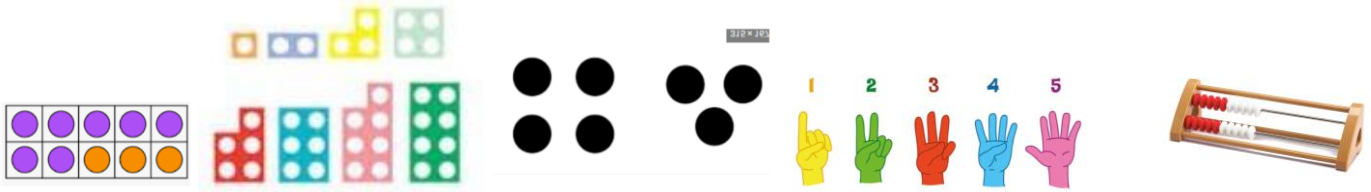
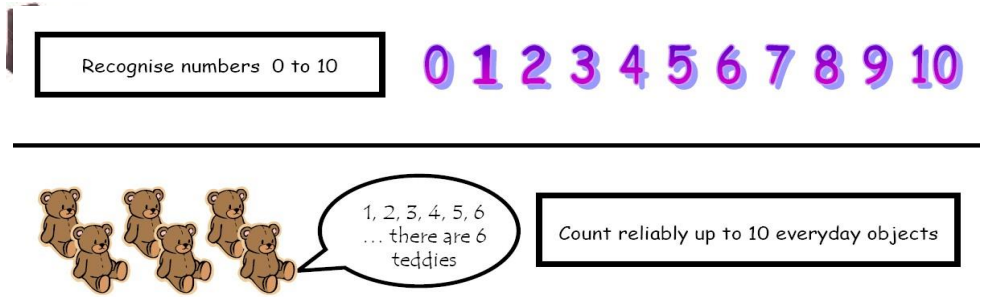
Addition

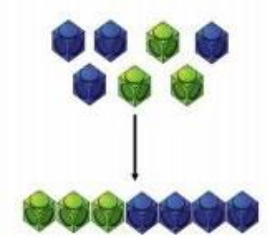
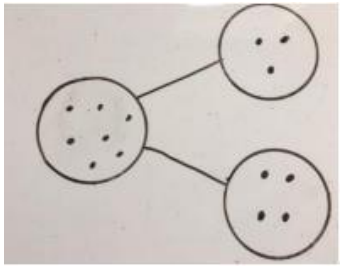
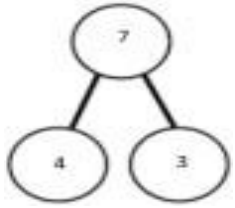
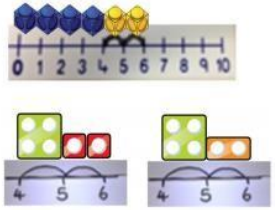
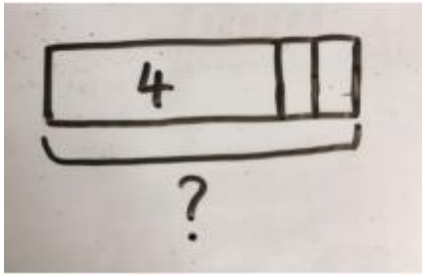
Early Years Foundation Stage

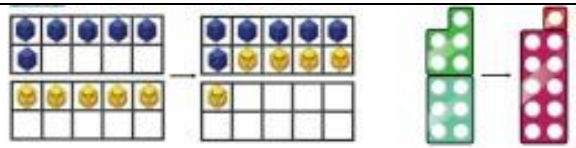
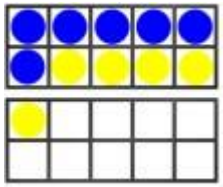
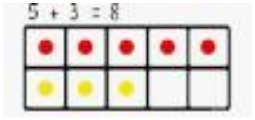
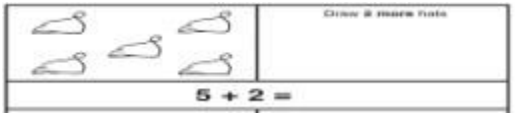
Key Vocabulary: add, more, and, make, sum, total, altogether, is the same as, one more, two more, how many more to make…?

Learning Intentions	Concrete	Pictorial	Abstract
Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). Recite numbers past 5. Say one number for each item in order: 1,2,3,4,5. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle'). Show 'finger numbers' up to 5. Solve real world mathematical problems with numbers up to 5. Compare quantities using language: 'more than' Understand the 'one more than relationship between consecutive numbers Explore the composition of numbers to 10 Automatically recall number bonds for numbers 0-5 and some to 10. including double facts.	Children are encouraged to develop a mental picture of the number system in their heads to use for calculation.Children count forward from different starting points. Children are given opportunities to use counting on during play situations (e.g. How many teddies have come to the picnic?) Children learn songs and rhymes involving counting. Children will be encouraged to mark make to represent their thinking.  A range of resources e.g. dominoes and dice are used to build up a visual representation of numbers. 		

