

Boston Pioneers- Year 1 Maths Overview

Number			
<p><u>Number and Place Value</u> Pupils should be taught to:</p> <ul style="list-style-type: none"> ♣ count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number ♣ count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens ♣ given a number, identify one more and one less ♣ identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least ♣ read and write numbers from 1 to 20 in numerals and words. 	<p><u>Addition and Subtraction</u> Pupils should be taught to:</p> <ul style="list-style-type: none"> ♣ read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs ♣ represent and use number bonds and related subtraction facts within 20 ♣ add and subtract one-digit and two-digit numbers to 20, including zero ♣ solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$ 	<p><u>Multiplication and Division</u> Pupils should be taught to:</p> <ul style="list-style-type: none"> ♣ solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. 	<p><u>Fractions</u> Pupils should be taught to:</p> <ul style="list-style-type: none"> ♣ recognise, find and name a half as one of two equal parts of an object, shape or quantity ♣ recognise, find and name a quarter as one of four equal parts of an object, shape or quantity
<p><u>Guidance</u> Pupils practise counting (1, 2, 3...), ordering (for example, first, second, third...), and to indicate a quantity (for example, 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent. Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations. They</p>	<p><u>Guidance</u> Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$). They should realise the effect of adding or subtracting zero. This</p>	<p><u>Guidance</u> Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and</p>	<p><u>Guidance</u> Pupils are taught half and quarter as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. For example, they could recognise and find half a length, quantity, set of objects or shape. Pupils connect halves and quarters to the equal sharing and grouping</p>

<p>practise counting as reciting numbers and counting as enumerating objects, and counting in twos, fives and tens from different multiples to develop their recognition of patterns in the number system (for example, odd and even numbers), including varied and frequent practice through increasingly complex questions. They recognise and create repeating patterns with objects and with shapes</p>	<p>establishes addition and subtraction as related operations. Pupils combine and increase numbers, counting forwards and backwards. They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly</p>	<p>quantities. They make connections between arrays, number patterns, and counting in twos, fives and tens</p>	<p>of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.</p>
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Measures and Geometry

<p><u>Measurement</u> Pupils should be taught to:</p> <ul style="list-style-type: none"> ♣ compare, describe and solve practical problems for: ♣ lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] ♣ mass/weight [for example, heavy/light, heavier than, lighter than] ♣ capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] 	<p><u>Properties of Shape</u> Pupils should be taught to:</p> <ul style="list-style-type: none"> ♣ recognise and name common 2-D and 3-D shapes, including: ♣ 2-D shapes [for example, rectangles (including squares), circles and triangles] 	<p><u>Geometry- Position and Direction</u> Pupils should be taught to:</p> <ul style="list-style-type: none"> ♣ describe position, direction and movement, including whole, half, quarter and three quarter turns. 	<p><u>NON-STATUTORY: Statistics</u> Pupils should be taught to:</p> <ul style="list-style-type: none"> • interpret simple pictograms and simple tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
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<ul style="list-style-type: none"> ♣ time [for example, quicker, slower, earlier, later] ♣ measure and begin to record the following: ♣ lengths and heights ♣ mass/weight ♣ capacity and volume ♣ time (hours, minutes, seconds) ♣ recognise and know the value of different denominations of coins and notes ♣ sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] ♣ recognise and use language relating to dates, including days of the week, weeks, months and years ♣ tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. 	<ul style="list-style-type: none"> ♣ 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]. 		
<p><u>Guidance</u> The pairs of terms: mass and weight, volume and capacity, are used interchangeably at this stage. Pupils move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units. In order to become familiar with standard measures, pupils begin to use measuring tools such as a ruler, weighing scales and containers. Pupils use the language of time, including telling the time throughout the day, first using o'clock and then half past.</p>	<p><u>Guidance</u> Pupils handle common 2-D and 3-D shapes, naming these and related everyday objects fluently. They recognise these shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other.</p>	<p><u>Guidance</u> Pupils use the language of position, direction and motion, including: left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside. Pupils make whole, half, quarter and three-quarter turns in both directions and connect turning clockwise with movement on a clock face.</p>	<p><u>Guidance</u> NON-STATUTORY: Algebra Pupils should be taught to:</p> <ul style="list-style-type: none"> • investigate using Cuisenaire rods to represent the different colours that make a whole e.g. 1 yellow = 2 red and 1 white (1y = 2r and 1w) etc

Boston Pioneers- Year 2 Maths Overview

Number

Number and Place Value

Pupils should be taught to:

- count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- recognise the place value of each digit in a two-digit number (tens, ones)
- identify, represent and estimate numbers using different representations, including the number line
- compare and order numbers from 0 up to 100; use and = signs
- read and write numbers to at least 100 in numerals and in words
- use place value and number facts to solve problems.

