Year 6 Mathematics Planning

Unit 1 **Number – Number and place value**
Number – Addition and subtraction
Geometry – Properties of shapes

National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Number and place value	**Week 1**	
• 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 • solve number and practical problems that involve all of the above	• Read and write numbers up to 10 000 000 and determine the value of each digit	1
	• Order and compare numbers up to 10 000 000 and determine the value of each digit	2
	• Round any whole number to a required degree of accuracy	3
	• Solve number problems and reason mathematically	4
Number – Addition and subtraction	**Week 2**	
• perform mental calculations, including with large numbers • 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, an appropriate degree of accuracy	• Add mentally, including with large numbers • Use estimation to check answers	1
	• Subtract mentally, including with large numbers • Use estimation to check answers	2
	• Add and subtract decimals mentally	3
	• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • Use estimation to check accuracy of answers	4
Geometry – Properties of shapes	**Week 3**	
• recognise, describe and build simple 3-D shapes, including making nets	• Recognise, describe and build simple 3-D shapes	1
	• Identify and build different nets for a cube	2
	• Construct nets for a cube and a cuboid	3
	• Construct nets for 3-D shapes with one or more triangular faces	4

Unit 2 **Number – Multiplication and division**
Number – Fractions
Geometry – Position and direction

National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Multiplication and division	**Week 1**	
• practise multiplication for larger numbers, using the formal written methods of short and long multiplication * • perform mental calculations, including with large numbers • solve problems involving addition, subtraction, multiplication and division • use estimation to check answers to calculations	• Multiply mentally, including with large numbers • Use the formal written method of short multiplication to calculate ThHTO × O • Estimate and check the answer to a calculation	1
	• Use the expanded written method to calculate TO × TO • Estimate and check the answer to a calculation	2
	• Use the formal written method of long multiplication to calculate TO × TO • Estimate and check the answer to a calculation	3
	• Solve problems involving addition, subtraction, multiplication and division	4
Number – Fractions	**Week 2**	
• 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	• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination	1
	• Compare and order fractions, including fractions greater than 1	2
	• Add fractions with different denominators and mixed numbers, using the concept of equivalent fractions	3
	• Subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	4
Geometry – Position and direction	**Week 3**	
• 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 coordinates to describe the positions of shapes in all four quadrants	1
	• Plot and label rectangles, squares, parallelograms and rhombuses in the four quadrants; use the properties of shapes to predict missing coordinates	2
	• Use coordinates to translate shapes into all four quadrants; use the properties of shapes to predict missing coordinates	3

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• Use coordinates to reflect shapes in the axes into all four quadrants; use the properties of shapes to predict missing coordinates	4

* Notes and guidance (non-statutory)

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Unit 3 **Number – Addition and subtraction**
Number – Decimals
Measurement (length)

National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Addition and subtraction	**Week 1**	
• practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction * • 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, an appropriate degree of accuracy	• Add whole numbers using the formal written method of columnar addition • Estimate and check the answer to a calculation	1
	• Subtract whole numbers using the formal written method columnar subtraction (decomposition) • Estimate and check the answer to a calculation	2
	• Add and subtract decimals using the formal written methods of columnar addition and subtraction (decomposition) • Estimate and check the answer to a calculation	3
	• Solve problems which require answers to be rounded to specified degrees of accuracy	4
Number – Decimals	**Week 2**	
• 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 • multiply decimals by whole numbers, starting with the simplest cases, such as 0·4 × 2 = 0·8, and in practical contexts, such as measures and money * • solve problems which require answers to be rounded to specified degrees of accuracy	• Identify the value of each digit in a number with three decimal places	1
	• Multiply and divide numbers by 10, 100 and 1000 where the answers up to three decimal places Mental Starter	2
	• Multiply decimals by whole numbers including in practical contexts	3
	• Solve problems which require answers to be rounded to specified degrees of accuracy	4
Measurement (length)	**Week 3**	
• 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 from a smaller unit of measure to a larger unit, and vice versa, using decimal notation up to three decimal places • convert between miles and kilometres	• Convert from smaller to larger standard units of length and vice versa; use decimal notation up to three decimal places	1
	• Calculate and convert between standard units of length to solve problems; use decimal notation up to three decimal places	2
	• Calculate and convert between standard units of length to solve problems; use decimal notation up to three decimal places	3
	• Convert between miles and kilometres making approximate conversions and connect conversion to a graphical representation	4

