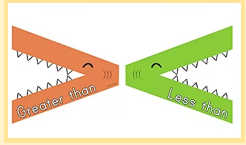
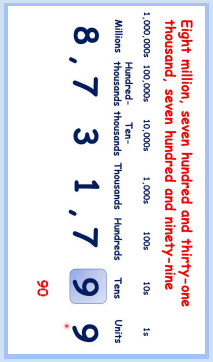
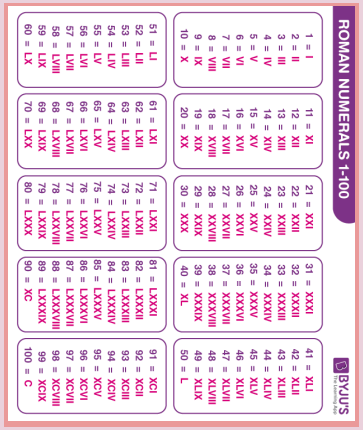
The Echelford Primary School - Maths Progression Document

EYFS
Key Stage 1 ***(Year 1 and 2)***
Lower Key Stage 2 ***(Year 3 and 4)***
Upper Key Stage 2 ***(Year 5 and 6)***

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number Knowledge						
Skills **Knowledge**						
Counts objects, actions and sounds. **Objects can be counted to find a total.** **Able to link the number to the numeral with its cardinal number value.** **Numbers can be represented by amounts. Example: Number 7 will need 7 objects.** **Is able to compare numbers.** **Numbers represent different amounts**	**Count to and across 100, forwards and backwards beginning with 0 or 1, or from a given number** **As we count forward the number and amount increases.** **As we count backwards the number decreases.** **Read and write numbers from 1-20 in numerals and words** **Numbers can be represented using both numerals and words.**	**Count in steps of 2, 3, 5, 0, 10 from any number, forward and backwards** **When we count in 2sn we are adding two more each time.** **Compare and order numbers from 0 up to 100 using signs.** **We can identify more than or less than a number by using signs.**  	**Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.** **When we count in multiples of 4, 8, 50 and 100, we are adding** **Compare and order numbers up to 1,000.** **Numbers represent different values.** **Identify, represent and estimate numbers using different**	**Find 1,000 more or less than a given number** **When we find 1000 more, we add 1000 each time.** **When we find 1000 less, we subtract 1000 each time.** **Count backwards through 0 include negative numbers** **A negative number has a value smaller than zero.** **Order and compare numbers beyond 1,000** **Round any number to the nearest 10, 100 or 1,000** **We round a number to make it simpler keeping its value close**	**Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit.**  **Count forwards or backwards in steps**	**Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.** **Round any whole number to a required degree of accuracy.** **Use negative numbers in context, and calculate intervals across 0.** **An example of a context that uses negative numbers is temperature.** **Solve numbers and**

