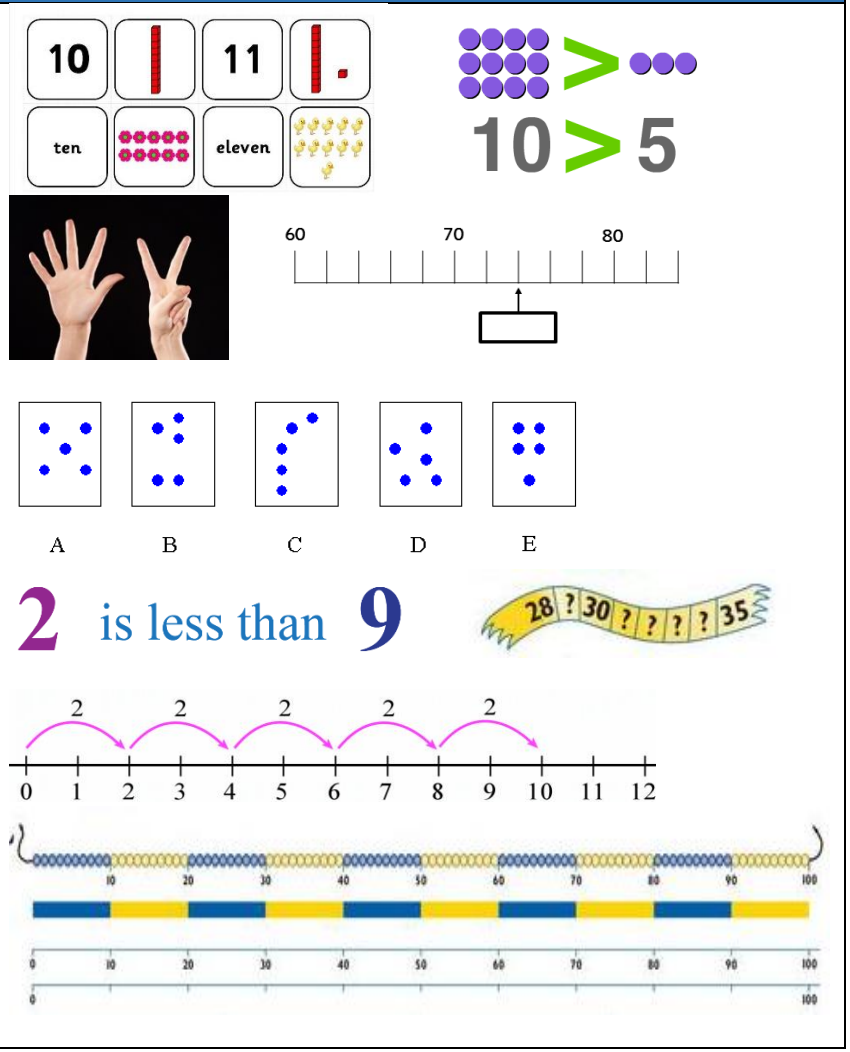
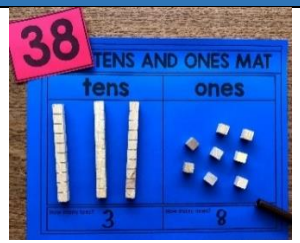
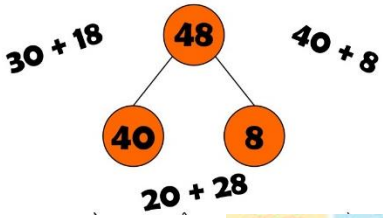
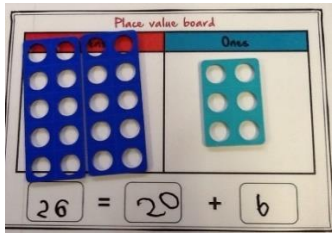
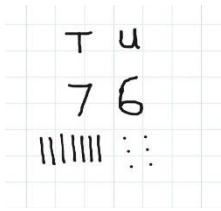
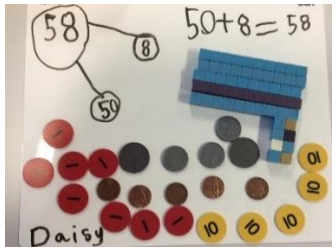
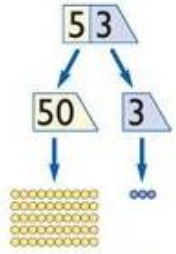
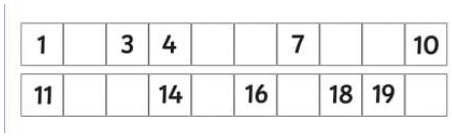
MODELS AND IMAGES TO SUPPORT PROGRESSION IN MATHS