Unit 4 **Number – Multiplication and division**
Number – Fractions (including decimals and percentages)
Measurement (time)

National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Multiplication and division	**Week 1**	
• practise division for larger numbers, using the formal written method of short division * • divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate • perform mental calculations, including with large numbers • identify common factors, common multiples and prime numbers • solve problems involving addition, subtraction, multiplication and division • use estimation to check answers to calculations	• Identify common factors, common multiples and prime numbers • Perform mental calculations, including with large numbers	1
	• Use the formal written method of short division to calculate ThHTO ÷ O • Estimate and check the answer to a calculation	2
	• Use the most efficient method to calculate ThHTO ÷ TO • Use the formal written method of short division to calculate ThHTO ÷ TO where appropriate • Estimate and check the answer to a calculation	3
	• Solve problems involving addition, subtraction, multiplication and division • Estimate and check the answer to a calculation	4
Number – Fractions (including decimals and percentages)	**Week 2**	
• 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 • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison [NC Domain: Ratio and proportion]	• Associate a fraction with division and calculate decimal fraction equivalents	1
	• Associate a fraction with division and calculate decimal fraction equivalents	2
	• Recall and use equivalences between fractions, decimals and percentages	3
	• Solve problems involving the calculation of percentages and the use of percentages for comparison	4
Measurement (time)	**Week 3**	

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• use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa	• Convert from smaller to larger standard units of time and vice versa	1
	• Calculate and convert between standard units of time to solve problems	2
	• Calculate speed using compound units, for example, miles per hour	3
	• Apply the calculation of speed using compound units to subjects such as science	4

* Notes and guidance (non-statutory)

Unit 5 **Number – Addition, subtraction, multiplication and division, including Number and place value**
Algebra
Geometry – Properties of shapes

National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Addition, subtraction, multiplication and division, including Number and place value	**Week 1**	
• 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 • practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction * • 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 negative numbers and calculate intervals across zero	1
	• Use negative numbers in context, and solve multi-step problems	2
	• Calculate mentally, including with mixed operations and large numbers • Use knowledge of the order of operations to carry out calculations involving the four operations	3
	• Add and subtract mentally and using the formal written methods • Solve problems involving addition, subtraction, multiplication and division	4
Number – Number and place value		
• use negative numbers in context, and calculate intervals across zero		
Algebra	**Week 2**	
• 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	• Use simple formulae	1
	• Generate and describe linear number sequences • Use simple formulae	2
	• Express missing number problems algebraically • Use simple formulae	3
	• Find pairs of numbers that satisfy an equation with two unknowns • Enumerate possibilities of combinations of two variables • Use simple formulae	4
Geometry – Properties of shapes		
• draw 2-D shapes using given dimensions and angles • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	• Draw 2-D shapes using given dimensions and angles; use measuring tools and conventional markings and labels for lines and angles	1
	• Use properties and sizes to compare and classify geometric shapes; find unknown angles in triangles, quadrilaterals, and regular polygons expressing relationships algebraically, e.g. a = 180 – (b + c)	2
	• Identify and name angles where they are vertically opposite	3
	• Identify and name angles where they meet at a point, are on a straight line, or are vertically opposite; find missing angles expressing relationships algebraically, e.g. a = 180 – (b + c)	4

* Notes and guidance (non-statutory)