and some are bigger than others. Is able to subitise a group without counting. Can count beyond 10. Understanding the 'one more than/one less than' relationship between consecutive numbers. When I add one more the number is getting bigger. When I take one away the number is smaller.	Count, read and write numbers to 100 in numerals; count in 2s, 5s, and 10s When we count in 2s the number increases by 2 each time. When we count in 5s the number increases by 5 each time. When we count in 10s the number increases by 10 each time. Identify and represent numbers using objects and pictorial representations. Numbers can be represented by different objects and examples. Given a number, identify 1 more and 1 less	Identify, represent and estimate numbers using different representations, including the number line. Estimating means we roughly calculate the value, quantity or number. Numbers can be represented using a range of different resources.	representations. Read and write numbers up to 1,000 in numerals and in words. The numbers 105 can also be written as one hundred and five. Solve number problems and practical problems involving these ideas. We use our knowledge to apply an efficient strategy to solve problems.	to what it was. Read Roman numerals to 100 and know that over  Identify, represent and estimate numbers using different representations. Solve number and practical problems involve all the above with increasingly large positive numbers.	of powers of 10 for any given number up to 1,000,000. A power of 10 is ten multiplied by itself a certain number of times. |		
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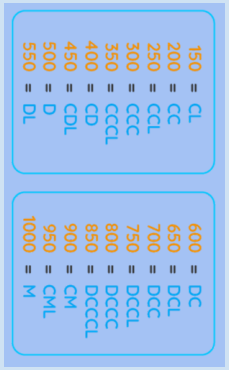
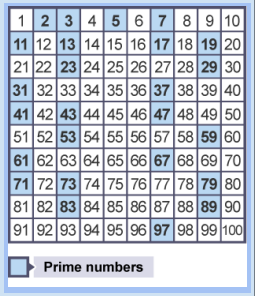
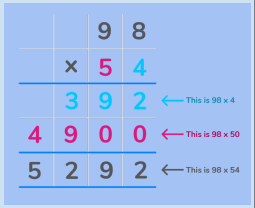
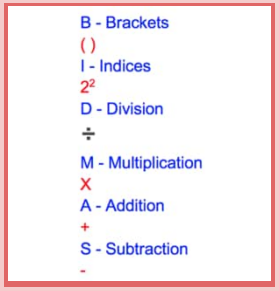
One	1	10^0
Ten	10	10^1
Hundred	100	10^2
Thousand	1,000	10^3
Ten Thousand	10,000	10^4
Hundred Thousand	100,000	10^5
Million	1,000,000	10^6
Ten Million	10,000,000	10^7
Hundred Million	100,000,000	10^8	 Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0. Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000. Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	practical problems that involve all of the above.

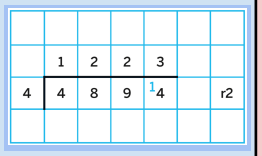
					 **Solve number problems and practical problems that involve all of the above.**	
Addition and Subtraction						
Skills **Knowledge**						
Is able to explore the composition of numbers to 10. **You can add amounts together to make the number 10.** **Automatically recalls number bonds for numbers 0-5 and some to 10.** **A number bond are pairs of numbers that can be added together to make another number.**	**Solve one-step problems that involve addition and subtraction using objects and pictorial representations, and missing number problems such as 7 = ? - 9** **Problems can be solved using a range of different resources. I follow steps to solve each equation.** **Read, write and interpret**	**Solve addition and subtraction problems involving missing number** **The numbers within an equation help us to find the missing number.** **Solve problems with addition and subtraction using concrete objects and pictorial**	**Add and subtract numbers mentally, including a three-digit number and 1s.** **Adding one more means the number increased by 1.** **Subtracting one more each time means the number decreases by 1.** **When we add and subtract numbers**	**Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.** **Solve addition and subtraction two-step problems in context deciding which operations and methods to use and why** **A two-step problem requires more than one operation to find the answer.** **A problem in context relates to**	**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.** **Use rounding to check answers to calculations and determine, in the**	**Use their knowledge of the order of operations to carry out calculations involving the 4 operations.** **Order of operations means we complete our calculation in a particular order using BIDMAS.** **Brackets** **Indices** **Division** **Multiplication** **Addition** **Subtraction.**

	mathematical statements involving addition, subtraction and equals signs Add and subtract one-digit and two-digit numbers to 20, including 0. When we add numbers together the whole amount will increase. When we subtract two numbers the whole amount will decrease.	representations, including those involving numbers, quantities and measures When we solve problems our resources help us to find the answer. Recall and use addition and subtraction facts to 20 fluently and derive and use related facts to 100. My number bonds to 20 help me to solve problems related to numbers up to 100. Solve problems with addition and subtract applying their increasing knowledge of mental and written methods. Add and subtract using objects and mentally including 2 two digit numbers and 3 one digit numbers. My number knowledge helps me to mentally	mentally, we give an answer to the question without having to write down each step of our working out. We need to regroup if the numbers in the ones column total to more than 10. Add and subtract numbers mentally, including a three-digit number and 10s. Adding ten more each time means the number increases by 10 each time. Add and subtract numbers mentally, including a three-digit number and 100s. My numbers bonds and number knowledge helps me to add and subtract three-digit numbers. Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition	real life situations. Estimate and use inverse operations to check answers to a calculation	context of a problem, levels of accuracy. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. A multi-step problem requires more than one operation to find the answer.	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. Solve problems involving addition and subtraction. Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. Perform mental calculations, including with mixed operations and large numbers.

