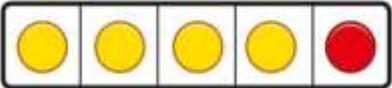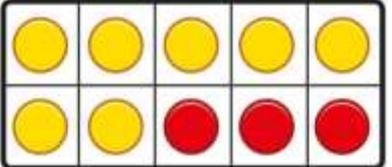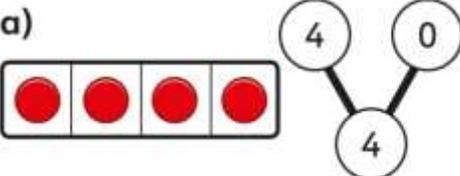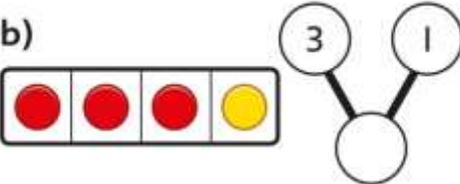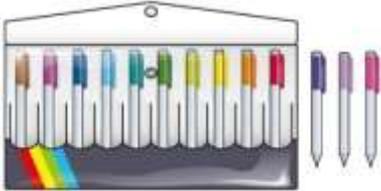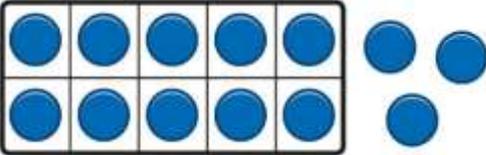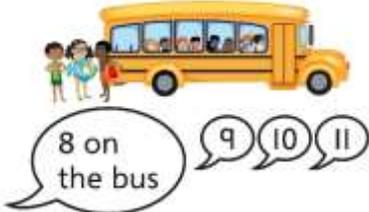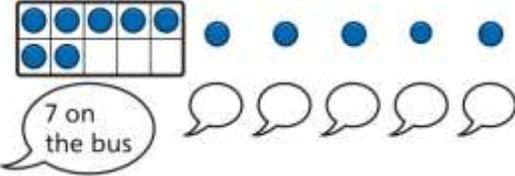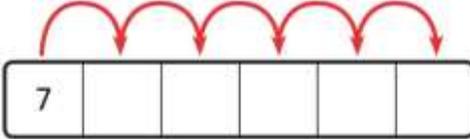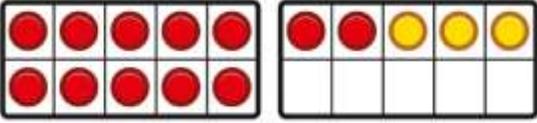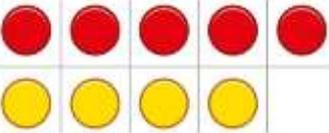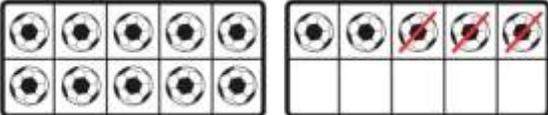| KEY STAGE 1		
Children develop the core ideas that underpin all calculation. They begin by connecting calculation with counting on and counting back, but they should learn that understanding wholes and parts will enable them to calculate efficiently and accurately, and with greater flexibility. They learn how to use an understanding of 10s and 1s to develop their calculation strategies, especially in addition and subtraction.		
Key language: whole, part, ones, ten, tens, number bond, add, addition, plus, total, altogether, subtract, subtraction, find the difference, take away, minus, less, more, group, share, equal, equals, is equal to, groups, equal groups, times, multiply, multiplied by, divide, share, shared equally, times-table		
	Concrete	**Pictorial**	**Abstract**
Year 1 Addition			
	Counting and adding more Children add one more person or object to a group to find one more.	**Counting and adding more** Children add one more cube or counter to a group to represent one more. *One more than 4 is 5.*	**Counting and adding more** Use a number line to understand how to link counting on with finding one more. *One more than 6 is 7.* *7 is one more than 6.* Learn to link counting on with adding more than one. *5 + 3 = 8*
	Understanding part-part-whole relationship Sort people and objects into parts and understand the relationship with the whole.	**Understanding part-part-whole relationship** Children draw to represent the parts and understand the relationship with the whole.	**Understanding part-part-whole relationship** Use a part-whole model to represent the numbers.
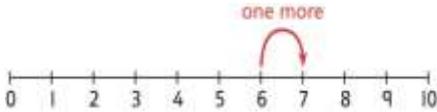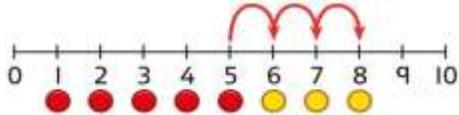
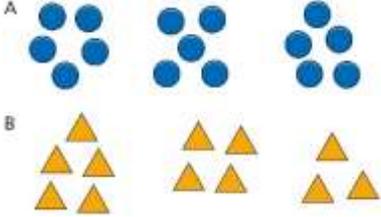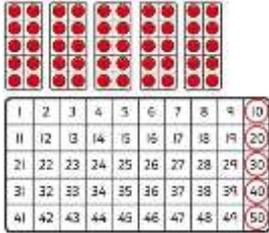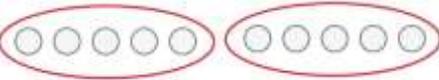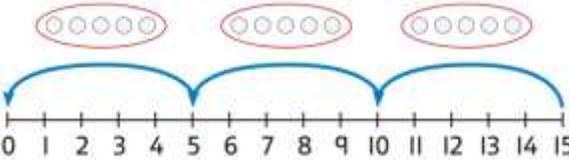|		