Year One

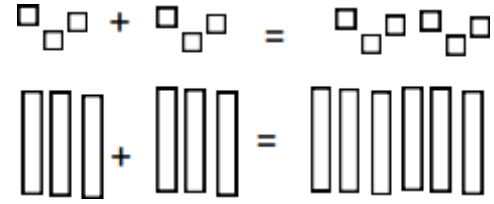
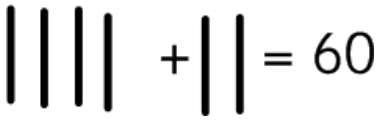
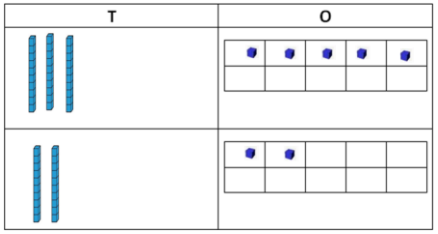
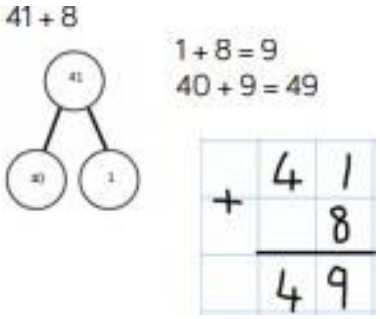
Key Vocabulary: add, more, plus, make, sum, total, altogether, is the same as, equals, balances, sign, one more, two more, ten more, how many more is…? How many more is… than…?

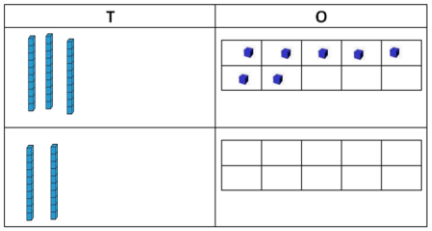
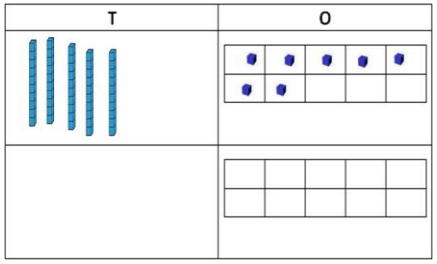
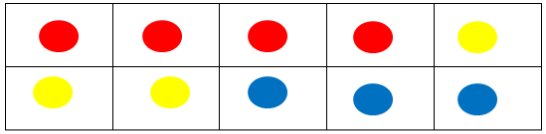
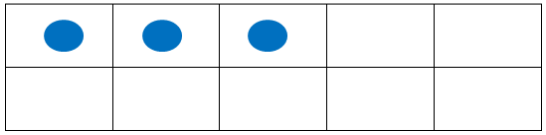
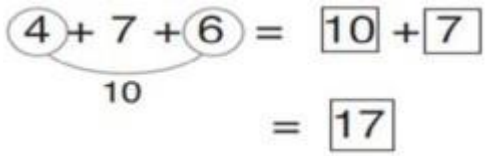
Learning Intentions	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part part whole (PPW) model	Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears, cars). 	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too. 	4 + 3 = 7 4 is a part, 3 is a part and the whole is seven. 
Counting on from the biggest number	Using number lines, cubes or Numicon 	A bar model which encourages the children to count on, rather than count all. 	The abstract number line: What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2 or 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.	7 + 4= 11 If I am at seven, how many more do I need to make 10. How many more do I add on now? Children to develop an understanding of

<table>
<tr>
<td></td>
<td>  </td>
<td>  </td>
<td>equality e.g.
6 + □ = 11
6 + 5 = 5 + □
6 + 5 = □ + 4</td>
</tr>
<tr>
<td>Represent and use number bonds and related subtraction facts within 20</td>
<td>5 +2
 
 
  </td>
<td>4 + 3 = 7
<table><tr><td>X</td><td>X</td><td>X</td><td>X</td><td>0</td></tr><tr><td>0</td><td>0</td><td></td><td></td><td></td></tr></table>
  </td>
<td>Emphasis should be on the language
‘1 more than 5 is equal to 6’
‘2 more than 5 is 7’
‘8 is 3 more than 5’
8 + 2 balances 10</td>
</tr>
</table>

Year Two

Key Vocabulary: add, addition, more, plus, make, sum, total, altogether, is the same as, equals, balances, sign, one more, two more, ten more, how many more is…? How many more is… than…?