		solve addition and subtraction problems. Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. The inverse operation helps me to check that the answer is correct. Inverse means opposite.	and subtraction. When we use the formal columnar method, the numbers to be added or subtracted are set out above one another in columns. Estimate the answer to a calculation and use inverse operations to check answers. Estimating means we roughly calculate the value, quantity or number. Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.			
Multiplication and Division						

Skills **Knowledge**						
	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. Problems can be solved using a range of resources and representations.	**Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in context** **Repeated addition helps me to solve multiplication problems.** **Show that multiplication of 2 numbers can be done in any order and division of 1 number by another cannot** **Changing the order of the multiplication equation does not change the product. You cannot change the order of a division equation.** **Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication,**	**Recall and use multiplication and division facts for the 3, 4 and 8x multiplication tables.** **My numbers bonds help me to add and subtract three-digit numbers.** **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.** **My multiplication statements help me to solve equations.** **Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence**	**Recall multiplication and division facts for multiplication tables up to 12 x 12** **Recognise and use factor pairs and commutativity in mental calculations** **A factor is an integer that divides exactly into a whole number without a remainder. Eg, 3 is a factor of 12.** **Factor pairs are 2 integers that multiply together to give the product. E.g, 3 multiplied by 4 is 12.** **Solve problems involving multiplying and adding, including using distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as objects n are connected to m objects** Distributive Law 5 x (2 + 3) = 5 x 5 = 25 is the same as 5 x 2 + 5 x 3 = 10 + 15 = 25 **Use place value known derived facts to multiply and divide mentally, including: Multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers**	**Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers.** **A common factor is a factor that is shared by two or more numbers.** **Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.** **A prime number is a number that is only made up of 2 factors, itself and 1. Eg, 19** **A prime factor is a factor that is also a prime number.** **A composite number is any number that is not prime.** **Establish whether a number up to 100 is prime and recall prime numbers up to 19.**	**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.** 1 - 24 2 - 48 3 - 72 4 - 96 5 - 120 6 - 144 7 - 168 8 - 192 9 - 216 543 24|13032 -120 103 -96 72 -72 **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**

		division and equals signs.  The multiplication sign means lots of and the division sign is used between two numbers to show that the first number has to be divided by the second.	problems in which n objects are connected to m objects.	When you divide by 1, the answer stays the same Any number multiplied by 0 is 0. Multiply two-digit numbers by a one-digit number using formal written layout Multiply the 1 digits together first. Cross-multiply by multiplying diagonal digits, then add the two sums together. Multiply the 2-digit numbers. Combine the answers to reach your final answer. Count in multiples of 6, 7, 9, 25 and 1,000 Counting in multiples of 6 means the number is increasing by 6 each time. Counting in multiples of 7 means the number is increasing by 7 each time. Counting in multiples of 9 means the number is increasing by 9 each time. Counting in multiples of 25 means the number is increasing by 25 each time. Counting in multiples of 1000 means the number is increasing by 1000 each time. Solve addition and subtraction, multiplication and	 Multiply numbers up to 4 digits by a one- or two-digit number using formal written method, including long multiplication for two-digit numbers.  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.	calculations, including with mixed operations and large numbers. Identify common factors, common multiples and prime numbers. Use their knowledge of the order of operations to carry out calculations involving the 4 operations.  Solve problems involving multiplication and division. Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. Estimating in maths is a way of approximately calculating an answer (getting a 'rough answer') to check its accuracy (the 'right answer').