Addition and Subtraction

Pupils should be taught to:

- solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- solve problems with addition and subtraction applying their increasing knowledge of mental and written methods
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit

Multiplication and

Division

Pupils should be taught to:

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- solve problems involving multiplication and division, using materials, arrays,

Fractions

Pupils should be taught to:

- recognise, find, name and write fractions, one third, one quarter, two quarters and three quarters of a length, shape, set of objects or quantity
- write simple fractions for example, one half of 6 = 3 and recognise the eq

	<p>numbers; adding three one digit numbers</p> <ul style="list-style-type: none"> • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. 	<p>repeated addition, mental methods, and multiplication and division facts, including problems in contexts.</p>	
<p><u>Guidance</u> Number and Place Value</p> <ul style="list-style-type: none"> • Using materials and a range of representations, pupils practise counting, reading, writing and comparing numbers to at least 100 and solving a variety of related problems to develop fluency. They count in multiples of three to support their later understanding of a third. • As they become more confident with numbers up to 100, pupils are introduced to larger numbers to develop further their recognition of patterns within the number system and represent them in different ways, including spatial representations. • Pupils should partition numbers in different ways (for example, $23 = 20 + 3$ and $23 = 10 + 13$) to support subtraction. They become fluent and apply their knowledge of numbers to reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers. They begin to understand zero as a place holder. 	<p><u>Guidance</u> Addition and Subtraction</p> <ul style="list-style-type: none"> • Pupils extend their understanding of the language of addition and subtraction to include sum and difference. • Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to calculate $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$). This establishes commutativity and associativity of addition. • Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers 	<p><u>Guidance</u> Multiplication and Division</p> <ul style="list-style-type: none"> • Pupils use a variety of language to describe multiplication and division. • Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. • Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, $40 \div 2 = 20$, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, $4 \times 5 = 20$ and $20 \div 5 = 4$). 	<p><u>Guidance</u> Fractions</p> <ul style="list-style-type: none"> • Pupils use fractions as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. They connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes. They meet three-quarters as the first example of a non-unit fraction. • Pupils should count in fractions up to 10, starting from any number and using the half and two quarters equivalence on the number line (for example, 1 and a quarter, 1 and two quarters (or 1 and a half), 1 and three-quarters and 2. This reinforces the concept of fractions as numbers and that they can add up to more than one.

Measures, Geometry and Statistics

Measures

Pupils should be taught to:

- choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ($^{\circ}\text{C}$); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- compare and order lengths, mass, volume/capacity and record the results using $>$, $<$ and $=$
- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- find different combinations of coins that equal the same amounts of money

Properties of Shape

Pupils should be taught to:

- identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
- identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- identify 2-D shapes on the surface of 3-D shapes [for example, a

Position and Direction

Pupils should be taught to:

- order and arrange combinations of mathematical objects in patterns and sequences
- use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter,

Statistics

Pupils should be taught to:

- interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- ask and answer questions about totalling and comparing categorical data.

