MATHS CURRICULUM COVERAGE

Level Expected at the End of EYFS	
Number • Have a deep understanding of number to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5. • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.	**Numerical Patterns** • Verbally count beyond 20, recognising the pattern of the counting system. • Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Aims of the national curriculum

Aims The national curriculum for mathematics aims to ensure that all pupils:

Become ***fluent i***n the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

Can solve problems by ***applying*** their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

As trust, we have taken on board the findings of the recent Ofsted research review into mathematics to break down curriculum components into declarative, procedural and conditional knowledge.

Declarative knowledge is static in nature and consists of facts, formulae, concepts, principles and rules. All content in this category can be prefaced with the sentence stem ***'I know that'***.

Procedural knowledge is recalled as a sequence of steps. The category includes methods, algorithms and procedures: everything from long division, ways of setting out calculations in workbooks to the familiar step-by-step approaches to solving quadratic equations. All content in this category can be prefaced by the sentence stem ***'I know how'.***

Conditional knowledge gives pupils the ability to reason and solve problems. Useful combinations of declarative and procedural knowledge are transformed into strategies when pupils learn to match the problem types that they can be used for.

All content in this category can be prefaced by the sentence stem *'I* ***know when'.***

Skills Progression

Number

- Declarative- knowing what
- Procedural- knowing how

Conditional- knowing when and why

Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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Declarative • Say number words in sequence • Subitise (recognise quantities without counting) up to • Match numeral to quantity Link the number symbol (numeral) with its cardinal number value. **Procedural** • Count objects from a larger group. • Count objects in irregular arrangements **Conditional** • Recognise amounts that amounts that have been rearranged remain the same, if nothing has been added or taken away (conservation).	**Declarative** • Read and write numbers to at least 100 in numerals. • Read and write numbers from 1 to 20 in numerals and words. • Count to and across 100 forwards and backwards • Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers. • Recognise odd and even numbers. • Identify one more or less than a given number. **Procedural** • Identify and represent numbers using objects and pictorial representations including the number line. • Use the language of: equal to, more than, less than, most, least **Conditional** • Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =.	**Declarative** • Read and write numbers to at least 100 in numerals and in words. • Identify numbers using different representations, including the number line. • Recognise the place value of each digit in a two-digit number • Count in steps of 10 from any number, forward and backward **Procedural** • Order and compare numbers from 0 up to 100; use < > and = signs. • Represent and estimate numbers using different representations, including the number line. • Compose and decompose 2-digit numbers using standard and non-standard partitioning. **Conditional** • Reason about the location of any 2-digit number in the linear number system, including identifying the previous and next multiple of 10. • Use place value and number facts to solve problems.	**Declarative** • Read and write numbers up to 1000 in numerals and in words • Recognise the place value of each digit in a three-digit number. • Identify numbers using different representations. • Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number. • Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of10; apply this to work out how many 10s there are in other 3-digit multiples of 10. **Procedural** • Order and compare numbers up to 1000. • Represent and estimate numbers using different representations. • Compose and decompose 3-digit numbers using standard and non-standard partitioning. **Conditional** • Reason about the location of any 3-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10. • Solve number problems and practical problems involving the decorative and procedural knowledge above.	**Declarative** • Identify and represent numbers using different representations. • Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones). • Count in multiples of 6, 7, 9, 25 and 1000. • Count backwards through zero to include negative numbers • Find 1000 more or less than a given number. • Know that 10 hundreds are equivalent to 1 thousand, and that 1000 is 10 times the size of 100; apply this identify and work out how many hundreds there are in other 4-digit multiples of 100. • 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. **Procedural** • Order and compare numbers beyond 1000. • Estimate numbers using different representations. • Compose and decompose 4-digit numbers using standard and non-standard partitioning. • Round any number to the nearest 10, 100 or 1000 **Conditional;** • Reason about the location of any 4-digit number in the linear number system, including identifying the previous and next multiple of 1000 and 100 and rounding to the nearest of each. • Solve number and practical problems that involve all of the above and with increasingly large positive numbers.	**Declarative** • Read and write numbers to at least 1 000 000 and determine the value of each digit • Recognise the place value of each digit in numbers with up to 2 decimal places. • Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000. • Count forwards and backwards with positive and negative whole numbers, including through zero. • Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1; • Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01; • Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01; • Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. **Procedural** • Order and compare numbers to at least 1 000 000. • Compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning. • Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000. **Conditional** • Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each. • Solve number problems and practical problems that involve all Year 5 Declarative and Procedural knowledge. • Interpret negative numbers in context.	**Declarative** • Read and write numbers up to 10 000 000 and determine the value of each digit. • Recognise the place value of each digit in numbers with up to 10 million, including decimal fractions. • Understand the relationship between the powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply by 10, 100 and 1000). • Round any whole number to a required degree of accuracy. **Procedural** • Order and compare numbers up to 10 000 000. • Compose and decompose numbers with up to 10 million using standard and non-standard partitioning. • Use negative numbers in context, and calculate intervals across zero. **Conditional** • Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each. • Solve number problems and practical problems that involve all Year 6 Declarative and Procedural knowledge. •

Calculation

- Declarative- knowing what
- Procedural- knowing how
- Conditional- knowing when and why

Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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Declarative • Identify smaller numbers within a number (conceptual subitising) • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. • Say when a number does not match a quantity. **Procedural** • Compare collections and talk about which group has more or less things. • Partition a number in a range of ways and identify that the pairs of numbers make the same total. • Check that groups are equal by matching on a one-to-one basis. • Say which number is larger by counting or matching one-to-one. • Compare numbers that are far apart, near to and next to each other. • Understand that a number can be partitioned into more than two groups. **Conditional** • Understand how many things are hidden from a known quantity.	**Declarative** • Represent and use number bonds and related subtraction facts within 20. • Develop fluency in addition and subtraction facts within 10. **Procedural** • Add and subtract one-digit and two-digit numbers to 20, including zero. • Read, write and interpret mathematical statements involving addition, subtraction and equals signs. • Compose numbers to 10 from 2-parts, and partition numbers to 10 into parts. • Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables. **Conditional** • Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations. • Solve missing number problems such as 7 = * - 9 • Solve one-step problems involving multiplication and division, using concrete objects, pictorial representations and arrays with support. • Relate additive expressions and equations to real-life contexts.	**Declarative** • Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • Secure fluency in addition and subtraction facts within 10. • Secure fluency in addition and subtraction facts that bridge 10, through continued practice. • Recall (to 10) and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. **Procedural** • 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 numbers; adding three one-digit numbers. • Add and subtract across 10. • Add and subtract within 100 by applying related 1-digit facts. • Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?" • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs **Conditional** • Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures. • Apply their increasing knowledge of mental and written methods • Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot	**Declarative** • Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number • Calculate complements to 100. • Understand and use the commutative property of addition, and understand the related property for subtraction. • Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts. **Procedural** • 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. • 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. **Conditional** • Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. • Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. • Apply place-value knowledge to known additive and multiplicative number facts (scaling by 10). • Apply known multiplication and division facts to solve contextual problems with	**Declarative** • Recall multiplication and division facts for multiplication tables up to 12 × 12, and recognise products in multiplication tables as multiples of the corresponding number. • Recognise factor pairs. • Divide 1000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1000 with 2, 4, 5 and 10 equal parts. • Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. **Procedural** • Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. • Use factor pairs and commutativity in mental calculations. • 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 • Solve division problems, with 2-digit dividends and 1-digit divisors that involve remainders. **Conditional** • Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. • Interpret remainders appropriately according to the context. • Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to objects.	**Declarative** • Secure fluency in multiplication table facts, and corresponding division facts, through continued practice. • Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3). • Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. • Recall prime numbers up to 19. • Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts. • Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size. **Procedural** • Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). • Add and subtract numbers mentally with increasingly large numbers. • Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers. • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. • Multiply and divide numbers mentally drawing upon known facts. • Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. • Find factors and multiples of positive whole numbers, including common factors and common multiples, finding all factor pairs of a number, and expressa given number as a product of 2 or 3 factors.	**Declarative** • Sustain fluency in multiplication table facts, and corresponding division facts, through continued practice. • Identify common factors, common multiples and prime numbers. **Procedural** • 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. • Use their knowledge of the order of operations to carry out calculations involving the four operations. **Conditional** • 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.

		• Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. • Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division). • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	different structures, including quotitive and partitive division. • Understand the inverse between addition and subtraction, and know how both relate to the part-part-whole structure. • Estimate the answer to a calculation and use inverse operations to check answers.	• Apply place-value knowledge to known additive and multiplicative number facts (scaling by 100). • Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication. • Understand and apply the distributive property of multiplication. • Estimate and use inverse operations to check answers to a calculation.	**Conditional** • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. • Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes. • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. • Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth). • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.	

Fractions

- Declarative- knowing what
- Procedural- knowing how

Conditional- knowing when and why

Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Declarative • 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.	**Declarative** • Recognise, find, name and write fractions 1/3 , 1/4 ,2/4 and 3/4 of a length, shape, set of objects or quantity • Recognise the equivalence of 2/4 and 1/2. • 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 **Procedural** • Write simple fractions for example, 1/2 of 6 = 3	**Declarative** • Recognise fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. • Recognise and show, using diagrams, equivalent fractions with small denominators. • Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts. • Find unit fractions of quantities using known division facts. (multiplication tables fluency). **Procedural** • 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 • Add and subtract fractions with the same denominator within one whole. • Compare and order unit fractions, and fractions with the same denominators. **Conditional** • Solve problems that involve Year 3 declarative and procedural fractions knowledge. • Reason about the location of any fraction within 1 in the linear number system.	**Declarative** • Recognise families of common equivalent fractions • Recognise and write decimal equivalents to 1/4 , 1/2 , 3/4. • Recognise and write decimal equivalents of any number of tenths or hundredths. **Procedural** • Show, using diagrams, families of common equivalent fractions • 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 improper and mixed fractions with the same denominator, including bridging whole numbers.. • Convert mixed numbers to improper fractions and vice versa. • 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. • Compare numbers with the same number of decimal places up to two decimal places. • Round decimals with one decimal place to the nearest whole number. • Round decimals with one decimal place to the nearest whole number. **Conditional** • Solve simple measure and money problems involving fractions and decimals to two decimal places. • Reason about the location of mixed numbers in the linear number system.	**Declarative** • Recognise mixed numbers and improper fractions and write mathematical statements > 1 as a mixed number. • Identify, name and write equivalent fractions of a given fraction, including tenths and hundredths, and understand they have the same position in the linear number system. • Compare and order fractions whose denominators are all multiples of the same number. • Read and write decimal numbers as fractions. • Recall decimal fraction equivalents for 1/2, 1/4, 1/5, and 1/10, and for multiples of these unit fractions. • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. • Read and write numbers with up to three decimal places. • Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal. **Procedural** • Find non-unit fractions of quantities. • Add and subtract fractions with the same denominator and denominators that are multiples of the same number. • Convert from mixed numbers and improper fractions. • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. • Order and compare numbers with up to three decimal places. • Round decimals with two decimal places to the nearest whole number and to one decimal place. **Conditional** • Solve problems involving number up to three decimal places. • Solve problems which require knowing percentage and decimal	**Declarative** • Identify the value of each digit in numbers given to three decimal places. • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. **Procedural** • 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. • Divide proper fractions by whole numbers. • Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 8 3]. • Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places. • Use written division methods in cases where the answer has up to two decimal places. **Conditional** • Solve problems which require answers to be rounded to specified degrees of accuracy.

					equivalents of 1/2, 1/4, 1/5 , 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.	

Measure

- Declarative- knowing what
- Procedural- knowing how

Conditional- knowing when and why

Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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Declarative • Recognise attributes of measure and use vocabulary to describe them. Procedural • Compare continuous quantities • Show an awareness of comparison in estimating and predicting • Recognise the relationship between the size and number of units. • Use units to compare things. Conditional • Experience specific time spans in order to start to develop an overall sense of time. • Use time to sequence events.	**Declarative** • Tell the time to the hour and half past the hour • Recognise and know the value of different denominations of coins and notes. • Recognise and use language relating to dates, including the days of the week, weeks, months and years. **Procedural** • Measure and record: lengths/heights, mass/weight, capacity volume, time. **Conditional** • Compare, describe and solve practical problems for: lengths/heights, mass/weight, capacity volume, time. • Sequence events in chronological order.	**Declarative** • Tell and write the time to five minutes, including quarter past/to the hour. • Know the number of minutes in an hour and the number of hours in a day. • Recognise and use symbols for pounds (£) and pence (p). **Procedural** • Draw the hands on a clock face and write the time to five minutes, including quarter past/to the hour. • Compare and sequence intervals of time. • Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°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 = • Combine amounts of money to make a particular value. • Find different combinations of coins that equal the same amounts of money. **Conditional** • Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change	**Declarative** • 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. • 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. **Procedural** • Record and compare time in terms of minutes, seconds and hours. • Compare the duration of events. • 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. **Conditional** ---	**Declarative** • Add and subtract amounts of money to give change, using both £ and p in practical contexts. **Procedural** • Convert time between analogue and digital 12- and 24-hour clocks. • Convert from hours to minutes; minutes to seconds; years to months; weeks to days. • Convert between different units of measure (for example, kilometre to metre; hour to minutes). • Measure and calculate the perimeter of rectilinear figures (including squares) in centimetres and metres. • Find the perimeter of regular and irregular polygons. • Find the area of rectilinear shapes by counting squares. • Estimate, compare and calculate different measures, including money in pounds and pence. **Conditional** • Solve problems involving converting units of time.	**Declarative** • Convert between different units of metric measure (for example, kilometre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) including using common decimals and fractions. • Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints. **Procedural** • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres. • Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes. • Estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]. **Conditional** • Solve problems involving converting between units of time. • Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	**Declarative** • 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. • 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. **Procedural** • Convert between miles and kilometres. • Calculate the area of parallelograms and triangles. • 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]. **Conditional** • Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.