				division problems that involve missing numbers **Work backwards through a problem to find out which numbers are missing.**	 **Multiply and divide whole numbers and those involving decimals by 10, 100, 1000.** **When we multiply by 10, 100 and 1000, the digits all move together, one, two, or three place value columns to the left.** **When we divide by 10, 100 and 1000, the digits all move together, one, two, or three place value columns to the right.** **Recognise and use square numbers and cube numbers, and the notation for squared and cubed.** **A square number is a number that has been multiplied by itself.** **A cube number is a number that has been multiplied by itself twice.** **Eg, 2 x 2 x 2** **Solve problems involving**	

					multiplication and division, including using their knowledge of factors and multiples, squares and cubes. **Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.** **The equals sign indicates when 2 numbers or sets of numbers are equal.** **Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.**	
Fractions						
Skills **Knowledge**						
Recalling number bonds to 10 including double facts.	**Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity**	**Recognise, find, name and write fractions 1/3 , 1/4., 2/4, ¾ of a length, shape, set of objects or quantity**	**Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in**	**Recognise and show, using diagrams families of common equivalent fractions**	**Compare and order fractions whose denominators are all multiples of the same number.**	**Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.**

Double means 2.

To double a number you need to add the same number twice.

E.G. Double 2 is 2+2

Investigating, composing and decomposing shapes and recognising a shape can have other shapes within.

One half is represented by 2 equal parts.

To find one half of an object, shape or quantity each part must be of the same value.

Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity

One quarter is represented by 4 equal parts.

To find one quarter of an object, shape of quantity each part must be of the same value

One third is represented by 3 equal parts.

Two quarters is two equal parts of a whole that is 4.

Three quarters is three equal parts of a whole that is 4.

Write simple fractions, for example ½ of 6 = 3 and recognise the equivalence of 2/4 and ½

Fractions show parts of a whole.

One half is equal to two quarters because the numerator is half of the denominator.

dividing one-digit numbers or quantities by 10.

Division is when you take a number, a value or a group of things and separate them into equal parts.

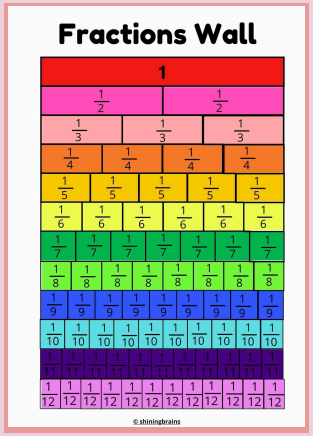
Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.

Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.

To find a unit fraction of an amount, you divide the total amount into equal groups.

Recognise and show, using diagrams, equivalent fractions with small denominators.

Add and subtract fractions with the same denominator within one whole



Count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10.

A tenth is represented as 1/10.

A hundredth is represented as 1/100.

One hundredth is ten times smaller than one tenth.

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

Finding one half of a given number is the same as dividing the number by 2.

Finding one quarter of a given number is the same as dividing the number by 4.

To compare and order fractions with different denominators, we must use our knowledge of common multiples to compare and order fractions.

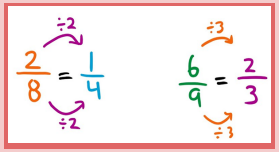
Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.

Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 = 1 1/5].

A mixed number consists of a whole number and a fraction.

An improper fraction is a type of fraction where the numerator is equal to or larger than the denominator.

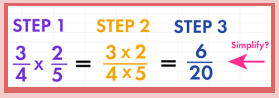
Add and subtract fractions with the same denominator, and denominators that are multiples of



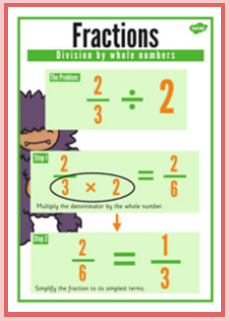
Compare and order fractions, including fractions >1.

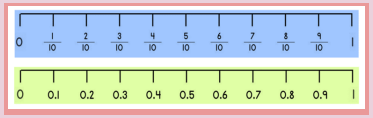
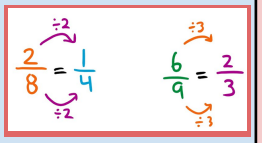
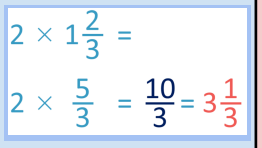
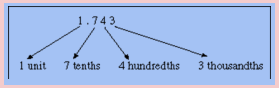
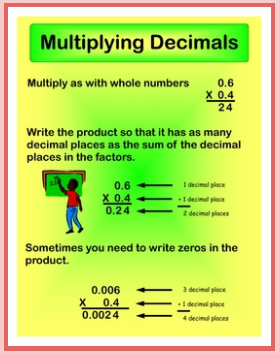
Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

Multiply simple pairs of proper fractions, writing the answer in its simplest form (for example, 1/4 x 1/2 = 1/8).