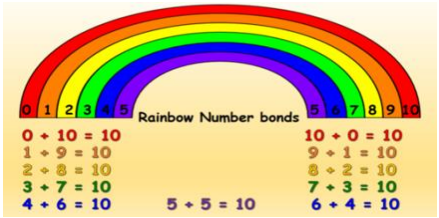
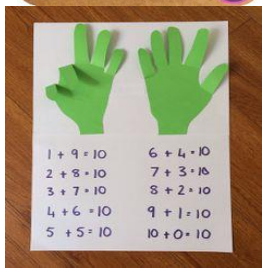
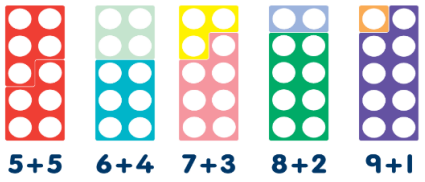
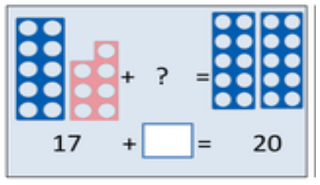
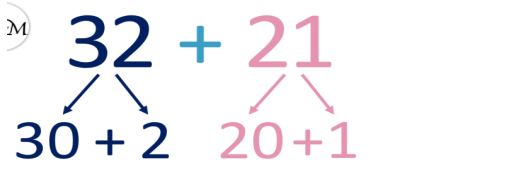
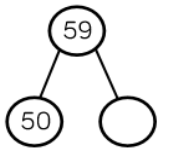
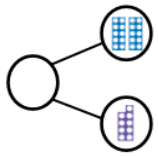
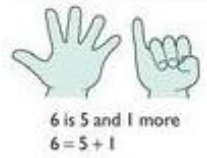
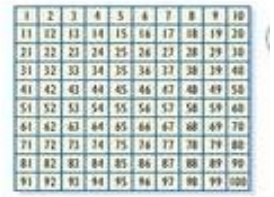
July 2021

The aims of the National curriculum for Maths are that '*pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems' (*Mathematics programmes of study). At Lyndhurst, procedural and conceptual variation is planned for to ensure that children have opportunities to make links with prior knowledge and learning

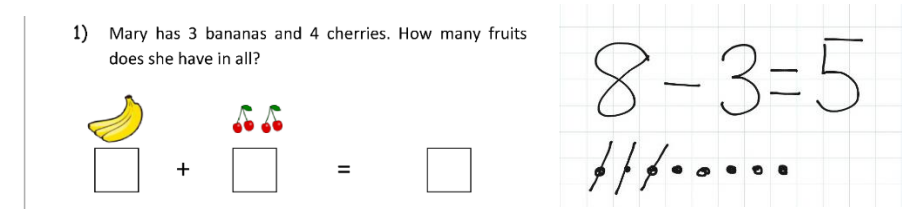
COUNTING			NUMBER AND PLACE VALUE Variation Models and Images
Early Years	Year 1	Year 2	
count reliably with numbers from 1 to 20	count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number		
count objects, actions and sounds	count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	
say which number is one more and one less than a given number (up to 20)	given a number, identify one more and one less (up to 100)		
COMPARING NUMBERS			
understand the 'one more than/one less than' relationship between consecutive numbers	use the language of: equal to, more than, less than (fewer), most, least	compare and order numbers from 0 up to 100; use <, > and = signs	
IDENTIFYING, REPRESENTING AND ESTIMATING NUMBERS			
subitise up to 5 objects	identify and represent numbers using objects and pictorial representations including the number line	identify, represent and estimate numbers using different representations, including the number line	
link the number symbol (numeral) with its cardinal number value			