Geometry

- Declarative- knowing what
- Procedural- knowing how

Conditional- knowing when and why

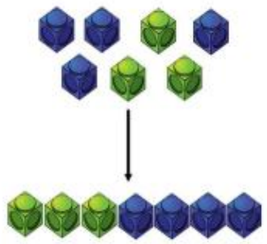
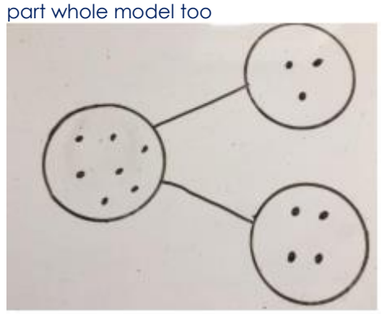
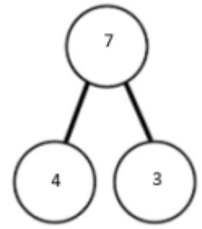
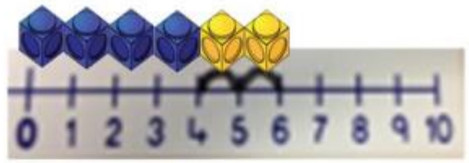
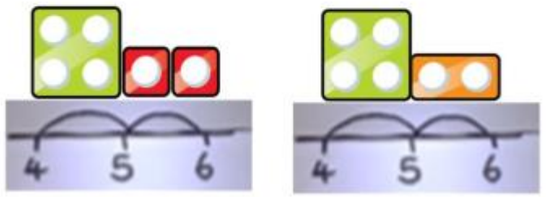
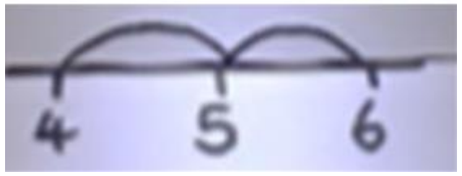
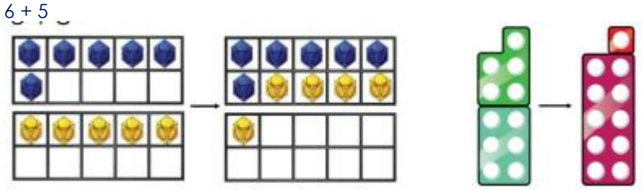
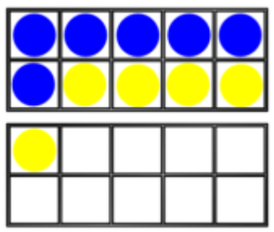
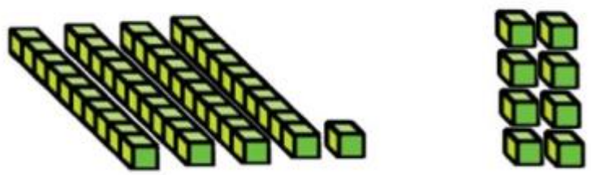
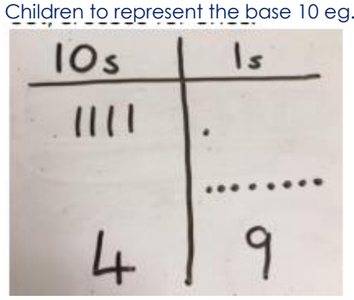
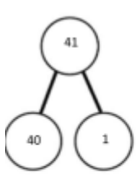
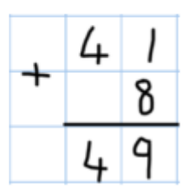
Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					•	
Declarative • Describe properties of shapes. • Develop an awareness of the properties of shape. • Use the language of position and direction. • Explore shapes, the attributes of particular shapes, and select shapes to fulfil a particular need. **Procedural** • Visualise how things will appear when turned around and imagining how things might fit together. • Make constructions, patterns and pictures, and select shapes which will fit when rotated or flipped in insert boards, shape sorters and jigsaws. • Notice the results of rotating and reflecting images, and in visualising them. • Construct and create things that represent objects in their environment. • Notice shape properties of objects that they want to represent and think about the appropriateness of the shapes they choose. • Represent spatial relationships in small world play. • Move both themselves and objects around, so they see things from different perspectives. **Conditional** • in terms of how towers are built and why certain shapes are chosen to make a tower, and the space that has been created within an enclosure.	**Declarative** • Recognise common 2-D shapes: rectangles (including squares, circles and triangles presented in different orientations. • Recognise common 3-D shapes: cuboids (including cubes, pyramids and spheres presented in different orientations. • Know that the above shapes are not always similar to each other. • 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. **Procedural** • Compose 2-D and 3_d shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations. • Make whole, half, quarter and three-quarter turns in both directions. **Conditional** • Connect turning clockwise with movement on a clock face.	**Declarative** • Identify and describe the properties of 2-D shapes using precise language, including the number of sides and line symmetry in a vertical line. • Identify and describe the properties of 3-D shapes using precise language, including the number of edges, vertices and faces • Identify 2-D shapes on the surface of 3-D shapes • 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 anticlockwise). **Procedural** • Compare and sort common 2-D and 3-D shapes and everyday objects. **Conditional** • Compare 2-d and 3-D shapes by reasoning about similarities and differences in properties. • Order and arrange combinations of mathematical objects in patterns and sequences.	**Declarative** • Recognise 3-D shapes in different orientations and describe them. • Recognise angles as a property of shape or a description of turn. • Identify right-angles, recognise that two right-angles make a half-turn, three make three quarters of a turn and four a whole turn. • Identify right angles in 2-D shapes in different orientations. • identify horizontal and vertical lines and pairs of perpendicular and parallel lines. **Procedural** • Draw 2-D shapes and make 3-D shapes using modelling materials. • Identify whether angles are greater than or less than a right-angle. **Conditional** ---	**Declarative** • Identify regular polygons, including equalateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. • Identify acute and obtuse angles. • Describe positions on a 2-D grid as coordinates in the first quadrant. **Procedural** • Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. • Compare and order angles up to two right angles by size. • Identify lines of symmetry in 2-D shapes presented in different orientations. • Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry. • Describe movements between positions as translations of a given unit to the left/right and up/down. • Plot specified points and draw sides to complete a given polygon. • Draw polygons specified by coordinates in the first quadrant, and translate within the first quadrant. **Conditional** ---	**Declarative** • Identify 3-D shapes, including cubes and other cuboids, from 2-D representations. • Know angles are measured in degrees. • Identify: angles at a point and one whole turn (total 360o); angles at a point on a straight line and 1/2 a turn (total 180o); other multiples of 90o. **Procedural** • Estimate and compare acute, obtuse and reflex angles. • Draw given angles, and measure them in degrees (o). • Compare areas and calculate the area of rectangles (including squares) using standard units. • Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. **Conditional** • Use the properties of rectangles to deduce related facts and find missing lengths and angles. • Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.	**Declarative** • Recognise and describe simple 3-D shapes. • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite. • 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). **Procedural** • Draw 2-D shapes using given dimensions and angles. • 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 parts of circles, including radius, diameter and circumference. • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes. **Conditional** ---

Statistics

- Declarative- knowing what
- Procedural- knowing how

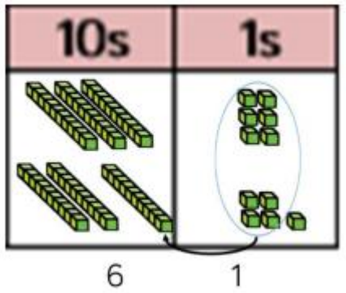
Conditional- knowing when and why

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					•	
	----------	**Declarative** --- **Procedural** • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. **Conditional** • 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.	**Declarative** ------ **Procedural** • Interpret and present data using bar charts, pictograms and tables. **Conditional** • 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.	**Declarative** ------ **Procedural** • Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. **Conditional** • Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	**Declarative** ------ **Procedural** • Complete, read and interpret information in tables, including timetables. **Conditional** • Solve comparison, sum and difference problems using information presented in a line graph.	**Declarative** ------ **Procedural** • Interpret and construct pie charts and line graphs. • Calculate and interpret the mean as an average. **Conditional** • Solve problems from pie charts and line graphs which have been constructed.