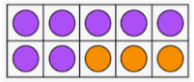
Learning Intentions	Concrete	Pictorial	Abstract
Adding multiples of 10 Using known facts	 	x x x x + x x = 6  4 tens + 2 tens = _____tens 40 + 20 =	I know that 3 + 4 = 7 30 + 40 = 70 20 + 30 = 50 70 = 50 + 20 40 + □ = 60
To add 2-digit to 1-digit 2-digit to ten 2-digit to 2-digit (bridging and not bridging)	Make the biggest number on the place value mat. Then make the next number.  Then add the ones	Children to represent the base 10 e.g. lines for tens and dot/crosses for ones. 	Children add by partitioning  37 + 46 =

	 Then add the tens 		7 + 6 = 13 30 + 40 = 70 Re-combine 70 + 13 = 83 46 + 37 83 1
To add 3 1-digit numbers	  4 + 3 + 6 = Combine to make 10 if possible, bridge 10 and add 3rd digit or use near doubles then add 3rd digit	Combine the two numbers that make/bridge 10 then add on the 3rd 	7 + 5 + 3 = I know 7 + 3 = 10. Then add the 5 it balances 15. 4 + 5 + 4 = I know that double 4 equals 8. Then add 5 more. The answer is 13.

Subtraction

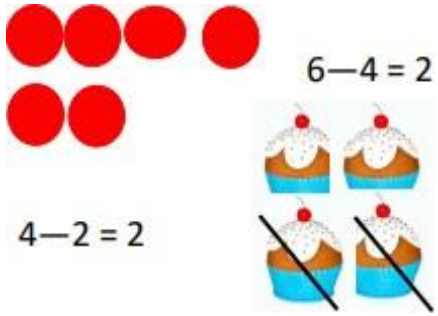
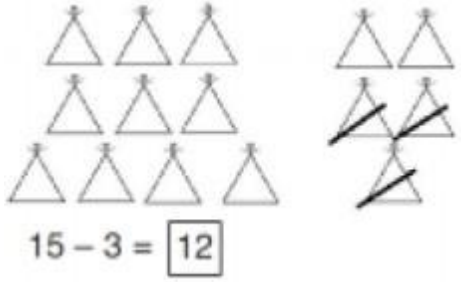
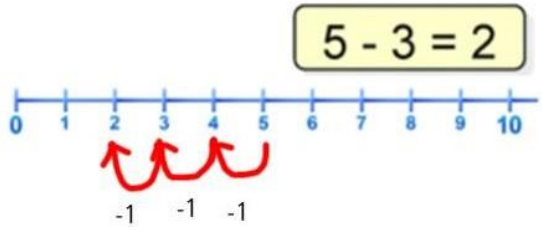
Early Years Foundation Stage

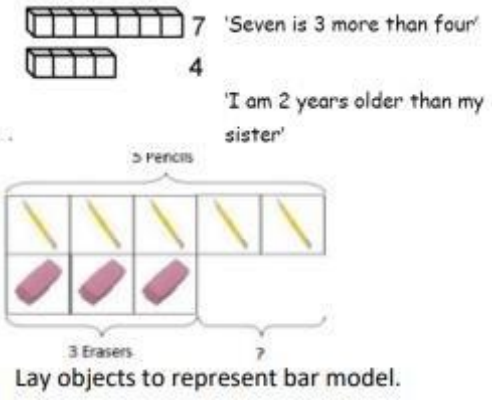
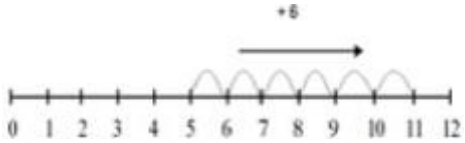
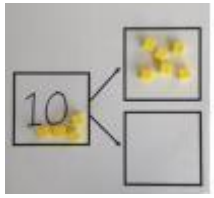
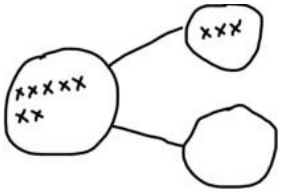
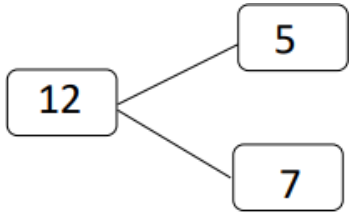
Key Vocabulary: take (away), leave, subtract, how many are left/left over? One less, two less, fewer, difference between, how many have gone?