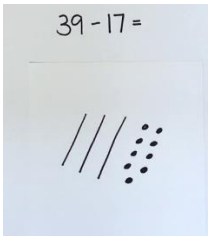


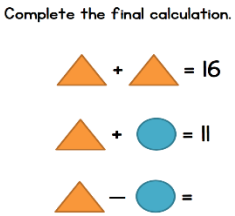
READING AND WRITING NUMBERS			NUMBER AND PLACE VALUE Variation Models and Images
Early Years	Year 1	Year 2	
place numbers 1 – 20 in order	read and write numbers from 1 to 20 in numerals and words	read and write numbers to at least 100 in numerals and in words	 
UNDERSTANDING PLACE VALUE			
	Begin to understand the place value of each digit in a 2-digit number (tens, ones)	recognise the place value of each digit in a two-digit number (tens, ones) *including 0 as a place holder*	  
PROBLEM SOLVING			
	use place value and number facts to solve problems	solve number problems and practical problems involving these ideas	    

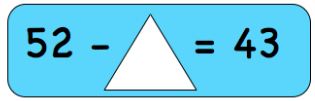
NUMBER BONDS			ADDITION AND SUBTRACTION Variation Models and Images
Early Years	Year 1	Year 2	
explore the composition of numbers to 10 automatically recall number bonds for numbers 0-5 and some to 10	represent and use number bonds and related subtraction facts within 20	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100	 
+ and - CALCULATIONS			 
using quantities and objects, add and subtract two single digit numbers and count on or back to find the answer	add and subtract two-digit numbers and ones *and two digit numbers and tens,* where no regrouping is required using concrete objects and pictorial representations	add and subtract numbers using concrete objects, pictorial representations, and mentally, *including where regrouping is required:* * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers	 
	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (copied from Written Methods)	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot	   
			  

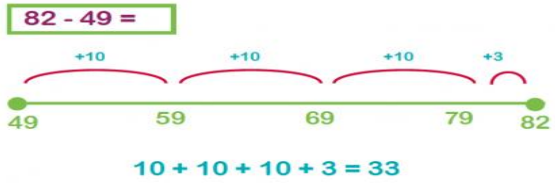
+ AND - WRITTEN METHODS			ADDITION AND SUBTRACTION Variation Models and Images
Early Years	Year 1	Year 2	
	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (copied from Mental Calculation)	recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems	
PROBLEM SOLVING			
	solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9	solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods	

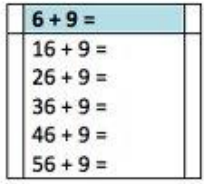


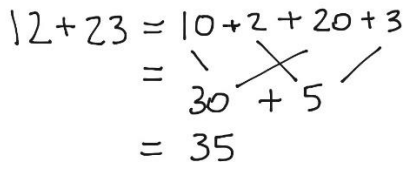


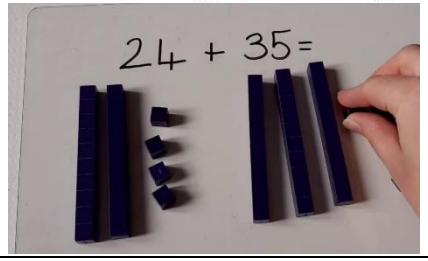






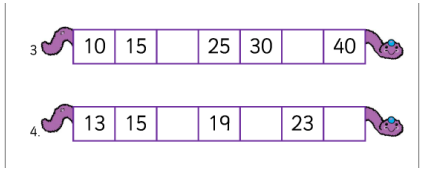




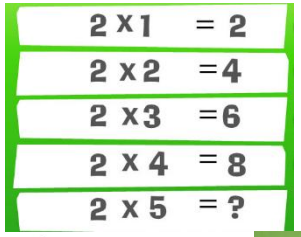


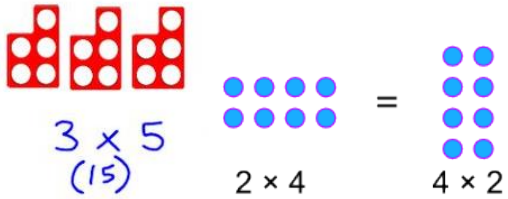
MULTIPLICATION & DIVISION FACTS		
Early Years	Year 1	Year 2
solve problems, including doubling, halving and sharing	count in multiples of twos, fives and tens and use this to solve simple problems	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward
	Understand multiplication as repeated addition and division as sharing	recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
MENTAL CALCULATION		
	Begin to know doubles up to double 10 and corresponding halving facts	show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot *Know doubles up to double 10 and corresponding halving facts*