Divide proper fractions by whole numbers (for example, 1/3 / 2 = 1/6).



			[for example, 5/7 + 1/7 = 6/7]. To add fractions with the same denominator, the denominator stays the same and you add the numerators together. Compare and order unit fractions, and fractions with the same denominators. A unit fraction is a positive fraction with one as its numerator. Solve fraction problems.	Finding a non-unit quantity of a given number means you need to divide by the denominator and then multiply by the numerator. Recognise and write decimal equivalents of any number of tenths or hundredths   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 When you divide by 10, move all the digits one place to the right. When you divide by 100, move all the digits two places to the right. Compare numbers with the same number of decimals places up to 2 decimal places To compare two decimal numbers, you must look at each place value digit in turn,	the same number. To add or subtract fractions with denominator that are multiples of the same number, you need to make the denominators equal through multiplying or dividing.  Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.  Read and write decimal numbers as fractions [for example, 0.71 = 71/100]. Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place. Recognise and use thousandths and relate them to tenths,	Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8]. When converting a fraction to a decimal you need to divide the numerator by the denominator. Identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places.  Multiply one-digit numbers with up to 2 decimal places by whole numbers. 

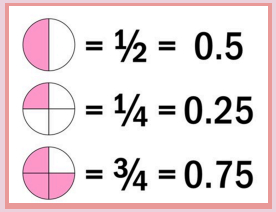
starting with those on the left as they have the highest value.

Compare the digits in the same place value column to compare numbers and work out which is greater.

Add and subtract fractions with the same denominator

When adding or subtracting fractions with the same denominators, we just add or subtract the numerators

Recognise and write decimal equivalent to ¼, ½, ¾



Round decimals with 1 decimal place to the nearest whole number

Solve simple measures and money problems involving fractions and decimals to 2 decimal places.

Solve problems involving the calculator of percentages for example measures such as 15% of 360. Use percentages for comparison

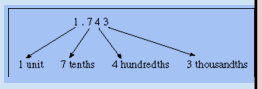
Percentage means 'out of 100'. To find a given percentage, we divide by 100 to find 1%.

hundredths and decimal equivalents.

1/10 is one tenth of 1/100. To find 1/10 you divide by 10. To find 1/100 you divide by 100.

Solve problems involving number up to 3 decimal places.

Read, write, order and compare numbers with up to 3 decimal places.

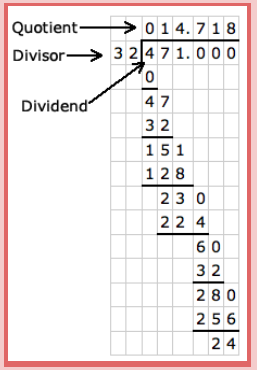


Solve problems which require knowing percentage and decimal equivalents of 1/2, 1/2, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.

Fractions	Decimals	Percentages
$\frac{1}{2}$	0.5	50%
$\frac{1}{3}$	$0.\dot{3}$	$33.\dot{3}\%$
$\frac{2}{3}$	$0.\dot{6}$	$66.\dot{6}\%$
$\frac{1}{4}$	0.25	25%
$\frac{3}{4}$	0.75	75%
$\frac{1}{5}$	0.2	20%
$\frac{1}{10}$	0.1	10%
$\frac{1}{20}$	0.05	5%
$\frac{1}{100}$	0.01	1%

Recognise the percent symbol (%) and understand that

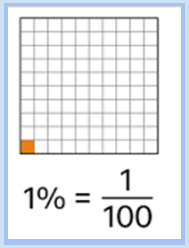
Use written division methods in cases where the answer has up to 2 decimal places.



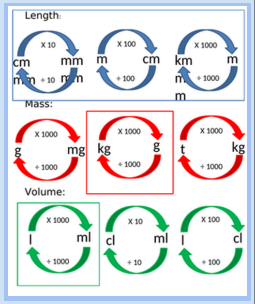
Solve problems which require answers to be rounded to specified degrees of accuracy.