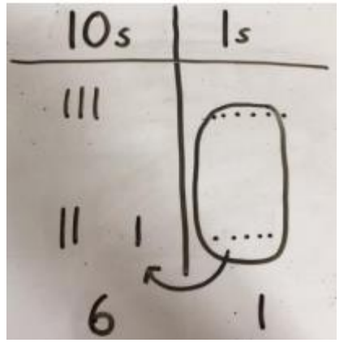
Calculation Policy		
Addition **Key vocab: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', 'is the same as'**		
Concrete	**Pictorial**	**Abstract**
Combining two parts to make a whole (use other resources too eg. Eggs, shells, teddy bears, cars) 	Children to represent cubes using dots or crosses. They could put each part on a part whole model too 	4 + 3 = 7 Four is a part, 3 is a part and the whole is 7 
Counting on using number lines using cubes or numicon  	A bar model which encourages the children to count on rather than count all 	The abstract nuber line: What is 2 more than 4? What is the sum of 2 and 4 What is the total of 4 and 2? 4 + 2 
Regrouping to make 10; using ten frames and counters/ cubes or using numicon 6 + 5 	Children to draw the ten frame and counters/cubes 	Children to develop an understanding of equality eg. 6 + □ = 11 6 + 5 = 5 + □ 6 + 5 = □ + 4
TO + O using base 10. Continue to develop understanding of partitioning and place value 41 + 8 	Children to represent the base 10 eg. Lines for tens and dot/crosses for ones 	41 + 8  1 + 8 = 9 40 + 9 = 49 

TO + TO using base 10. Continue to develop understanding of partitioning and place value

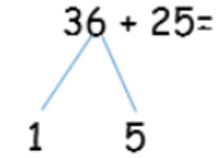
36 + 25



Children to represent the base 10 in a place value chart



Looking for ways to make 10



30 + 20 = 50
5 + 5 = 10
50 + 10 + 1 = 61

Formal method:

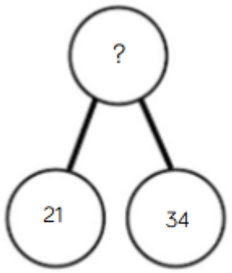
$$\begin{array}{r} 36 \\ +25 \\ \hline 61 \\ \hline 1 \end{array}$$

Use of place value counters to add HTO + TO, HTO + HTO etc. When there are 10 ones in the 1s column- we exchange for 1 ten, when there are 10 tens in the 10s column- we exchange for 1 hundred

Children to represent the counters in a place value chart, circling when they make an exchange

$$\begin{array}{r} 243 \\ +368 \\ \hline 611 \\ \hline 1\ 1 \end{array}$$

Conceptual variation;different ways to ask children to solve 21+ 34



?	
21	34

Word problems:
In Year 3, there are 21 children and in Year 4 there are 34 children.
How many children in total?

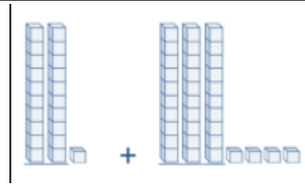
21 + 34 = 55 Prove it

$$\begin{array}{r} 21 \\ +34 \\ \hline \\ \hline \end{array}$$

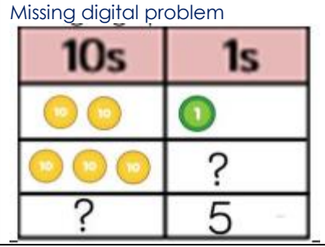
21 + 34 =

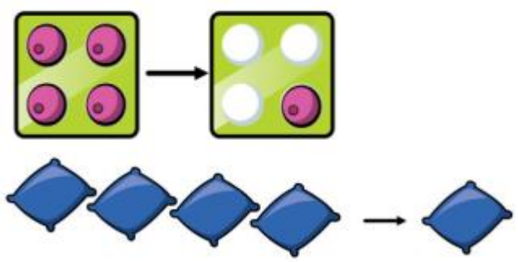
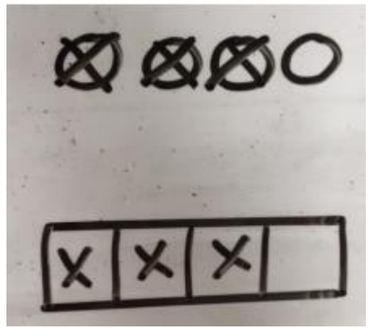
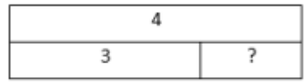
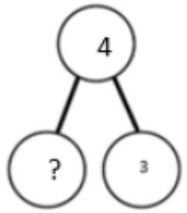
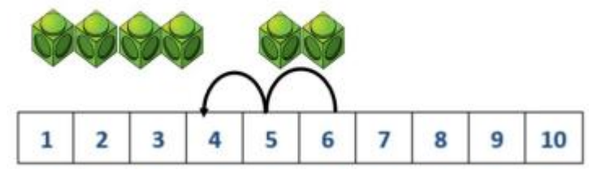
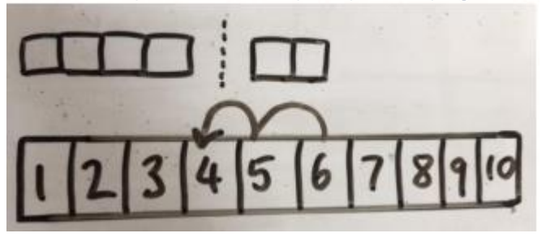
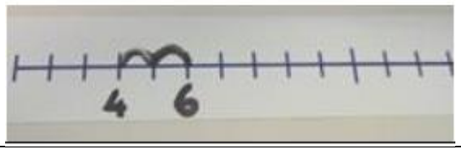
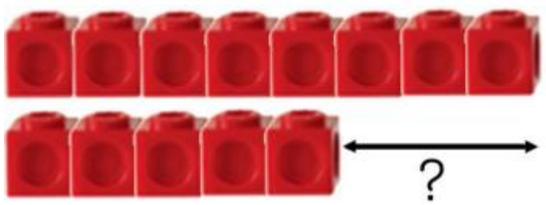
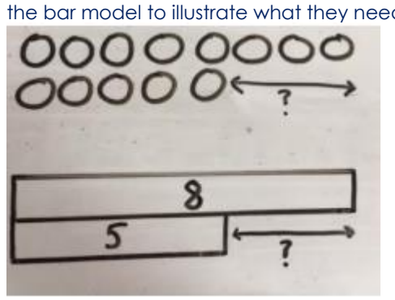
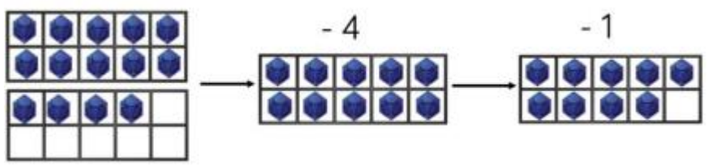
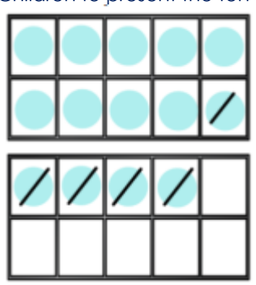
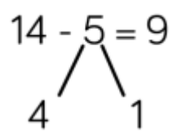
$\square$ = 21 + 34