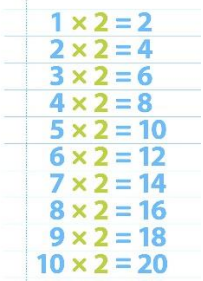
MULTIPLICATION AND DIVISION
Variation Models and Images

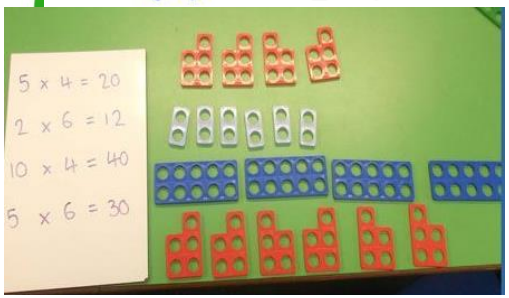


1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

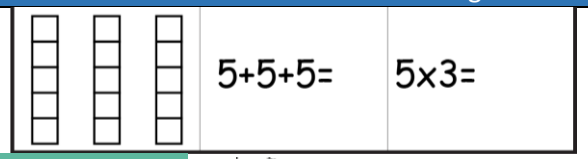


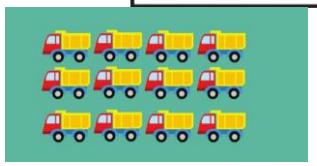


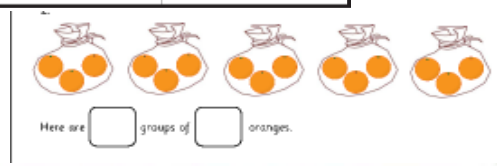


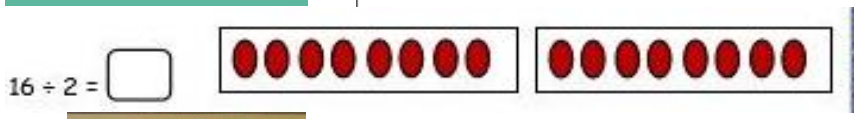


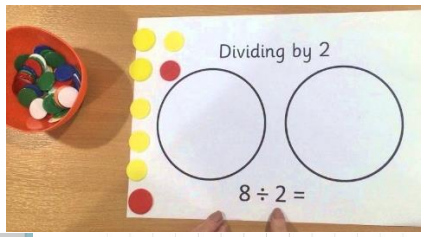
X AND ÷ WRITTEN CALCULATION			MULTIPLICATION AND DIVISION Variation Models and Images
	Year 1	Year 2	
	Begin to understand the multiplication (×), division (÷) and equals (=) signs	calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	
PROBLEM SOLVING			
	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	solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	

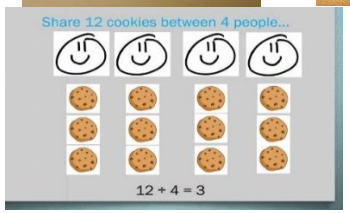


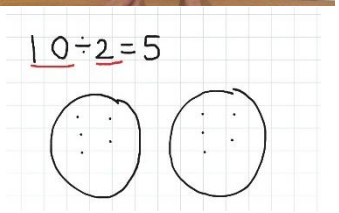


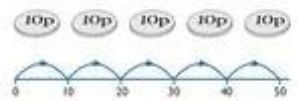


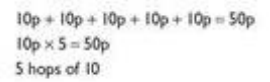


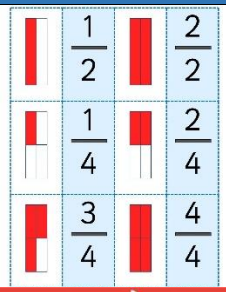
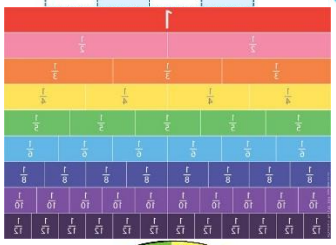
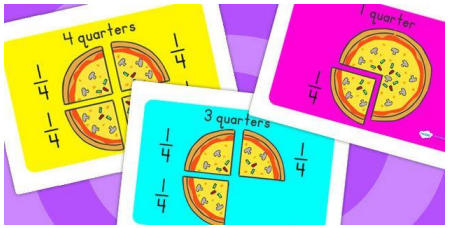
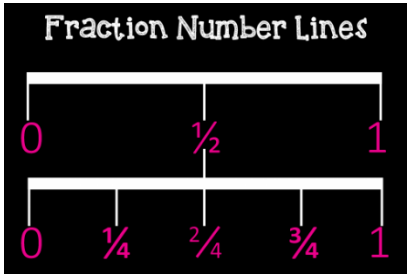
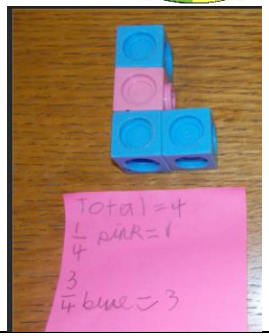
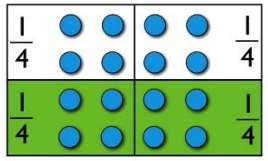