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Unit 6	**Number – Multiplication and division** **Number – Multiplication and division, including Decimals** **Measurement (mass)**	
National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Multiplication and division	**Week 1**	
• practise multiplication for larger numbers, 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 • perform mental calculations, including large numbers • use estimation to check answers to calculations	• Multiply mentally, including large numbers • Use partitioning to calculate HTO × TO • Estimate and check the answer to a calculation	1
	• Multiply mentally, including large numbers • Use partitioning and the grid method to calculate HTO × TO • Estimate and check the answer to a calculation	2
	• Multiply mentally, including large numbers • Use the expanded written method to calculate HTO × TO • Estimate and check the answer to a calculation	3
	• Multiply mentally, including large numbers • Use the formal written method of long multiplication to calculate HTO × TO • Estimate and check the answer to a calculation	4
Number – Multiplication and division	**Week 2**	
• multiply decimals by whole numbers, starting with the simplest cases, such as 0·4 × 2 = 0·8, and in practical contexts, such as measures and money * • perform mental calculations • use estimation to check answers to calculations	• Use mental methods to multiply decimals to tenths or to hundredths by whole numbers, e.g. 0·4 × 2 = 0·8, 0·06 × 6 = 3·6 • Use mental methods to multiply one-digit numbers with one decimal place by whole numbers, e.g. 3·4 × 2	1
	• Multiply one- or two-digit numbers with up to two decimal places by one digit whole numbers using the grid method, e.g. 7·56 × 3, 35·4 × 5 • Estimate and check the answer to a calculation	2
Number – Decimals • multiply one-digit numbers with up to two decimal places by whole numbers • multiply numbers with up to two decimal places by one-digit whole numbers *	• Multiply one- or two-digit numbers with up to two decimal places by one digit whole numbers, e.g. 7·56 × 3, 35·4 × 5, using the expanded written method of short multiplication by converting decimals to whole numbers before calculating, then converting the answer back to decimals • Estimate and check the answer to a calculation	3
	• Multiply one- or two-digit numbers with up to two decimal places by one-digit whole numbers, e.g. 7·56 × 3, 35·4 × 5, using the formal written method of short multiplication by converting decimals to whole numbers before calculating, then converting the answer back to decimals • Estimate and check the answer to a calculation	4
Measurement (mass)	**Week 3**	
• 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 mass from a smaller unit of measure to a larger unit, and vice versa, using decimal notation up to three decimal places	• Convert from smaller to larger standard units of mass and vice versa; use decimal notation up to three decimal places	1
	• Convert from smaller to larger standard units of mass and vice versa; use decimal notation up to three decimal places	2
	• Calculate and convert between standard units of mass to solve problems; use decimal notation up to three decimal places	3
	• Calculate and convert between standard units of mass to solve problems; use decimal notation up to three decimal places	4

* Notes and guidance (non-statutory)

Year 6 Medium-Term Plans

Unit 7 **Number – Fractions**
Ratio and proportion
Statistics

National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Fractions	**Week 1**	
• use common factors to simplify fractions; use common multiples to express fractions in the same denomination • 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, $\frac{1}{3} \div 2 = \frac{1}{6}$]	• Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	1
	• Divide proper fractions by whole numbers	2
	• Multiply simple pairs of proper fractions, writing the answer in its simplest form	3
	• Solve problems that involve adding, subtracting, multiplying and dividing fractions • Use common factors to simplify fractions; use common multiples to express fractions in the same denomination	4
Ratio and proportion	**Week 2**	
• recognise proportionality in contexts when the relations between quantities are in the same ratio [for example, similar shapes and recipes] * • solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • consolidate understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems * • 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	• Recognise and solve proportion problems	1
	• Understand and use ratio to solve problems involving numbers, shapes and scale drawings • Solve problems involving similar shapes where the scale factor is known or can be found	2
	• Solve missing value ratio problems using multiplication and division	3
	• Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	4
Statistics	**Week 3**	
• interpret and construct pie charts and line graphs and use these to solve problems • draw graphs relating two variables * • calculate and interpret the mean as an average	• Interpret and construct pie charts and use them to solve problems	1
	• Interpret and construct line graphs relating two variables and use them to solve problems	2
	• Solve problems by collecting and organising data from an enquiry	3
	• Calculate and interpret the mean as an average	4