Calculate the sum of 21 and 34

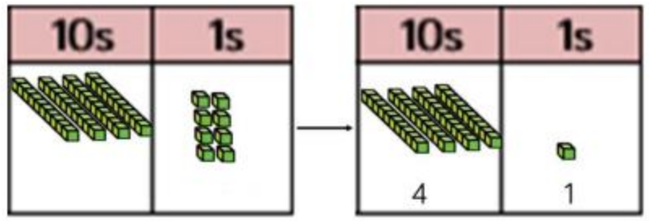


Missing digital problem

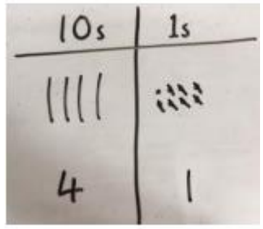


Subtraction Key Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease		
Concrete	**Pictorial**	**Abstract**
Physically taking away and removing objects from a whole (tens frames, numicon, cubes, and other items such as beanbags could be used) 4 – 3 = 1 	Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used 	4- 3 = ☐ = 4 – 3  
Counting back (using number lines or number tracks) children start with 6 and count back 2 6 – 2 = 4 	Children to represent what they see pictorially eg. 	Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty numberline  
Finding the difference (using cubes, numicon or Cuisenaire rods, other objects can also be used) Calculate the difference between 8 and 5 	Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate 	Find the difference between 8 and 5 8 – 5, the difference is _____ Children to explore why 9 – 6 = 8 – 5 = 7 – 4 have the same difference
Making 10 using ten frames 14 -5 	Children to present the ten frame pictorially and discuss what they did to make 10 	Children to show how they can make 10 by partitioning the subtrahend  14 – 4 = 10 10 – 1 = 9

Column method using base 10
48-7



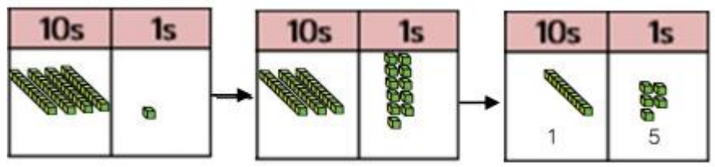
Children to represent the base 10 pictorially



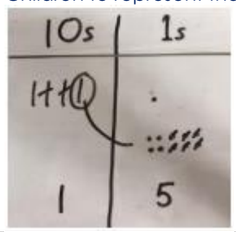
Column method or children could count back 7

	4	8
−		7
	4	1

Column method using base 10 and having to exchange
41-26



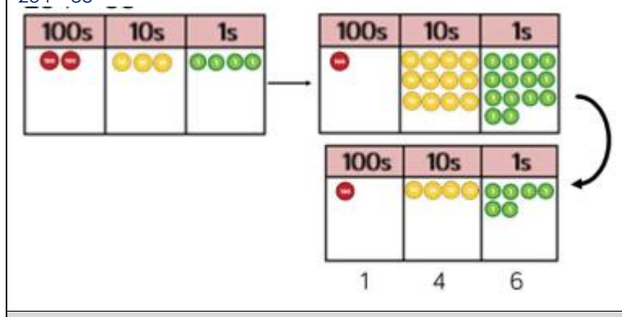
Children to represent the base 10 pictorially remembering to show the exchange



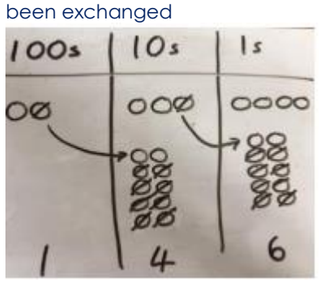
Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because 41 = 30 + 11

	3	1	1
	~~4~~		
−	2	6	
	1	5	

Column method using place value counters
234 – 88



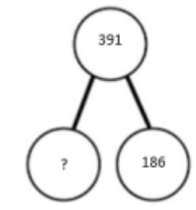
Represent the place value counters pictorially; remembering to show what has been exchanged



Formal column method. Children must understand what has happened when they have crossed out digits

	2	~~3~~	1
	2	3	4
−		8	8
			6

Conceptual variation; different ways to ask children to solve 391 - 186



391	
186	?

Raj spent £391, Timmy spent £186. How much more did Raj spend?