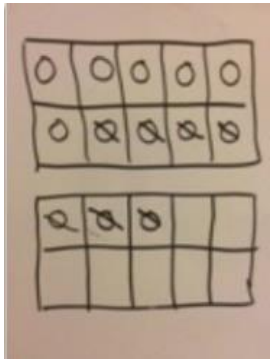
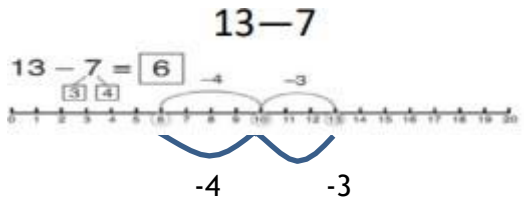
Learning Intentions	Concrete	Pictorial	Abstract
Experiment with their own symbols and marks as well as numerals. Solve real world mathematical problems with numbers up to 5. Compare quantities using language: 'fewer than'. Compare numbers. Understand the 'one less than' relationship between consecutive numbers. Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts)	Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. Children are given opportunities to practise counting backwards in a variety of contexts e.g. by jumping on an outdoor number line, learning songs and rhymes. Children are introduced to the concept of difference through play. E.g. Who has the fewest? How many fewer do you have?     		

Year One

Key Vocabulary: subtract, take (away), minus, leave, how many are left/left over? How many are gone? One less, two less, ten less, how many fewer is…than…? How much less is..? difference between, is the same as, equals, balance, sign

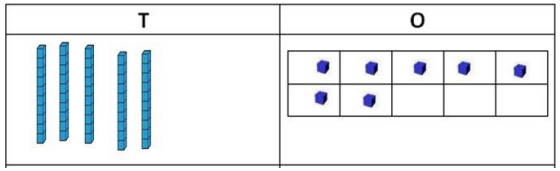
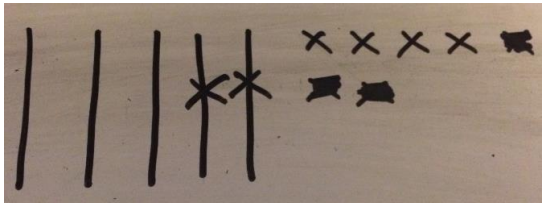
Learning Intentions	Concrete	Pictorial	Abstract
Taking away ones *Must ensure that children are ready to use the - sign	Physically taking away and removing objects from a whole (ten frames, Numicon, cubes and other items such as beanbags could be used).  	Cross out drawn objects to show what has been taken away.  	7—4 = 3 16—9 = 7
Counting back	Moves objects away from group counting back  Move the beads back along the beadstring as you count backwards	Count back in ones using the number line  	Put 13 in your head, count back 4. What number are you at?

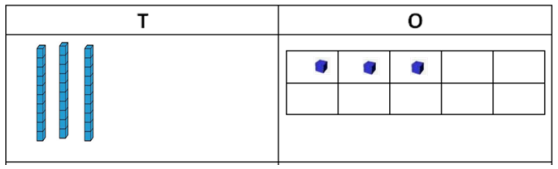
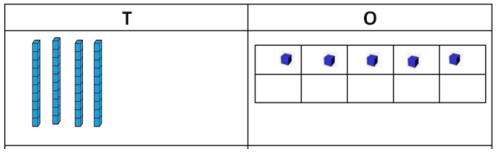
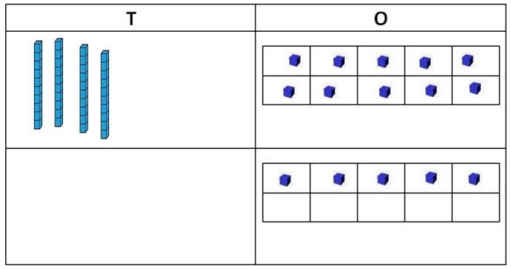
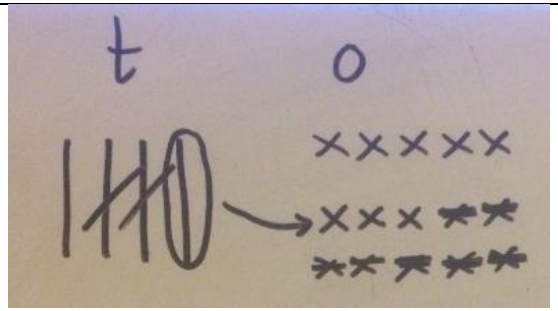
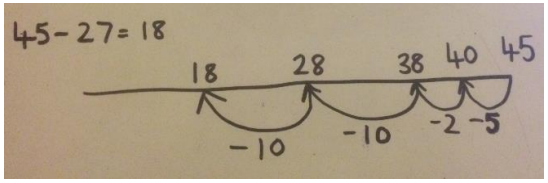
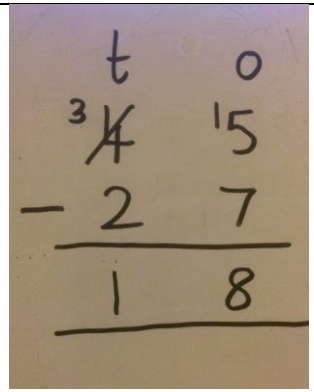
			