* Notes and guidance (non-statutory)

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Unit 8	Number – Multiplication and division Number – Multiplication and division, including Decimals Measurement (perimeter and area)	
National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Multiplication and division	**Week 1**	
• practise division for larger numbers, using the formal written method of long division * • 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 or fractions • perform mental calculations, including with large numbers • use estimation to check answers to calculations	• Divide mentally, including large numbers • Use the expanded written method of long division to calculate HTO ÷ TO and interpret any remainder as a whole number remainder or as a fraction • Estimate and check the answer to a calculation	1
	• Divide mentally, including large numbers • Use the expanded written method of long division to calculate ThHTO ÷ TO and interpret any remainder as a whole number remainder or as a fraction • Estimate and check the answer to a calculation	2
	• Divide mentally, including large numbers • Use the formal written method of long division to calculate HTO ÷ TO and interpret any remainder as a whole number remainder or as a fraction • Estimate and check the answer to a calculation	3
	• Divide mentally, including large numbers • Use the formal written method of long division to calculate ThHTO ÷ TO and interpret remainders as whole number remainders or as fractions Estimate and check the answer to a calculation	4
Number – Multiplication and division	**Week 2**	
• perform mental calculations • solve problems involving addition, subtraction, multiplication and division • solve problems which require answers to be rounded to specified degrees of accuracy • use estimation to check answers to calculations • perform mental calculations • use estimation to check answers to calculations	• Use mental methods to divide numbers with up to two decimal places by one-digit whole numbers, e.g. 6·4 ÷ 8, 32·4 ÷ 4, 6·39 ÷ 3 • Divide numbers with up to two decimal places by one-digit whole numbers using the formal written method of short division • Divide numbers with up to two decimal places by one-digit whole numbers using the formal written method for short division by converting decimals to whole numbers before calculating and then converting the answer back to decimals • Estimate and check the answer to a calculation	1
Number – including Decimals		
• use written division methods in cases where the answer has up to two decimal places • divide numbers with up to two decimal places by one-digit and two-digit whole numbers *	• Divide decimal numbers with up to two decimal places by two-digit whole numbers, e.g. 58·32 ÷ 18, using the expanded written method of long division • Divide decimal numbers with up to two decimal places by two-digit whole numbers, e.g. 58·32 ÷ 18, using the expanded written method of long division by converting decimals to whole numbers before calculating and then converting the answer back to decimals • Estimate and check the answer to a calculation	2
	• Divide decimal numbers with up to two decimal places by two-digit whole numbers, e.g. 58·32 ÷ 18, using the formal written method of long division • Divide decimal numbers with up to two decimal places by two-digit whole numbers, e.g. 58·32 ÷ 18, using the formal written method of long division by converting decimals to whole numbers before calculating and then converting the answer back to decimals • Solve problems which require answers to be rounded to specified degrees of accuracy • Estimate and check the answer to a calculation	3
	• Solve problems involving addition, subtraction, multiplication and division • Solve problems which require answers to be rounded to specified degrees of accuracy • Use estimation to check answers to calculations	4
Measurement (perimeter and area)	**Week 3**	
• recognise that shapes with the same areas can have different perimeters and vice versa	• Know that shapes with the same areas can have different perimeters and vice versa	1
	• Know when it is possible to use formulae for area of shapes	2

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• recognise when it is possible to use formulae for area of shapes • calculate the area of parallelograms and triangles	• Use the formula for the area of a rectangle to calculate the area of a triangle; relate the dissection of a rectangle to the area of a triangle	3
	• Use the formula for the area of a rectangle to calculate the area of a parallelogram; relate the dissection of a rectangle to the area of a parallelogram	4