The parts are 2 and 4. The whole is 6.	*The parts are 1 and 5. The whole is 6.*	$6 + 4 = 10$
Knowing and finding number bonds within 10 Break apart a group and put back together to find and form number bonds. $3 + 4 = 7$ $6 = 2 + 4$	**Knowing and finding number bonds within 10** Use five and ten frames to represent key number bonds. $5 = 4 + 1$ $10 = 7 + 3$	**Knowing and finding number bonds within 10** Use a part-whole model alongside other representations to find number bonds. Make sure to include examples where one of the parts is zero. a) b) $4 + 0 = 4$ $3 + 1 = 4$
Understanding teen numbers as a complete 10 and some more Complete a group of 10 objects and count	**Understanding teen numbers as a complete 10 and some more** Use a ten frame to support understanding of	**Understanding teen numbers as a complete 10 and some more**.
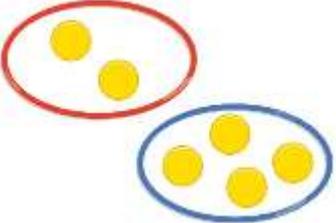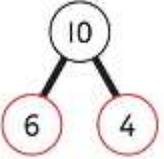
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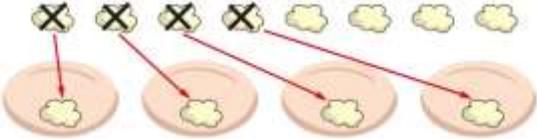|		
more. *13 is 10 and 3 more.*	a complete 10 for teen numbers. *13 is 10 and 3 more.*	*1 ten and 3 ones equal 13.* *10 + 3 = 13*
Adding by counting on Children use knowledge of counting to 20 to find a total by counting on using people or objects.	**Adding by counting on** Children use counters to support and represent their counting on strategy.	**Adding by counting on** Children use number lines or number tracks to support their counting on strategy. *7 + 5 =*
Adding the 1s Children use bead strings to recognise how to add the 1s to find the total efficiently. *2 + 3 = 5* *12 + 3 = 15*	**Adding the 1s** Children represent calculations using ten frames to add a teen and 1s. *2 + 3 = 5* *12 + 3 = 15*	**Adding the 1s** Children recognise that a teen is made from a 10 and some 1s and use their knowledge of addition within 10 to work efficiently. *3 + 5 = 8* *So, 13 + 5 = 18*
Year 1 Subtraction		
Counting back and taking away Children arrange objects and remove to find how many are left.	**Counting back and taking away** Children draw and cross out or use counters to represent objects from a	**Counting back and taking away** Children count back to take away and use a number line or number track to support the