Finding the difference	Compare different amounts  Lay objects to represent bar model.	Count on using the number line to find the difference 	Hannah has 12 sweets and her sister has 5. How many more does Hannah have than her sister? 12 – 5 = 7
Represent and use number bonds and related subtraction facts within 20	Link to addition by using the PPW to model the inverse  If 10 is the whole and 6 is one of the parts. What is the other part? 10 – 6 = 4	Use pictorial representations to show the part. 	Move to using number within the PPW model 

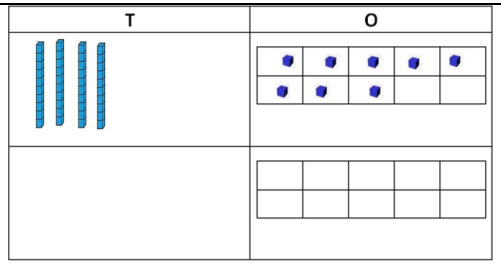
Make 10	Make 14 on the ten frame. Take 4 away to make ten. Then take one more away so that you have taken 5. 	Draw the 10 frame and use crosses for ones. Then cross out 3. Then cross out 4. 	

Year Two

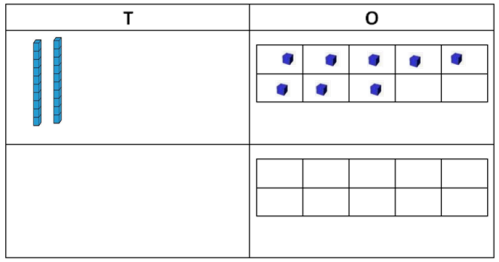
Key Vocabulary: subtract, take (away), minus, leave, how many are left/left over? How many are gone? One less, two less, ten less, how many fewer is…than…? How much less is..? difference between, is the same as, equals, balance, sign

Learning Intentions	**Concrete**	**Pictorial**	**Abstract**
To subtract without bridging ten (no re-groupng)	57 – 24 =  Children to use the Dienes to make the biggest number. Then physically remove. Always taking away the ones first. Then minus the tens. Then		57 – 24 = 33 7 – 4 = 3 50 – 20 = 30 30 + 3 = 33

	recombine  		57 −24 33 x
To subtract when bridging ten (re-grouping)	45 – 27 = Begin by making 45 using the Dienes.  Because there are not enough ones to subtract from, then exchange a ten for ten ones. Then there will be 3 tens +15 ones  Then subtract the ones	  	



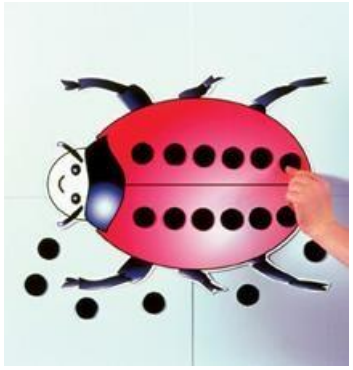
Then takeaway the tens and recombine



Multiplication

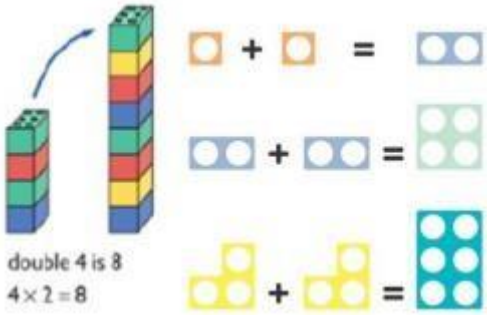
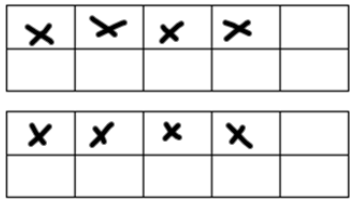
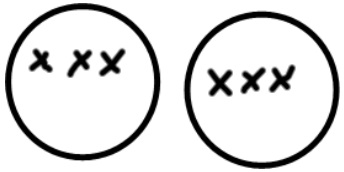
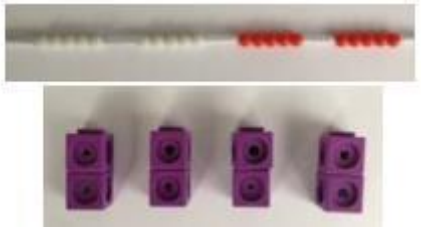
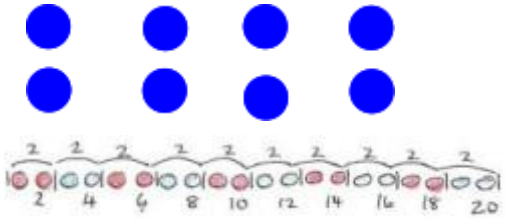
Early Years Foundation Stage