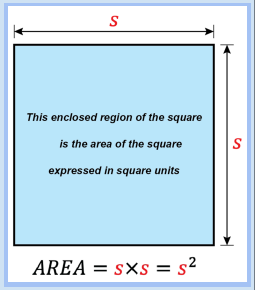
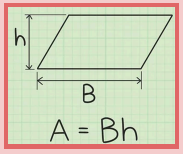
Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

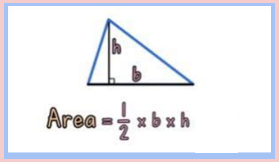
Fraction	Decimal	Percentage
1/2	0.5	50%
1/4	0.25	25%
3/4	0.75	75%
1/5	0.2	20%
2/5	0.4	40%
3/5	0.6	60%
4/5	0.8	80%
1/10	0.1	10%

				Solve problems involving sharing and grouping using knowledge of fractions and multiples	**per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction.**  	
Place Value						
Skills **Knowledge**						
Is able to continue, copy and create repeating patterns. **Patterns continue to create a sequence.**		**Use place value and number facts to solve problems** **Place value is the value of each digit within a number.**	**Recognise the place value of each digit in a 3-digit number (100s, 10s, 1s).** **Place value is the value of each digit within a number. For example, in the number 627, the 6 is 600 (hundreds),.**			
Time						
Skills **Knowledge**						
	Compare, describe and solve practical problems for time	**Compare and sequence intervals of time.**	**Tell and write the time from an analogue clock, including using**	Solve problems involving converting from hours to minutes, minutes to seconds and years to months, weeks to days.		

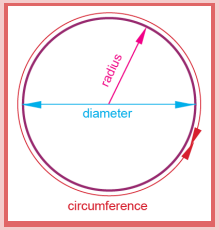
	Measure and begin to record time in hours, minutes and seconds **There are 60 seconds in one minute. There are 60 minutes in 1 hour.** Sequence events in chronological order using language Recognise and use **language relating to dates, including days of the week, months and years.** **Each year has 12 months.** **There are 7 days in the week.** **Monday is before Tuesday and after sunday** **Tell the time to hour and half past the hour and draw the hands on a clock face to show these times.** **The big hand represents the minutes and the small hand shows us the hour.**	**Know the number of minutes in an hour and the number of hours in a day.** **There are 60 minutes in an hour and 24 hours in a day.** **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.** **The big hand represents the minutes and the small hand shows us the hour.**	**Roman numerals from I to XII, and 12-hour and 24-hour clocks.** **The 12-hour clock runs from 1am to noon and then from 1pm to midnight. The 24-hour clock runs from 00:00 (midnight) to 23:59.** **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, am/pm, 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.** **All months have 30 or 31 days, except for February which has 28 days (29 in a leap year). Compare durations**	**There are 60 minutes in one hour and 60 seconds in one minute.** Read, write and convert time between analogue digit 12 and 24 hour clocks. **The 12-hour clock runs from 1am to noon and then from 1pm to midnight. The 24-hour clock runs from 00:00 (midnight) to 23:59.**		

			of events [for example, to calculate the time taken by particular events or tasks].			
Measures						
Skills **Knowledge**						
Can compare length, weight and capacity. Objects that are heavy will tip the weighing scales down. A cup is full when the liquid has reached the top. A cup is empty when there is nothing inside. We can measure objects using rulers, objects and our hands or feet.	**Compare, describe and solve practical problems for mass/weight.** **Compare, describe and solve practical problems for capacity and volume.** **Compare, describe and solve practical problems for lengths and heights.** **I use rulers, metre sticks and other non-standard units to measure objects.** **Measure and begin to record lengths and heights**	**Compare and order lengths, mass, volume/capacity.** **Choose and use appropriate standard units to estimate and measure length/ height in any direction, mass, temperature, capacity to the nearest unit.** **We use standard units to measure quantities accurately** **These include length/height (cm/m)** **Mass (g/kg)** **Temperature (°C)**	**Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).** **Measure the perimeter of simple 2-D shapes.** **The perimeter of any 2D shape can be found by labelling and adding together each side.**	Convert between different units of measures. Measure and calculated the perimeter of a rectilinear figure including squares in cm and m **A rectilinear shape is a 2D, flat shape that has straight sides. All of the sides meet at right angles (angles that are 90 degrees).** Find the area of a rectilinear shapes by counting squares	**Convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre].**  **Understand and use approximate equivalences between metric units**	**Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate.** **Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places.** **Convert between miles and kilometres.**