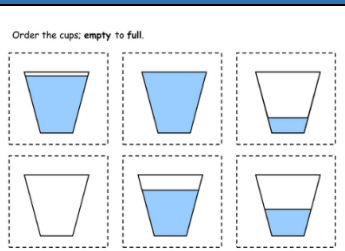
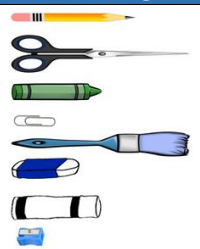
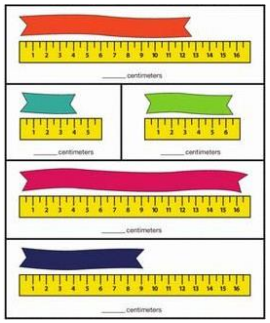
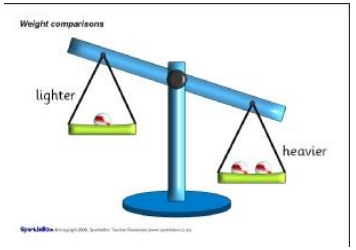
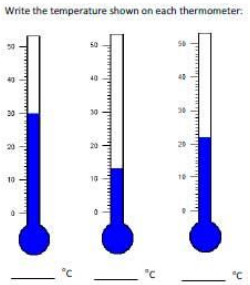


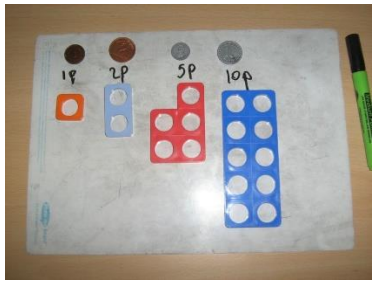


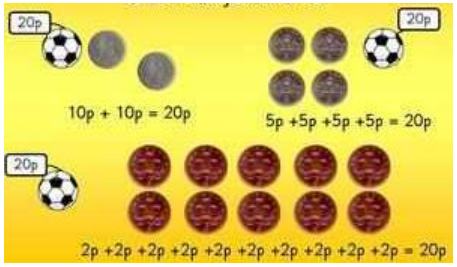




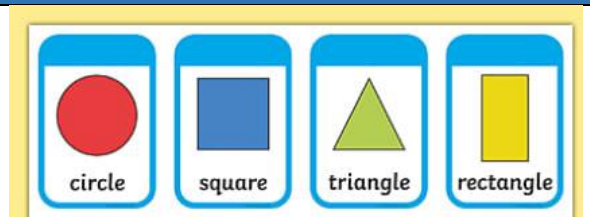
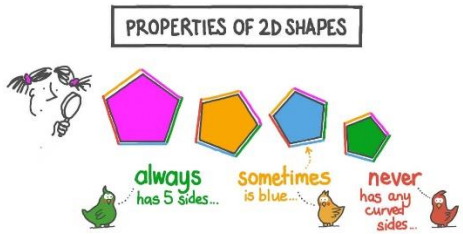
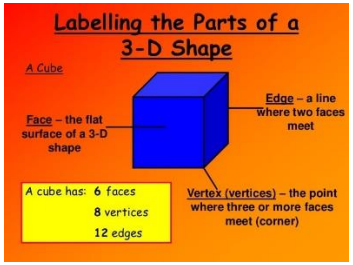
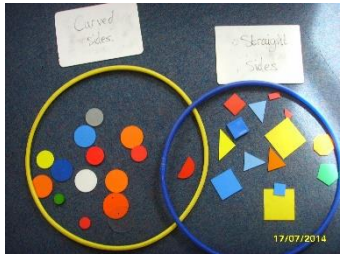
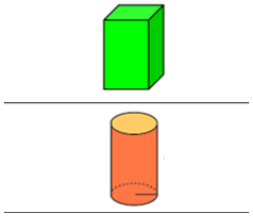
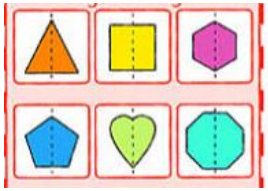
COUNTING IN FRACTIONAL STEPS			FRACTIONS Variation Models and Images
Early Years	Year 1	Year 2	
		Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line	        2/4 of 16 = 8
RECOGNISING FRACTIONS			
	recognise, find and name a half as one of two equal parts of an object, shape or quantity	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, find and name a quarter as one of four equal parts of an object, shape or quantity		
EQUIVALENCE			
		write simple fractions e.g. $^{1}/_{2}$ of 6 = 3 and recognise the equivalence of $^{2}/_{4}$ and $^{1}/_{2}$	