<ul style="list-style-type: none"> • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time • tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour and the number of hours in a day. 	<p>circle on a cylinder and a triangle on a pyramid]</p> <ul style="list-style-type: none"> • compare and sort common 2-D and 3-D shapes and everyday objects 	<p>half and three-quarter turns (clockwise and anti-clockwise)</p>	<p><u>GUIDANCE: Statistics</u></p> <ul style="list-style-type: none"> • Pupils record, interpret, collate, organise and compare information (for example, using many-to-one correspondence in pictograms with simple ratios 2, 5, 10)
<p><u>GUIDANCE:</u></p> <p><u>Measures</u></p> <ul style="list-style-type: none"> • Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system. They use the appropriate language and record using standard abbreviations. • Comparing measures includes simple multiples such as 'half as high'; 'twice as wide' • They become fluent in telling the time on analogue clocks and recording it • Pupils become fluent in counting and recognising coins. They read and say amounts of money confidently and use the symbols £ and p accurately, recording pounds and pence separately. 	<p><u>GUIDANCE:</u></p> <p><u>Properties of Shape</u></p> <ul style="list-style-type: none"> • Pupils handle and name a wide variety of common 2-D and 3-D shapes including: quadrilaterals and polygons, and cuboids, prisms and cones, and identify the properties of each shape (for example, number of sides, number of faces). Pupils identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces. • Pupils read and write 	<p><u>GUIDANCE:</u></p> <p><u>Position and Direction</u></p> <ul style="list-style-type: none"> • Pupils should work with patterns of shapes, including those in different orientations • Pupils use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (for example, pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles). 	<p><u>NON-STATUTORY:</u></p> <p><u>Algebra</u> Pupils should be taught to:</p> <ul style="list-style-type: none"> • explore basic missing number statements for addition and subtraction e.g. $5 + ? = 9$ • understand that the = sign can be moved in a calculation e.g. $3 + 4 = 7$, $7 = 3 + 4$ extend this to $3 + 1 = 2 + ?$

	<p>names for shapes that are appropriate for their word reading and spelling.</p> <ul style="list-style-type: none">• Pupils draw lines and shapes using a straight edge.		
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Boston Pioneers- Year 3 Maths Overview

Number

Number and Place Value

Pupils should be taught to:

- count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
- recognise the place value of each digit in a three-digit number (hundreds, tens, ones)
- compare and order numbers up to 1000
- identify, represent and estimate numbers using different representations
- read and write numbers up to 1000 in numerals and in words
- solve number problems and practical problems involving these ideas.

Addition and Subtraction

Pupils should be taught to:

- add and subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Multiplication and Division

Pupils should be taught to:

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and

Fractions

Pupils should be taught to:

- count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10
- recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
- recognise and show, using diagrams, equivalent fractions with small denominators
- add and subtract fractions with the same denominator within one whole [for example, five sevenths add one seventh = six sevenths]
- compare and order unit fractions, and fractions with the same denominators
- solve problems that involve all of the above.

		correspondence problems in which n objects are connected to m objects.	
<p><u>GUIDANCE</u> <u>Number and Place Value</u></p> <ul style="list-style-type: none"> • Pupils now use multiples of 2, 3, 4, 5, 8, 10, 50 and 100. • They use larger numbers to at least 1000, applying partitioning related to place value using varied and increasingly complex problems, building on work in year 2 (for example, $146 = 100 + 40$ and 6, $146 = 130 + 16$). • Using a variety of representations, including those related to measure, pupils continue to count in ones, tens and hundreds, so that they become fluent in the order and place value of numbers to 1000. 	<p><u>GUIDANCE:</u> <u>Addition and Subtraction</u></p> <ul style="list-style-type: none"> • Pupils practise solving varied addition and subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100. • Pupils use their understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to three digits to become fluent 	<p><u>GUIDANCE:</u> <u>Multiplication and Division</u></p> <ul style="list-style-type: none"> • Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables. • Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts (for example, using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts (for example, $30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$). • Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division. • Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?; 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children). 	<p><u>GUIDANCE:</u> <u>Fractions</u></p> <ul style="list-style-type: none"> • Pupils connect tenths to place value, decimal measures and to division by 10. • They begin to understand unit and non-unit fractions as numbers on the number line, and deduce relations between them, such as size and equivalence. They should go beyond the $[0, 1]$ interval, including relating this to measure. • Pupils understand the relation between unit fractions as operators (fractions of), and division by integers. • They continue to recognise fractions in the context of parts of a whole, numbers, measurements, a shape, and unit fractions as a division of a quantity. • Pupils practise adding and subtracting fractions with the same denominator through a variety of increasingly complex problems to improve fluency.

Measures, Geometry and Statistics

Measures

Pupils should be taught to:

- measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
- measure the perimeter of simple 2-D shapes
 - add and subtract amounts of money to give change, using both £ and p in practical contexts
- tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks
- estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight
 - know the number of seconds in a minute and the number of days in each month, year and leap year
- compare durations of events [for example to calculate the time taken by particular events or tasks].