					and common imperial units such as inches, pounds and pints. Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres. Calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm^2) and square metres (m^2), and estimate the area of irregular shapes.  Estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]. Volume is the amount of space a 3-D shape takes up.	 Recognise that shapes with the same areas can have different perimeters and vice versa. The formula for calculating the area of a shape is length times width times height (LxWxH). The formula for calculating premier is length time height (LxH). Recognise when it is possible to use formulae for area and volume of shapes. Calculate the area of parallelograms and triangles. The area of a parallelogram is calculated using the following formula:  The area of a triangle is

					A cubic cm block takes up 1 cubic cm. This is written as 1 cm^3. Capacity is the amount a shape or container can hold. We measure capacity in millilitres (ml) or litres (L). Solve problems involving converting between units of time. There are 60 seconds in one minute, which means 30 seconds is half the time of one minute. There are 60 minutes in 1 hour, which means there are 30 minutes in half an hour. There are 24 hours in one day. Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	calculated using the following formula:  Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3].
Pattern						
Skills **Knowledge**						

		Order and arrange combinations of mathematical objects in patterns and sequences. **A repeated arrangement includes numbers, shapes, colours that continuously repeat.**			**Scaling is used when we are given information about something and then have to apply it to a smaller or larger quantity.**	
Geometry						
Can select, rotate and manipulate shapes in order to develop spatial reasoning skills. **Investigating composition and decomposing shape can have other shapes within it just as a number can.** **A 2- D shape has sides and corners.** **A 3 - D shape has vertices and edges.**	**Recognise and name common 2-D and 3-D shapes** **2D shapes I know include:** **Describe position, direction and movement, including whole half, quarter and three quarter turns**	Identify and describe the properties of 2-D shapes, including number of sides and line symmetry in a vertical line **We describe 2D shapes using the mathematical language side, straight, curved, corner, vertex, right angle, flat, and symmetrical.** **A side is the line segment that joins two vertices in a shape or two-dimensional.**	**Draw 2-D shapes and make 3-D shapes using modelling materials.** **Recognise 3-D shapes in different orientations and describe them.** **Shapes include cylinder, octagonal prism and tetrahedron and shapes may be presented in different orientations.**	**Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes** **A quadrilateral is defined as a two-dimensional shape with four sides, four vertices, and four angles.** **Identify lines of symmetry in 2-D shapes presented in different orientations** **Something is symmetrical when it is the same on both sides. A shape has symmetry if a central dividing line (a mirror line) can be drawn on it, to show that both sides of the shape are exactly the same.**	**Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.** **2-D shapes have only 2 dimensions (height and length).** **3-D shapes have 3 dimensions (length, width and height)** **Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.** **A reflex angle is greater than 180° but**	**Draw 2-D shapes using given dimensions and angles.** **Recognise, describe and build simple 3-D shapes, including making nets.** **Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.** **Angles in a triangle total to 180 degrees.** **Angles in a quadrilateral**