* Notes and guidance (non-statutory)

Unit 9 **Number – Addition, subtraction, multiplication and division**
Algebra
Geometry – Properties of shapes

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National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Addition, subtraction, multiplication and division	**Week 1**	
• perform mental calculations, including large numbers • practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction * • use 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	• Perform mental calculations, including large numbers	1
	• Add and subtract whole numbers using the formal written methods of columnar addition and subtraction • Estimate and check the answer to a calculation	2
	• Use knowledge of the order of operations to carry out calculations involving the four operations	3
	• Solve problems involving addition, subtraction, multiplication and division	4
Algebra	**Week 2**	
• 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	• Use simple formulae • Generate and describe linear number sequences	1
	• Express missing number problems algebraically • Use simple formulae	2
	• Find pairs of numbers that satisfy an equation with two unknowns • Represent simple equations as a line graph	3
	• Enumerate possibilities of combinations of two variables • Use simple formulae	4
Geometry – Properties of shapes	**Week 3**	
• draw shapes accurately, using measuring tools and conventional markings and labels for lines and angles * • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius	• Draw and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius expressing the relationship algebraically, e.g. d = 2r	1
	• Use measuring tools and compasses to construct a regular hexagon; investigate patterns that are based on the hexagon within the circle	2
	• Use measuring tools and compasses to construct patterns that are based on the radius of the circle	3
	• Use measuring tools to construct 2-D shapes using given dimensions and angles; use conventional markings and labels for lines and angles	4

* Notes and guidance (non-statutory)

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Unit 10 **Number – Multiplication and division, including Decimals**
Number – Fractions
Measurement (volume and capacity)

National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Multiplication and division	**Week 1**	
• multiply multi-digit numbers up to 4 digits by a two- digit whole number using the formal written method of long multiplication • 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	• Use mental methods to divide numbers with up to two decimal places by digit whole numbers, e.g. 6·4 ÷ 8, 32·4 ÷ 4, 6·39 ÷ 3 • Divide numbers with up to two decimal places by one-digit whole numbers using the formal written method of short division • Divide numbers with up to two decimal places by one-digit whole numbers using the formal written method for short division by converting decimals to whole numbers before calculating and then converting the answer back to decimals • Estimate and check the answer to a calculation	1 2
Number – Decimals		
• multiply one-digit numbers with up to two decimal places by whole numbers • multiply numbers with up to two decimal places by two-digit whole numbers *	• Multiply one-digit numbers with up to two decimal places by two-digit whole numbers, e.g. 7·56 × 34, using the formal written method by converting decimals to whole numbers before calculating, then convert the answer back to decimals • Estimate and check the answer to a calculation	3
	• 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	4
Number – Fractions	**Week 2**	
• use common factors to simplify fractions; use common multiples to express fractions in the same denomination • 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, $\frac{1}{3} \div 2 = \frac{1}{6}$]	• Use common factors to simplify fractions • Use common multiples to express fractions in the same denomination	1
	• Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	2
	• Multiply simple pairs of proper fractions, writing the answer in its simplest form	3
	• Divide proper fractions by whole numbers	4
Measurement (volume and capacity)	**Week 3**	
• 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 volume from a smaller unit of measure to a larger unit, and vice versa, using decimal notation up to three decimal places • recognise when it is possible to use formulae for volume of shapes • 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]	• Convert from smaller to larger standard units of capacity and vice versa; use decimal notation up to three decimal places	1
	• Calculate and convert between standard units of capacity to solve problems; use decimal notation up to three decimal places	2
	• Estimate, calculate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3) and the rule = *lbh*	3
	• Calculate and compare volume of cubes and cuboids using cubic centimetres (cm^3), cubic metres (m^3), cubic millimetres (mm^3) and the rule *V* = *lbh*, and find missing lengths	4