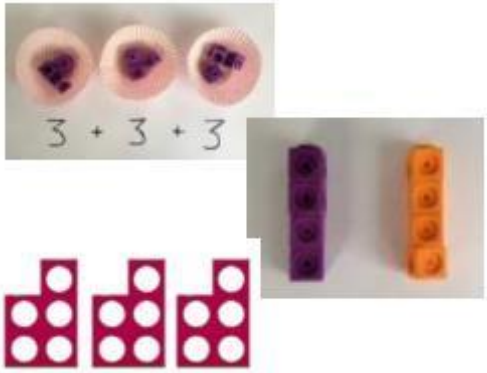
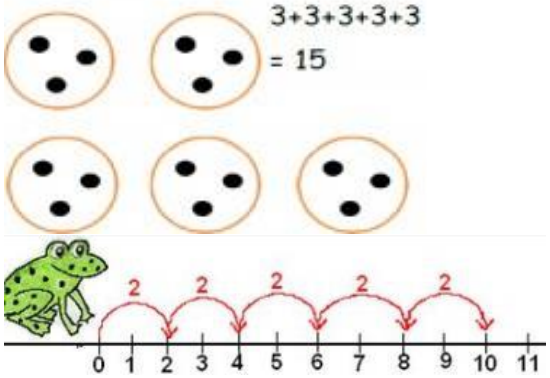
Key Vocabulary: odd, even, groups of, lots of, double, pattern

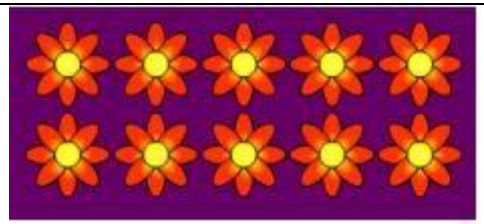
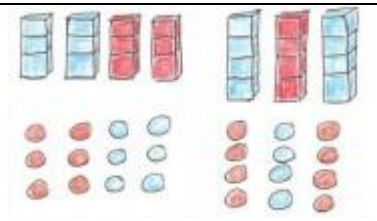
Learning Intentions	Concrete	Pictorial	Abstract
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally	Children will experience equal groups of objects and will count in groups. They will work on **practical problem solving activities** involving equal sets or groups.  How many socks do 4 children wear?  1 **,2** ,3 ,**4**, 5, **6,** 7 ,**8**	I give you each 4 strawberries how many Are there altogether? 1,2,3,**4**  5,6,7,**8**	

Year One

Key Vocabulary: odd, even, double, near double, multiple, pattern, times, multiplied, groups of, lots of

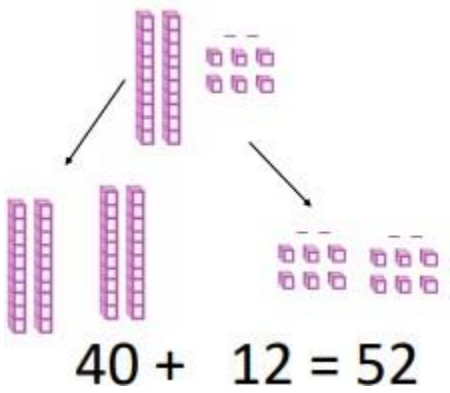
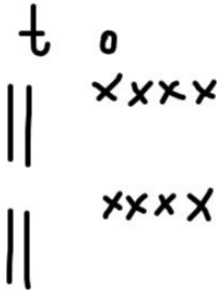
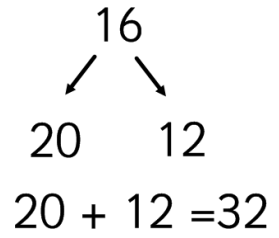
Learning Intentions	Concrete	Pictorial	Abstract
Doubling (up to double 10)	Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling 	Draw images to double numbers  4 + 4 = 8  3+ 3 = 6	4 + 4 = 8 5 + 5 = 10 12 = 6 + 6 3 + ? = 6
Counting in multiples	Count the groups as children are skip counting, children may use their fingers as they are skip counting. 	Children make representations to show counting in multiples. 	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30

