Year 6 Yearly Overview

Number – number and place value

Statutory requirements

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.

Small Steps: Place Value

- Recap: numbers to 10,000
- Recap: numbers to 1,000,000
- Numbers to 10 million
- Compare numbers
- Order numbers
- Round numbers
- Negative numbers.

Ready-to-progress criteria

- **6NPV–1** Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).
- **6NPV–2** Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.
- **6NPV–3** Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.

Number – addition, subtraction, multiplication and division

Statutory requirements

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
- 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 addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Small Steps

- Add whole numbers with more than one digit.
- Subtract whole numbers with more than one digit.
- Use inverse operations.
- Multiply3 digits by 2 digits and 4 digits by 2 digits.
- Divide 4 digits by 1 digit.
- Divide with remainders.
- Division using factors.
- Factors of numbers.
- Common factors.
- Prime numbers and prime factors.
- Square and cubed numbers.
- Order of operations.

- **6AS/MD–1** Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).
- **6AS/MD–2** Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.

Number – fractions (including decimals and percentages)

Statutory requirements

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 [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
- divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]
- 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

Statutory requirements

- 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.

Small steps: fractions

- Find common denominators
- Simplify fractions
- Compare and order fractions
- Change mixed numbers to improper fractions and vice versa
- Add and subtract fractions
- Multiply fractions
- Divide fractions by integers

- **6F–1** Recognise when fractions can be simplified, and use common factors to simplify fractions.
- **6F–2** Express fractions in a common denomination and use this to compare fractions that are similar in value.
- **6F–3** Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.

Number – fractions (including decimals and percentages)

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- 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 [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
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Statutory requirements

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- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Small Steps: Percentages	Small Steps: Decimals
• Fractions to percentages. • Equivalent FDP. • Percentage of an amount (1). • Percentage of an amount (2). • Percentages – missing values. • Percentage increase and decrease. • Order FDP.	• Three decimal places. • Multiply by 10, 100 and 1,000. • Divide by 10, 100 and 1,000. • Multiply decimals by integers. • Divide decimals by integers. • Division to solve problems. • Decimals as fractions. • Fractions to decimals (1). • Fractions to decimals (2).

- **6NPV–1** Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).

Ratio and proportion

Statutory requirements

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 [for example, of measures, and 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.

Algebra

Statutory requirements

Pupils should be taught to:

- 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.

Ratio

- Use ratio language.
- Ratio and fractions.
- Introducing the ratio symbol.
- Calculating ratio.
- Using scale factors.
- Calculating scale factors.
- Ratio and proportion problems.

Algebra

- Find a rule – one step.
- Find a rule – two step.
- Use an algebraic rule.
- Substitution.
- Formulae.
- Word problems.
- Solve simple one step equations.
- Solve two step equations.
- Find pairs of values.
- Enumerate possibilities.

- **6AS/MD–3** Solve problems involving ratio relationships.

- **6AS/MD–4** Solve problems with 2 unknowns.

Measurement

Statutory requirements

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 cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3].

Convert Units	Perimeter, Area and Volume
• Metric measures. • Convert metric measures. • Calculate with metric measures. • Miles and kilometres. • Imperial measures.	• Shapes – same area. • Area and perimeter. • Area of a triangle (1). • Area of a triangle (2). • Area of a triangle (3). • Area of a parallelogram. • Volume – counting cubes. • Volume of a cuboid.

- **6G–1** Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

- **6NPV–4** Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.

Geometry – properties of shapes

Statutory requirements

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.

Shape

- Measure with a protractor.
- Introduce angles.
- Calculate angles.
- Vertically opposite angles.
- Angles in a triangle.
- Angles in a triangle – special cases.
- Angles in a triangle – missing angles.
- Angles in special quadrilaterals.
- Angles in regular polygons.
- Draw shapes accurately.
- Nets of 3D shapes.

- **6G–1** Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

Geometry – position and direction

Statutory requirements

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.

Statistics

Statutory requirements

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.

Position and direction

- Coordinates in the first quadrant.
- Coordinates n four quadrants.
- Translations.
- Reflections.

Statistics

- Read and interpret line graphs.
- Draw line graphs.
- Use line graphs to solve problems.
- Circles.
- Read and interpret pie charts.
- Pie charts with percentages.
- Draw pie charts.
- The mean.

- **6NPV–4** Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.