* Notes and guidance (non-statutory)

Year 6 Mathematics Planning

Unit 11 **Number – Addition, subtraction, multiplication and division**
Ratio and proportion
Geometry – Position and direction

National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Addition, subtraction, multiplication and division	**Week 1**	
• 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 problems involving addition, subtraction, multiplication and division	• Use knowledge of the order of operations to carry out calculations involving the four operations	1
	• Use knowledge of the order of operations to carry out calculations involving the four operations • Perform mental calculations, including with mixed operations and large numbers	2
	• Solve problems involving addition, subtraction, multiplication and division	3
	• Solve problems involving addition, subtraction, multiplication and division	4
Ratio and proportion	**Week 2**	
• recognise proportionality in contexts when the relations between quantities are in the same ratio [for example, similar shapes and recipes] * • solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • consolidate understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems * • 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	• Recognise and solve proportion problems	1
	• Understand and use ratio to solve problems • Solve problems involving scale factors	2
	• Solve missing value ratio problems using multiplication and division	3
	• Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	4
Geometry – Position and direction	**Week 3**	
• 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 • draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes *	• Use coordinates to describe the positions of shapes in all four quadrants	1
	• Plot and label rectangles, squares, parallelograms and rhombuses in the four quadrants; use the properties of shapes to predict missing coordinates	2
	• Use coordinates to translate shapes into all four quadrants; use the properties of shapes to predict missing coordinates	3
	• Use coordinates to reflect shapes in the axes into all four quadrants; use the properties of shapes to predict missing coordinates	4

* Notes and guidance (non-statutory)

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Unit 12 **Number – Multiplication and division, including Decimals**
Number – Fractions (including decimals and percentages)
Statistics

National Curriculum attainment targets Pupils should be taught to:	**Lesson objectives** Pupils will be taught to:	**Lesson**
Number – Multiplication and division	**Week 1**	
• 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 • divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate • perform mental calculations • identify common factors, common multiples • solve problems involving addition, subtraction, multiplication and division • solve problems which require answers to be rounded to specified degrees of accuracy • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	• Perform mental calculations • Identify common factors, common multiples	1
	• Use appropriate methods to multiply and divide whole numbers up to 4 digits by a one- or two-digit whole number using the formal written method • Estimate and check the answer to a calculation	2
	• Use appropriate methods to multiply or divide numbers with up to two decimal places by one-digit and two-digit whole numbers • Estimate and check the answer to a calculation	3
	• Solve problems involving addition, subtraction, multiplication and division • Solve problems which require answers to be rounded to specified degrees of accuracy • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	4
Number – Decimals		
• 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 • multiply numbers with up to two decimal places by two-digit whole numbers * • divide numbers with up to two decimal places by one-digit and two-digit whole numbers *		
Number – Fractions (including decimals and percentages)	**Week 2**	
• associate a fraction with division and calculate decimal fraction equivalents [for example, 0·375] for a simple fraction [for example, $\frac{3}{8}$] • 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 • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison [NC Domain: Ratio and proportion]	• Solve problems involving the calculation of percentages and the use of percentages for comparison	1
	• Recall and use equivalences between fractions, decimals and percentages, including in different contexts	2
	• Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction • Solve problems which require answers to be rounded to specified degrees of accuracy	3
	• Find fraction equivalents for decimal fractions and check with division	4
Statistics	**Week 3**	
• interpret and construct pie charts and line graphs and use these to solve problems • draw graphs relating two variables * • calculate and interpret the mean as an average	• Interpret and construct pie charts and use them to solve problems	1
	• Interpret and construct line graphs relating two variables and use them to solve problems	2
	• Solve problems by collecting and organising data from an enquiry and by drawing graphs relating two variables	3
	• Calculate and interpret the mean as an average	4

* Notes and guidance (non-statutory)