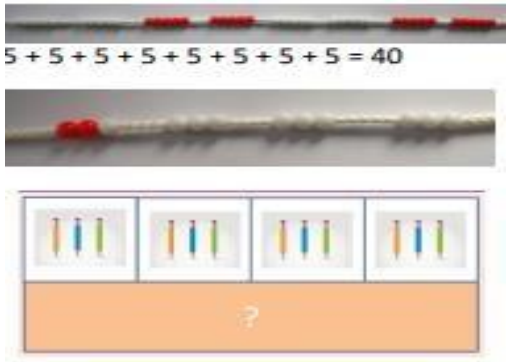
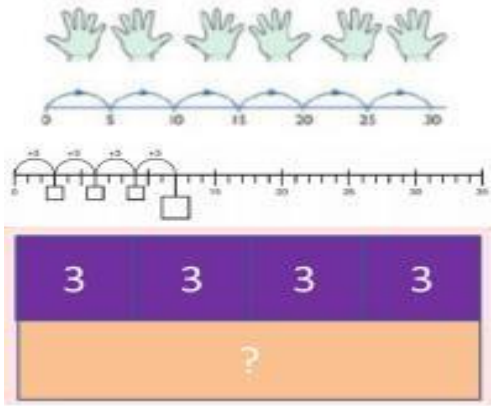
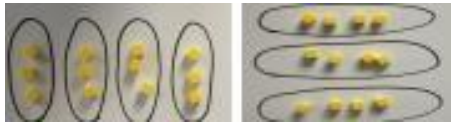
			
Repeated addition	Use different objects to add equal groups 	There are 3 sweets in one bag. How many sweets are in 5 bags altogether? 	Write addition sentences to describe objects and pictures. 
Understanding Arrays	Use objects laid out in arrays to find the answers to 2 lots of 5, 3 lots of 2 etc.	Draw representations of arrays to show understanding.	3 lots of 2 = 6 5 times 2 = 10

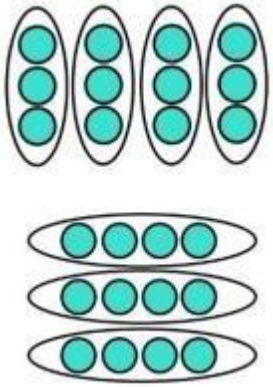
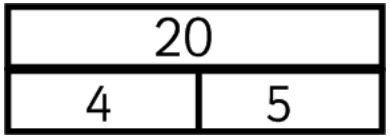
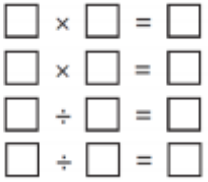
			

Year Two

Key Vocabulary: odd, even, double, near double, multiple, pattern, times, multiplied, groups of, lots of

Learning Intentions	**Concrete**	**Pictorial**	**Abstract**
Doubling	Doubling using place value using Dienes 	Double 24 = 48 	Partition a number and then double each part before recombining it back together. 
Counting in multiples 0f 2s, 3s, 5s, 10s (forwards and backwards)	Count the groups as children are skip counting, children may use their fingers as they are skip counting. Use bar models.	Number lines, counting sticks and bar models should be used to show representation of counting in multiples.	Count in multiples of a number aloud. Write sequences with multiples of numbers. 0, 2, 4, 6, 8, 10

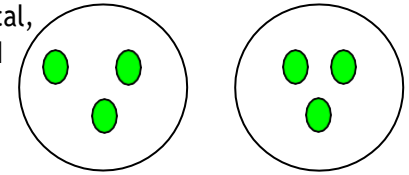
			0, 3, 6, 9, 12, 15 0, 5, 10, 15, 20, 25 , 30
Multiplication is commutative	Create arrays using counters and cubes and Numicon  Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer 	Use representations of arrays to show different calculations and explore commutativity.  3 x 5 = 15 (3 5 times)  5 x 3= 15 (5 3 times)	12 = 3 x 4 12 = 4 x 3 Use an array to write multiplication sentences and reinforce repeated addition.  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15

Using the Inverse This should be taught alongside division, so pupils learn how they work alongside each other.		 3 x 4 = 12 4 x 3 =12 12 ÷4 = 3 12 ÷ 3 = 4	 