Calculate the difference between 391 and 186

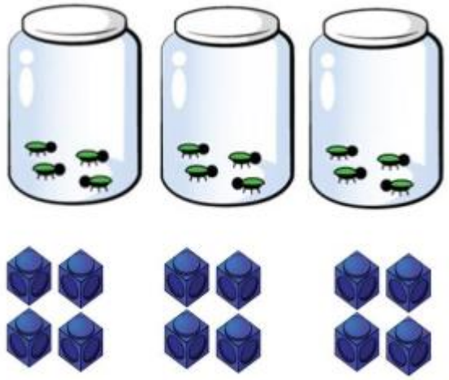
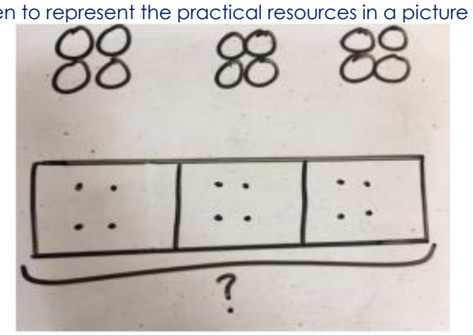
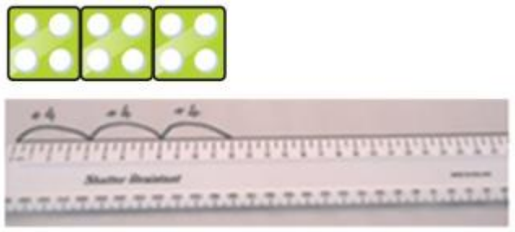
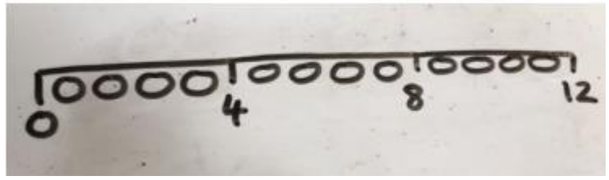
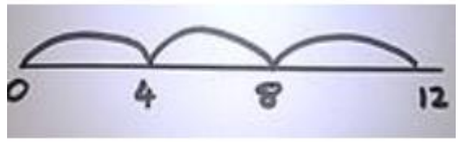
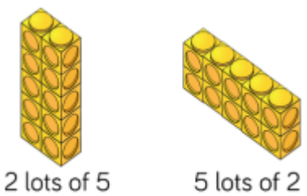
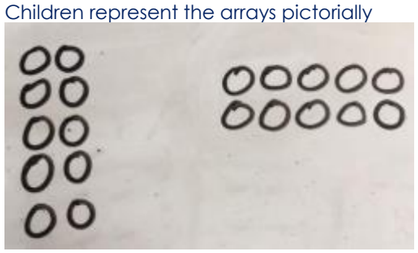
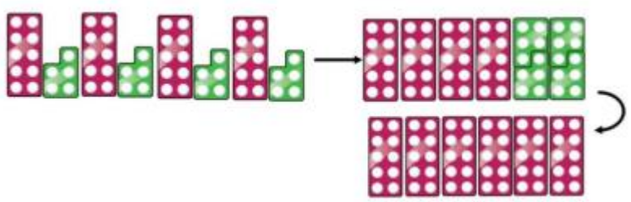
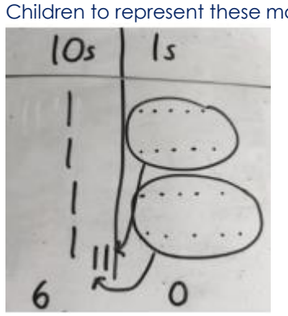
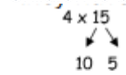
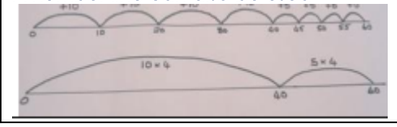
□ = 391 − 186

391
-186
———

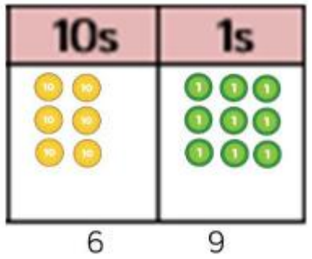
What is 186 less than 391?

Missing digit calculations

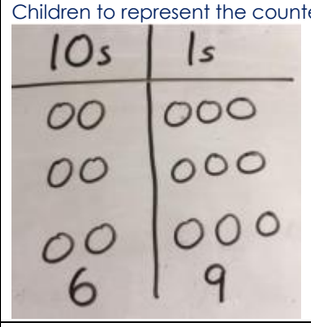
3	9	□
− □	□	6
□	0	5

Multiplication Key Vocabulary: double, times, multiplied by, the product of, groups of, lots of, equal groups		
Concrete	**Pictorial**	**Abstract**
Repeated grouping/ repeated addition 3 x 4 4 + 4 + 4 There are 3 equal groups with 4 in each group 	Children to represent the practical resources in a picture and use a bar model 	3 x 4 = 12 4 + 4 + 4 = 12
Number lines to show repeated groups 3 x 4 	Represent this pictorially alongside a number line eg. 	Abstract number line showing three jumps of four 3 x 4 = 12 
Use arrays to illustrate commutativity counters and other objects can also be used 2 x 5 = 5 x 2 	Children represent the arrays pictorially 	Children to be able to use an array to write a rannnge of calculations eg. 10 = 2 x 5 5 x 2 = 10 2 + 2 + 2 + 2 + 2 = 10 10 = 5 + 5
Partition to multiply using numicon, base 10 or Cuisenaire rods 4 x 15 	Children to represent these manipulatives pictorially 	Children to be encouraged to show the steps they have made  10 x 4 = 40 5 x 4 = 20 40 + 20 = 60 A number line can also be used 

Formal column method with place value counters (base 10 can also be used)
3 x 23



Children to represent the counters pictorially



Children to record what it is they are doing to show their understanding

3×23

$20 \quad 3$

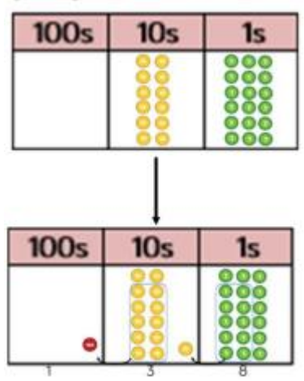
$3 \times 20 = 60$

$3 \times 3 = 9$

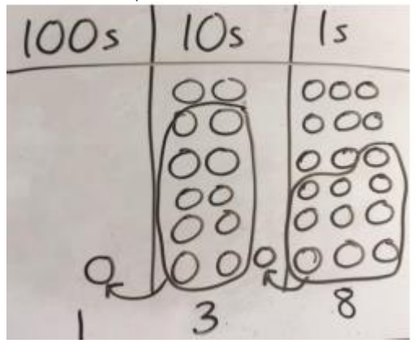
$60 + 9 = 69$

$$\begin{array}{r} 23 \\ \times\ 3 \\ \hline 69 \\ \hline \end{array}$$

Formal method with place value counters and exchanging
6 x 23



Children to represent the counters/ base 10 pictorially



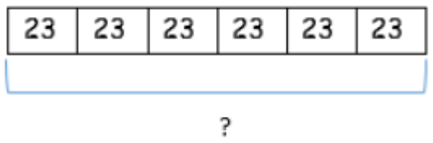
Formal written method

$6 \times 23 =$

$$\begin{array}{r} 23 \\ \times\ 6 \\ \hline 138 \\ \hline 1\ 1 \end{array}$$

$$\begin{array}{r} 1\ 2\ 4 \\ \times\ \ 2\ 6 \\ \hline 7\ 4\ 4 \\ 2\ 4\ 8\ 0 \\ \hline 3\ 2\ 2\ 4 \\ \hline 1\ \ 1 \end{array}$$

Conceptual variation; different ways to ask children to solve 6 x 23



Mai had to swim 23 lengths 6 times in a week.
How many lengths did she swim in one week?