Properties of Shape

Pupils should be taught to:

- draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
- recognise angles as a property of shape or a description of a turn
 - identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle
 - identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

Statistics

Pupils should be taught to:

- interpret and present data using bar charts, pictograms and tables
- solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.

Guidance Statistics

- Pupils understand and use simple scales (for example, 2, 5, 10 units per cm) in pictograms and bar charts with increasing accuracy
- They continue to interpret data presented in many contexts

Ratio and Proportion

Pupils should be taught to:

- begin to understand the difference between ratio and proportion
- use simple proportions expressed as 'one in every.....'
- use simple ratios expressed as, for example, 'for every one white you have two blues.'
- use practical equipment to demonstrate understanding of ratio and proportion

<p><u>GUIDANCE:</u> <u>Measures</u></p> <ul style="list-style-type: none"> • Pupils continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed units (for example, 1 kg and 200g) and simple equivalents of mixed units (for example, 5m = 500cm). • The comparison of measures includes simple scaling by integers (for example, a given quantity or measure is twice as long or five times as high) and this connects to multiplication. • Pupils continue to become fluent in recognising the value of coins, by adding and subtracting amounts, including mixed units, and giving change using manageable amounts. They record £ and p separately. The decimal recording of money is introduced formally in year 4. • Pupils use both analogue and digital 12-hour clocks and record their times. In this way they become fluent in and prepared 	<p><u>GUIDANCE:</u> <u>Properties of Shape</u></p> <ul style="list-style-type: none"> • Pupils' knowledge of the properties of shapes is extended at this stage to symmetrical and non-symmetrical polygons and polyhedra. Pupils extend their use of the properties of shapes. They should be able to describe the properties of 2-D and 3-D shapes using accurate language, including lengths of lines and acute and obtuse for angles greater or lesser than a right angle. • Pupils connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts. 		<p><u>NON-STATUTORY:</u> <u>Position and Direction</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • revision of Y2 - use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise). Describe positions on a 2-D grid as coordinates in the first quadrant <p><u>NON-STATUTORY:</u> <u>Algebra</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • understand that symbols can represent variables and unknowns in mathematical situations that they already understand (addition, subtraction) e.g. missing numbers in sentences ($\Delta + 4 = 10$)
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Boston Pioneers- Year 4 Maths Overview

Number

Number and Place Value

Pupils should be taught to:

- count in multiples of 6, 7, 9, 25 and 1000
- find 1000 more or less than a given number
- count backwards through zero to include negative numbers
 - recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)
- order and compare numbers beyond 1000
 - identify, represent and estimate numbers using different representations
 - round any number to the nearest 10, 100 or 1000
 - solve number and practical problems that involve all of the above and with increasingly large positive numbers
- read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.

Addition and Subtraction

Pupils should be taught to:

- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Multiplication and Division

Pupils should be taught to:

- recall multiplication and division facts for multiplication tables up to 12×12
 - use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
- recognise and use factor pairs and commutativity in mental calculations
 - multiply two-digit and three-digit numbers by a one-digit number using formal written layout
 - solve problems involving multiplying and adding, including using the distributive law to

Fractions

Pupils should be taught to:

- recognise and show, using diagrams, families of common equivalent fractions
 - count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
- solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number
 - add and subtract fractions with the same denominator
 - recognise and write decimal equivalents of any number of tenths or hundredths
 - recognise and write decimal equivalents to one quarter, one half and three quarters.
 - find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths

		<p>multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.</p>	<ul style="list-style-type: none"> • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure and money problems involving fractions and decimals to two decimal places.
<p><u>GUIDANCE:</u> <u>Number and Place Value</u></p> <ul style="list-style-type: none"> • Using a variety of representations, including measures, pupils become fluent in the order and place value of numbers beyond 1000, including counting in tens and hundreds, and maintaining fluency in other multiples through varied and frequent practice. • They begin to extend their knowledge of the number system to include the decimal numbers and fractions that they have met so far. • They connect estimation and rounding numbers to the use of measuring instruments. • Roman numerals should be put in their historical context so pupils understand that there have been different ways to write whole numbers and that the important concepts of zero and place value were introduced over a period of time 	<p><u>GUIDANCE:</u> <u>Addition and Subtraction</u></p> <ul style="list-style-type: none"> • Pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency 	<p><u>GUIDANCE:</u> <u>Multiplication and Division</u></p> <ul style="list-style-type: none"> • Pupils continue to practise recalling and using multiplication tables and related division facts to aid fluency. • Pupils practise mental methods and extend this to three-digit numbers to derive facts, (for example $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$) • Pupils practise to become fluent in the formal written method of short multiplication and short division with exact answers. • Pupils write statements about the equality of expressions (for example, use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, $2 \times 6 \times 5 = 10$ 	<p><u>GUIDANCE:</u> <u>Fractions</u></p> <ul style="list-style-type: none"> • Pupils should connect hundredths to tenths and place value and decimal measure. • They extend the use of the number line to connect fractions, numbers and measures • Pupils understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths. • Pupils make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities. Pupils use factors and multiples to recognise equivalent fractions and simplify where appropriate (for example, $6/9 = 2/3$ or $1/4 = 2/8$). • Pupils continue to practise adding and subtracting fractions with the same denominator, to become fluent through a variety of increasingly complex problems beyond one whole • Pupils are taught throughout that decimals and fractions are different ways of expressing numbers and proportions. • Pupils' understanding of the number system and decimal

		<p>$\times 6 = 60$.</p> <ul style="list-style-type: none"> • Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children. 	<p>place value is extended at this stage to tenths and then hundredths. This includes relating the decimal notation to division of whole number by 10 and later 100</p> <ul style="list-style-type: none"> • They practise counting using simple fractions and decimals, both forwards and backwards. • Pupils learn decimal notation and the language associated with it, including in the context of measurements. They make comparisons and order decimal amounts and quantities that are expressed to the same number of decimal places. They should be able to represent numbers with one or two decimal places in several ways, such as on number lines
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Measures, Geometry and Statistics

<p><u>Measures</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Convert between different units of measure [for example, kilometre to metre; hour to minute] • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares 	<p><u>Properties of Shape</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify acute and 	<p><u>Position and Direction</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and 	<p><u>Statistics</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.
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<ul style="list-style-type: none"> estimate, compare and calculate different measures, including money in pounds and pence read, write and convert time between analogue and digital 12- and 24-hour clocks solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. 	<p>obtuse angles and compare and order angles up to two right angles by size</p> <ul style="list-style-type: none"> identify lines of symmetry in 2-D shapes presented in different orientations complete a simple symmetric figure with respect to a specific line of symmetry 	<p>up/down</p> <ul style="list-style-type: none"> plot specified points and draw sides to complete a given polygon. 	<p><u>GUIDANCE: Statistics</u></p> <ul style="list-style-type: none"> Pupils understand and use a greater range of scales in their representations. Pupils begin to relate the graphical representation of data to recording change over time
<p><u>GUIDANCE:</u> <u>Statistics</u></p> <ul style="list-style-type: none"> Pupils understand and use a greater range of scales in their representations. Pupils begin to relate the graphical representation of data to recording change over time 	<p><u>GUIDANCE:</u> <u>Properties of Shape</u></p> <ul style="list-style-type: none"> Pupils continue to classify shapes using geometrical properties, extending to classifying different triangles (e.g. isosceles, equilateral, scalene) and quadrilaterals (for example, parallelogram, rhombus, trapezium). Pupils compare and order angles in preparation for using a protractor and compare lengths and angles to decide if a polygon is regular or irregular. Pupils draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry; and recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape. 	<p><u>GUIDANCE:</u> <u>Position and Direction</u></p> <ul style="list-style-type: none"> Pupils draw a pair of axes in one quadrant, with equal scales and integer labels. They read, write and use pairs of coordinates, for example (2, 5), including using coordinate-plotting ICT tools. 	<p><u>NON-STATUTORY:</u> <u>Algebra</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> understand that symbols can represent variables and unknowns in mathematical situations that they already understand (addition, subtraction, multiplication and division) e.g. missing numbers in sentences ($\Delta \times 5 = 20$ or $32 \div \Delta = 4$) carry out simple number puzzles using symbols (see attached sheet) <p><u>NON-STATUTORY:</u> <u>Ratio and Proportion</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> know the difference between ratio and proportion use and identify simple proportions e.g. two in every five counters are blue, colour 4 out of every 5 square in green; use symbols and other practical objects to demonstrate this investigate simple ratio and proportion problems e.g. recipes, mixing drinks etc.