Division

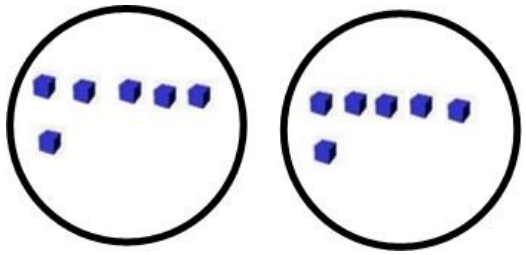
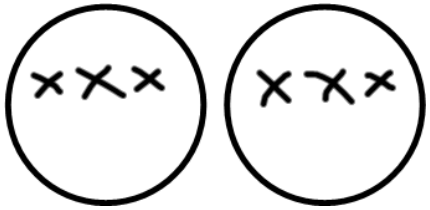
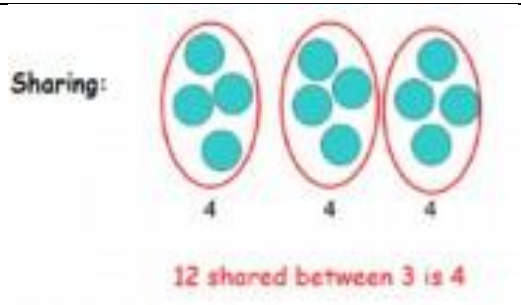
Early Years Foundation Stage

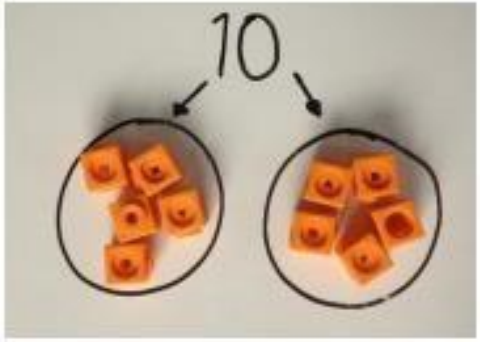
Key Vocabulary: half, smallest, less, equal groups, share, equally

Learning Intentions	Concrete	Pictorial	Abstract
Count back in 1s from any given number Begin to count back using number rhymes Explore and represent patterns within numbers up to 10, including how quantities can be distributed equally	In division children will be introduced as both sharing and grouping using a variety of resources. Children will understand equal groups and share items out in play and problem solving. The focus at this stage will be practical, with the teacher demonstrating, and using the correct vocabulary. Children solve grouping problems 	 If I have 6 buttons and I share them between 2 people, how many will each person get? 'Get yourselves into groups of___'.	

Year One

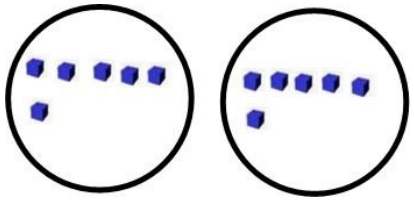
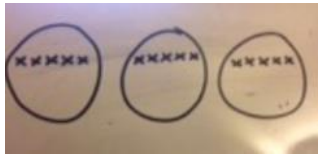
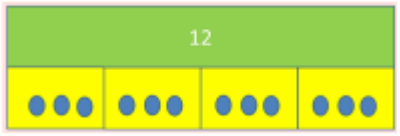
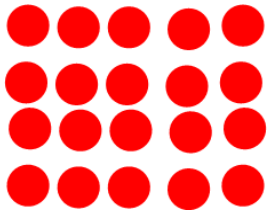
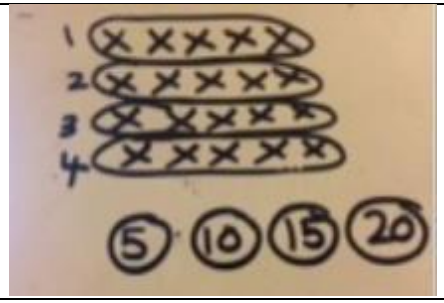
Key Vocabulary: half, halves, smallest, less, equal groups, share, equally, divide, division, group, half

Learning Intentions	Concrete	Pictorial	Abstract
Halving	Children use practical apparatus to share equally 	Use a picture to share in two sets equally  Half of 6 = 3	Half of 4 = 8 ½ of 4 = 8 I know that double 4 balances 8 so half of 8 is 4.
Division as sharing	I have 10 cubes, can you share them equally in 2 groups?		12 shared between 4 groups is 3 If I share 6 sweets equally between 2 friends, they will have 3 each.

Year Two

Key Vocabulary: half, halves, smallest, less, equal groups, share, equally, divide, division, group, half

Learning	Concrete	Pictorial	Abstract
Intentions			
Division as sharing	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding. 	 Children use bar modelling to show and support understanding.  12 ÷ 4 = 3	Use inverse I know that 3 x 4 = 12 so 12 ÷ 3 = 4
Division as grouping	I have 20 pencils. 5 go in each pot. How many pots will I need? 		Use inverse I know that 5 x 4 = 20 so there will be 4 pots.