With the counters prove that 6 x 23 = 138

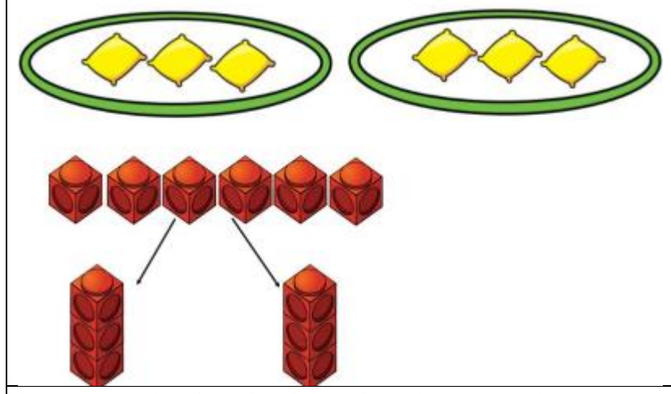
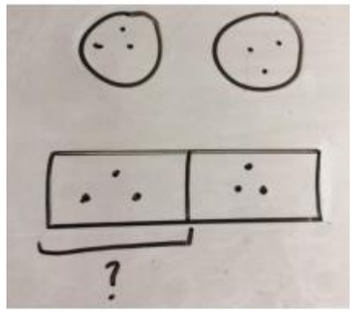
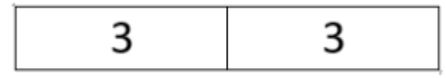
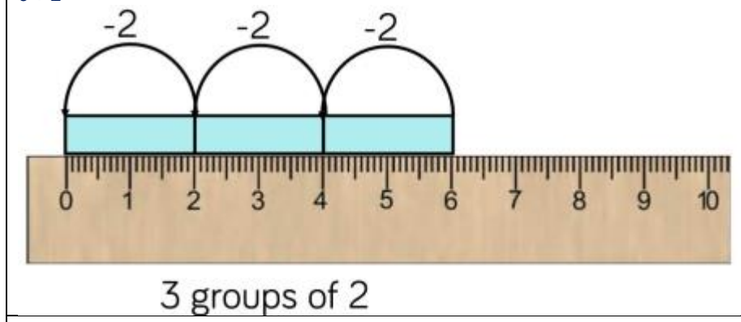
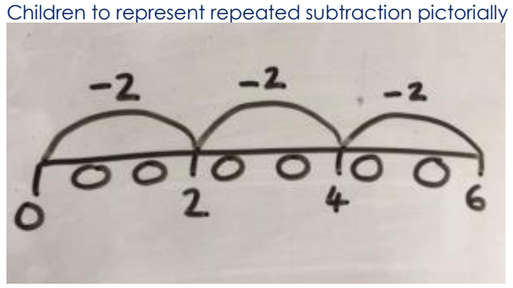
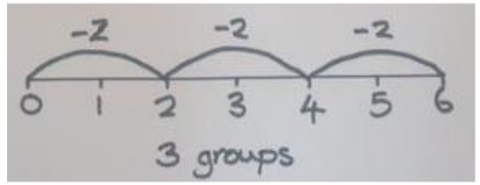
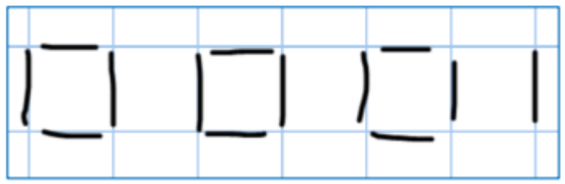
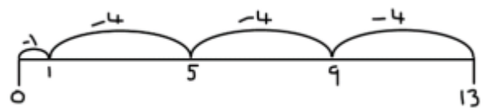
Find the product of 6 and 23

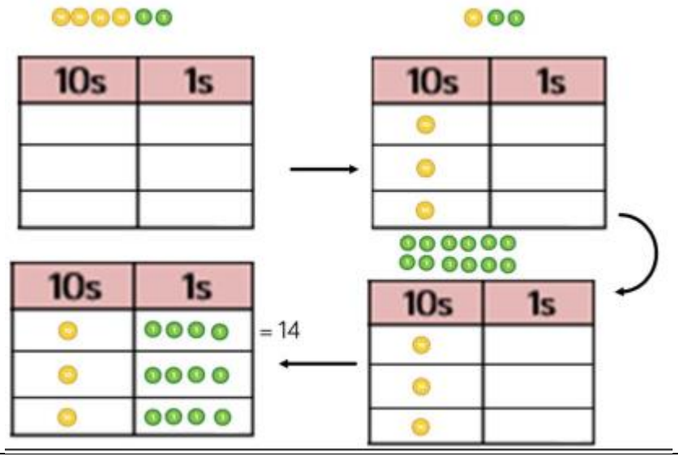
6 x 23

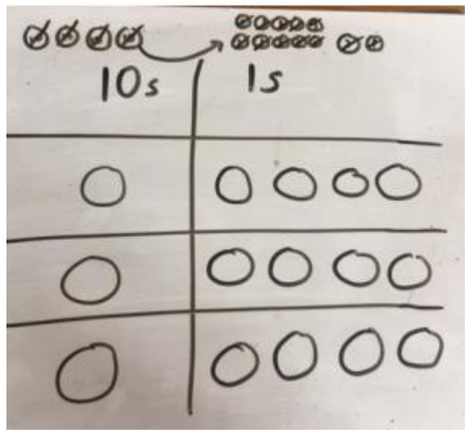
$\square = 6 \times 23$

$$\begin{array}{r} 6 \\ \times\ 23 \\ \hline \\ \hline \end{array} \qquad \begin{array}{r} 23 \\ \times\ 6 \\ \hline \\ \hline \end{array}$$

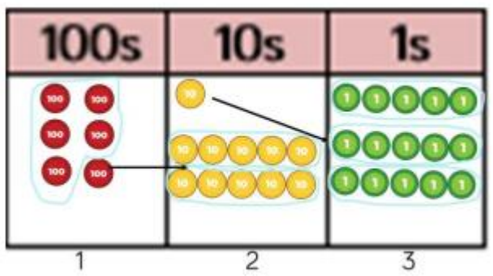
What is the calculation?
What is the product?

Division Key Vocabulary: share, group, divide, divide by, half		
Concrete	**Pictorial**	**Abstract**
Sharing using a range of objects 6 ÷ 2 	Represent the sharing pictorially 	6 ÷ 2 = 3  Children should also be encouraged to use their 2 times tables facts
Repeated subtraction using Cuisenaire rods above a ruler 6 ÷ 2 	Children to represent repeated subtraction pictorially 	Abstract number line to represent the equal groups that have been subtracted 
2d ÷ 1d with remainders using lollipop sticks. Cuisinaire rods above a ruler can also be used 13 ÷ 4 Use of lollypop sticks to form wholes -squares are made because we are dividing by 4  There are 3 whole squares with 1 left over	Children to represent the lollipop sticks pictorially  There are 3 whole squares with 1 left over	13 ÷ 4 = 3 remainder 1 Children should be encouraged to use their times tables facts; they could also represent repeated addition on a number line 3 groups of 4 with 1 left over 
Sharing using place value counters 42 ÷ 3 = 14	Children to represent the place value counters pictorially	Children to be able to make sense of the place value counters and write calculations to show the process 42 ÷ 3 42 = 30 + 12 30 ÷ 3 = 10 12 ÷ 3 = 4 10 + 4 = 14



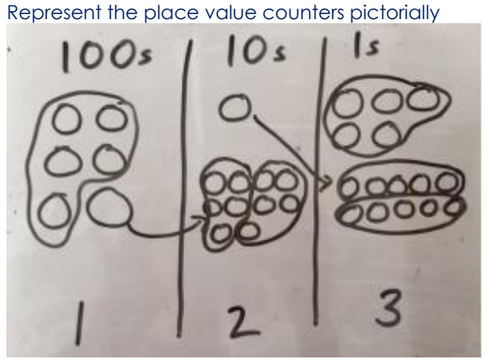


Short division using place value counters to group
615 ÷ 5



1. Make 615 with place value counters
2. How many groups of 5 hundreds can you make with 6 hundred counters
3. Exchange 1 hundred for 10 tens
4. How many groups of 5 tens can you make with 11 ten counters?
5. Exchange 1 ten for 10 ones
6. How many groups of 5 ones can you make with 15 ones?