		A corner or vertex is the point where two or more line segments or edges meet. Identify properties of 3-D shapes, including the number of edges, vertices and faces. **A vertex is the point where two or more line segments or edges meet.** **Faces are the flat surface of a solid shape.** **An edge is the line that joins corners or surfaces of a shape.** Compare and sort common 2-D and 3-D shapes and everyday objects	**Recognise angles as a property of shape or a description of a turn.** **Identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 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.** **Parallel lines are the lines that do not intersect at any point and the distance between the two lines is always the same. Perpendicular lines are the lines that intersect each other at right angles (90 degrees).**	**Describe positions on a 2-D grid as coordinates in the first quadrant** **Plot specified points and draw sides complete a given polygon** **Identify acute and obtuse angles and compare and order angles up to 2 right angles by size** **Acute Angle, is less than 90° ; Right Angle, is 90° exactly ; Obtuse Angle, is greater than 90°;.** **Complete a simple symmetric figure with respect to a specific line of symmetry.** **Describe movements between positions as translations of a unit to the left/right and up/down.**	**smaller than 360°.** **Draw given angles, and measure them in degrees (°).** **Identify angles at a point and 1 whole turn (total 360°).** **Identify angles at a point on a straight line and half a turn (total 180°).** **A straight line is exactly 180°. Half a turn is half of 360°.** **Identify other multiples of 90°.** **Other multiples of 90° include:** **450° = 5 x 90°** **540° = 6 x 90°** **630° = 7 x 90°** **Use the properties of rectangles to deduce related facts and find missing lengths and angles.** **A rectangle is a quadrilateral.** **The opposite sides are parallel and equal to each other.** **Each interior angle is equal to 90 degrees.** **The sum of all the interior angles is equal to 360 degrees.**	**total to 360 degrees.** **Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.** **The circumference is the distance all the way around a circle.** **The diameter is the distance right across the middle of the circle.** **The radius is the distance halfway across the centre of the circle.**  **Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.** **Describe positions on the full coordinate grid (all 4 quadrants).** **A four-quadrant grid shows where 2 axes intersect at a right angles.**

					Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. **A regular polygon is a shape with straight sides all of equal length.** **An irregular polygon is a shape with straight sides, but if any of these are of different lengths, the shape is irregular.** **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.** **When a shape is reflected, its size does not change - the image just appears 'flipped'. Every point on the shape is the same distance away on the other side of the mirror line.** **Translation is the word we use when shape is moved up, down, left and right.**	**The four quadrants are labelled – the First Quadrant, the Second Quadrant, the Third Quadrant and finally the Fourth Quadrant.** **Only in the first quadrant will both the x and y co-ordinates be positive.** **Negative co-ordinates will be introduced to positive points in the other three co-ordinates.** **Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.**
Money						

	Recognise and know the value of different denominations of coins and notes	Find different combinations of coins that equal the same amounts of money. Money has different values. Recognise symbols for pounds, pence and combine amounts to make a particular value. Symbols are used to represent the amount a coin is worth. Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change. We can add money together to create a total amount. Use measures to describe position direction and movement including movement in a straight line and rotation as a turn in terms of right angles, quarter, half	Add and subtract amounts of money to give change, using both £ and p in practical contexts.	Estimate, compare and calculate different measures, including money in pounds and pence		

		and three-quarter turns.				
Statistics						
		Interpret and construct simple pictograms, tally charts, block diagrams and tables. Pictograms, charts and diagrams are used to represent data. Ask and answer question about totalling and comparing categorical data	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. Pictograms and tables can be used to solve one and two step questions.	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs Solve comparison, sum and differences problems using information present in bar charts, pictograms, tablets and other graphs	Solve comparison, sum and difference problems using information presented in a line graph. Complete, read and interpret information in tables, including timetables.	Interpret and construct pie charts and line graphs and use these to solve problems. Calculate and interpret the mean as an average.
Algebra						
			Solve addition and subtraction,		Solve addition and subtraction,	Use simple formulae.

			multiplication and division problems that involve missing numbers.		multiplication and division problems that involve missing numbers.	A formula is a group of mathematical symbols and numbers that show how to work something out. Generate and describe linear number sequences. A linear sequence goes from one term to the next by always adding (or subtracting) the same value. Express missing number problems algebraically. Find pairs of numbers that satisfy an equation with two unknowns. To satisfy an equation is when a value solves the equation. Enumerate possibilities of combinations of two variables.
Ratio and Proportion						
						Solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication

						and division facts. Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison. Solve problems involving similar shapes where the scale factor is known or can be found. A scale factor is when you enlarge a shape and each side is multiplied by the same number. Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. Unequal sharing occurs when a quantity is shared unequally among two or more persons. After sharing they receive different amounts