COMPARING AND ESTIMATING			MEASUREMENT Variation Models And Images
Early Years	Year 1	Year 2	
compare length, width and capacity use everyday language to talk about size, weight, capacity and time to compare quantities and objects and to solve problems	compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] * time [e.g. quicker, slower, earlier, later]	compare and order lengths, mass, volume/capacity and record the results using >, < and =	 
	sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]	compare and sequence intervals of time	 
MEASURING and CALCULATING			
	measure and begin to record the following: * **lengths and heights** * **mass/weight** * **capacity and volume** * **time** (hours, minutes, seconds**)**	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	   

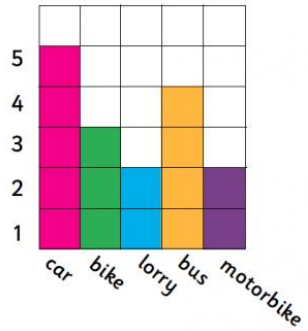
<table>
<tr><th colspan="3">MEASURING and CALCULATING - MONEY</th><th rowspan="2">MEASUREMENT
Variation Models And Images</th></tr>
<tr><th>Early Years</th><th>Year 1</th><th>Year 2</th></tr>
<tr><td rowspan="3">use everyday language to talk about money to compare quantities and objects and to solve problems</td><td rowspan="3">recognise and know the value of different denominations of coins and notes</td><td>recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value</td><td rowspan="4"> 

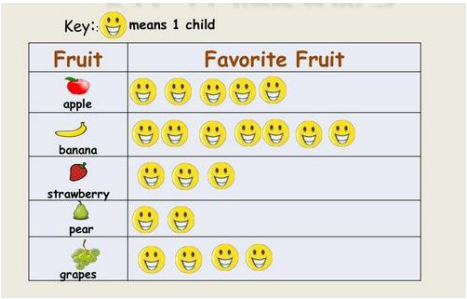


 </td></tr>
<tr><td>find different combinations of coins that equal the same amounts of money</td></tr>
<tr><td>solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</td></tr>
<tr><td colspan="3">TELLING THE TIME</td></tr>
<tr><td rowspan="2">use everyday language to talk about time to compare quantities and objects and to solve problems</td><td>tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.</td><td>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.</td></tr>
<tr><td>recognise and use language relating to dates, including days of the week, weeks, months and years</td><td>know the number of minutes in an hour and the number of hours in a day.</td></tr>
</table>

IDENTIFYING SHAPES AND THIER PROPERTIES			GEOMETRY Variation Models and Images
	Year 1	Year 2	
explore characteristics of everyday objects and shapes and use mathematical language to describe them	recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres]	identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line	
		identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces	
recognise, create and describe patterns		identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]	
		compare and sort common 2-D and 3-D shapes and everyday objects	
POSITION, DIRECTION and MOVEMENT			
use everyday language to talk about position and distance to compare quantities and objects and to solve problems	describe position, direction and movement, including half, quarter and three-quarter turns	use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)	  

INTERPRETING, CONSTRUCTING AND PRESENTING DATA			STATISTICS Variation Models and Images
	Year 1	Year 2	
	Begin to understand a simple tally chart and simple pictograms	interpret and construct simple pictograms, tally charts, block diagrams and simple tables	
	ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity	ask and answer 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	





Method of Travelling	Number of children
Walking	8
Car	9
Bus	4
Cycle	5
Train	1
Taxi	3