Represent the place value counters pictorially



Children to solve the calculation using the short division scaffold

$$5\overline{)615}$$

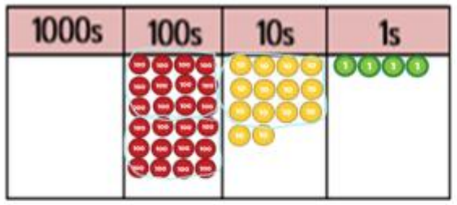
$$\begin{array}{r} 123 \\ 5\overline{)6^{1}1^{1}5} \end{array}$$

Long division using place value counters
2544 ÷ 12

We can't group 2 thousands into groups of 12 so will exchange them.

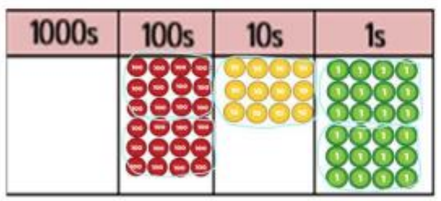
We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

$$\begin{array}{r} 02 \\ 12\overline{)2544} \\ 24 \\ \hline 1 \end{array}$$



After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.

$$\begin{array}{r} 021 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 2 \end{array}$$



After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.

$$\begin{array}{r} 0212 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 24 \\ 24 \\ \hline 0 \end{array}$$

Conceptual variation; different ways to ask children to solve 615 ÷ 5

Using the part whole model below, how can you divide 615 by 5 without using short division?

I have £615 and share it equally between 5 bank accounts. How much will be in each account?

615 pupils need to be put into 5 groups. How many will be in each group?

$$5\overline{)615}$$

615 ÷ 5 =

□ = 615 ÷ 5

What is the calculation?
What is the answer?

SEND Strategies	
	Here is how we will help:
Attention Deficit Hyperactivity Disorder	A non-confrontational approach will be used in every aspect of the maths lesson. Adult support during the key skills and recap sessions where children may be using whiteboards to record their answers. Verbal praise is given whenever necessary to help boost confidence and self-esteem. Use of pictorial representations to support the learning taking place. Use of concrete resources to support new mathematical concepts are part of everyday teaching and learning.
Anxiety	A non-confrontational approach will be used in every aspect of the maths lesson. Adult support during the key skills and recap sessions where children may be using whiteboards to record their answers. Verbal praise is given whenever necessary to help boost confidence and self-esteem. Use of pictorial representations to support the learning taking place. Use of concrete resources to support new mathematical concepts are part of everyday teaching and learning.
Autism Spectrum Disorder	A non-confrontational approach will be used in every aspect of the maths lesson. Adult support during the key skills and recap sessions where children may be using whiteboards to record their answers. Verbal praise is given whenever necessary to help boost confidence and self-esteem. Use of pictorial representations to support the learning taking place. Use of concrete resources to support new mathematical concepts are part of everyday teaching and learning.
Dyscalculia	Concrete resources and manipulatives are always made available and are clearly labelled and accessible Adults will ensure children understand how to use these manipulatives to support the specific learning goal. Key Skills sessions incorporate activities that specifically focus on recall and repeating areas of mathematics the children have already explored Graph paper can be provided for written calculations (i.e. long division). Rulers and highlighters can be used to visually support the drawing/organisation of written calculation methods. Peer and adult support will be built into the lesson throughout to support any corrections with recording dictated numbers/number formation. Peer teaching will be used as a great way of the child sharing new knowledge that has been learnt.
Dyslexia	Different coloured paper can be provided for any written recordings. A text font size of 12 or above is used for any work sheets/PowerPoint presentations. Questions will be short with visual representations (diagrams, pictures, illustrations) to support. Data, charts and diagrams are clearly organised and structured. Specific clear, rounded and spaced out fonts are used on any writing within the lesson. Large spaces for working out will be provided under each question given on a work sheet or in a maths book.
Dyspraxia	A large learning space will be provided. Instructions can be written out for the child, using different colours for each line. Children can move around the classroom whenever necessary. When using mathematical equipment, an adult or supportive peer will provide demonstration of how to successfully use the equipment if required. Adults will ensure they are watching closely for signs of distress and provide a quiet, calm learning environment.
Hearing Impairment	A suitable working space will be agreed upon between the teacher and child in a safe, private conversation before the lesson. Adults within the classroom will ensure the child's hearing aid is turned on before the lesson begins. Adults will ensure they are facing the child when they are talking/giving instructions. Questions and any information given by peers will be repeated clearly to ensure the child has heard what their peers have asked/said. Children will be seated towards the front of the classroom to ensure they have a clear line of vision, especially during the input where the whiteboard will be the main focus
Toileting Issues	Children will be able to leave and return to the classroom whenever necessary. A seating arrangement will be made so that the child can enter and leave the classroom discretely. All adults and children within the classroom environment will respect the child's privacy.
Cognition and learning challenges	Learning is differentiated to meet the child's specific learning needs. This will ensure that the task being given to the child matches their individual academic needs. Concrete resources and visual representations will be given to the child to support any mental and written calculations needed. Self-checks can be used at each stage of a task so that children are aware of the tasks required of them and their achievement of reaching this. Key vocabulary and ideas will be addressed regularly throughout the maths lesson to check understanding. Information will be repeated clearly, varying the vocabulary used.

	SMART pages and PowerPoint slides will be simple and uncluttered with key information highlighted. Children can be provided with a 'work-buddy' during peer activities/opportunities
Speech, Language & Communication Needs	Visual timetables, signs and symbols will be used to support communication within the maths lesson. Visual displays (maths working walls) will be used to support understanding of key information. Non-verbal clues will be used to back up what is being said. Any verbal instructions/information will be at a slow, clear pace that matches the child's understanding. Adults will regularly check the child's understanding so that adults can identify any misconceptions or misunderstandings
Tourette Syndrome	Adults will listen and respond to the child with support and understanding. A structure will be provided (tick list) to support the learning taking place, this will be differentiated to the maths activity and include the main elements needed to aid the child's attention. There will be understanding that the activity may not be completed
Experienced Trauma	The maths learning environment will be a calm, trusting place where children feel supported with their emotions at all times. Adults working with the child will be aware of any triggers and any ways to further support the child within the classroom. There will be a consistent approach to expectations and behaviour that are based on positive praise.
Visual Impairment	Anything that is being displayed (PowerPoint presentation, maths working wall) will be large and easily visible from anywhere in the classroom. Children will be able to 'take a break' from their maths learning whenever needed to ensure they are able to focus visually and avoid fatigue. Images and text within any printed work will be enlarged with the recommended font size. Children will be provided with a thicker and darker pencil to ensure their writing is clear. Children may be provided with a larger squared exercise book if preferred.