, mass 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

Additive Reasoning Multiplicative Reasoning

· perform mental calculations, including with mixed operations • use, read, write and convert between standard units, converting and large numbers • use their knowledge of the order of operations to carry out to up to three decimal places calculations involving the four operations solve addition and subtraction multi-step problems in contexts, to solve problems deciding which operations and methods to use and why · calculate and interpret the mean as an average solve problems involving addition, subtraction, multiplication use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy Sequence add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions solve problems which require answers to be rounded to specified degrees of accuracy • use simple formulae generate and describe linear number sequences express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate · use common factors to simplify fractions; use common multiples generate and describe linear number sequences to express fractions in the same denomination express missing number problems algebraically • compare and order fractions, including fractions >1 find pairs of numbers that satisfy an equation with two unknowns • associate a fraction with division and calculate decimal fraction solve problems involving the calculation and conversion of units equivalents [for example, 0.375] for a simple fraction Sequence of measure, using decimal notation to three decimal places [for example \(^3\)\] where appropriate 12 • recall and use equivalences between simple fractions, decimals use, read, write and convert between standard units, converting and percentages, including in different contexts measurements of length, mass and time from a smaller unit of identify the value of each digit in numbers given to three measure to a larger unit, and vice versa, using decimal notation decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places to three decimal places interpret and construct pie charts and line graphs and use these • use simple formulae to solve problems • multiply multi-digit numbers up to 4 digits by a two-digit whole solve problems involving the relative sizes of two quantities, number using the formal written method of long multiplication where missing values can be found by using multiplication and division facts • divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret solve problems involving unequal sharing and grouping using remainders as whole number remainders, fractions, or by knowledge of fractions and multiples rounding, as appropriate for the context use simple formulae • divide numbers up to 4 digits by a two-digit number using the generate and describe linear number sequences formal written method of short division where appropriate, express missing number problems algebraically interpreting remainders according to the context find pairs of numbers that satisfy an equation with two unknowns perform mental calculations, including with mixed operations enumerate possibilities of combinations of two variables and large numbers solve problems involving the calculation and conversion of units • identify common factors, common multiples and prime numbers of measure, using decimal notation to three decimal places • use their knowledge of the order of operations to carry out where appropriate Sequence calculations involving the four operations use, read, write and convert between standard units, converting solve problems involving addition, subtraction, multiplication measurements of length, mass and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation use estimation to check answers to calculations and determine, to three decimal places interpret and construct pie charts and line graphs and use these

- in the context of a problem, an appropriate degree of accuracy multiply simple pairs of proper fractions, writing the answer in its
- simplest form [for example $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
- divide proper fractions by whole numbers [for example,
- 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 involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison

- measurements of length, mass and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation
- interpret and construct pie charts and line graphs and use these

to solve problems

· calculate and interpret the mean as an average

KEY Number Sense Additive Reasoning Multiplicative Reasoning Geometric Reasoning

Sequence 14

- 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
- 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
- recognise that shapes with the same areas can have different perimeters and vice versa

- calculate the area of parallelograms and triangles
- recognise when it is possible to use the formulae for area and volume of shapes
- 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 km³¹
- use simple formulae
- · express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables
- solve problems involving similar shapes where the scale factor is known or can be found