1 less than 6 is 5.
6 subtract 1 is 5.

problem.

$9 - \square = \square$

There are $\square$ children left.

method.

8...7...6

$9 - 3 = 6$

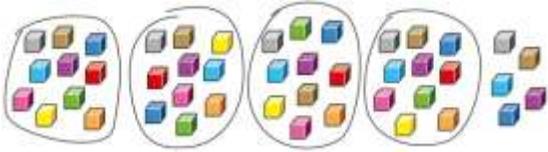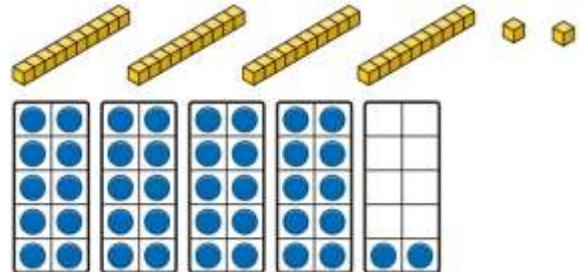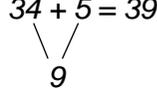| **Finding the difference** Arrange two groups so that the difference between the groups can be worked out. *8 is 2 more than 6.* *6 is 2 less than 8.* *The difference between 8 and 6 is 2.*	**Finding the difference** Represent objects using sketches or counters to support finding the difference. *5 − 4 = 1* *The difference between 5 and 4 is 1.*	
Subtraction within 20 Understand when and how to subtract 1s efficiently. Use a bead string to subtract 1s efficiently. *5 − 3 = 2* *15 − 3 = 12*	**Subtraction within 20** Understand when and how to subtract 1s efficiently. *5 − 3 = 2* *15 − 3 = 12*	
Year 1 Multiplication		

Recognising and making equal groups Children arrange objects in equal and unequal groups and understand how to recognise whether they are equal. 	**Recognising and making equal groups** Children draw and represent equal and unequal groups. 	**Describe equal groups using words** *Three equal groups of 4.* *Four equal groups of 3.*
Finding the total of equal groups by counting in 2s, 5s and 10s There are 5 pens in each pack … 5…10…15…20…25…30…35…40…	**Finding the total of equal groups by counting in 2s, 5s and 10s** 100 squares and ten frames support counting in 2s, 5s and 10s. 	
Year 1 Division		
Grouping Learn to make equal groups from a whole and find how many equal groups of a certain size can be made. Sort a whole set people and objects into equal groups. 	**Grouping** Represent a whole and work out how many equal groups. *There are 10 in total.* *There are 5 in each group.* *There are 2 groups.*	**Grouping** Children may relate this to counting back in steps of 2, 5 or 10.

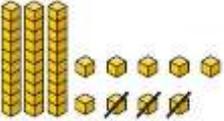|		
	There are 10 children altogether. *There are 2 in each group.* *There are 5 groups.*		
	Sharing Share a set of objects into equal parts and work out how many are in each part**.**	**Sharing** Sketch or draw to represent sharing into equal parts. This may be related to fractions.	**Sharing** *10 shared into 2 equal groups gives 5 in each group.*

	Year 2		
	Concrete	**Pictorial**	**Abstract**
Year 2 Addition			
Understanding 10s and 1s	Group objects into 10s and 1s. Bundle straws to understand unitising of 10s.	Understand 10s and 1s equipment, and link with visual representations on ten frames.	Represent numbers on a place value grid, using equipment or numerals.
Adding a 1-digit number to a 2-digit number not bridging a 10	Add the 1s to find the total. Use known bonds within 10. This can also be done in a place value grid.	Add the 1s. 34 is 3 tens and 4 ones. 4 ones and 5 ones are 9 ones. The total is 3 tens and 9 ones.	$34 + 5 = 39$ 9 Children add the ones using number bonds.
Adding a multiple of 10 to a 2-digit number	Add the 10s and then recombine.	Add the 10s and then recombine.	Add the 10s and then recombine. $37 + 20 = ?$ $30 + 20 = 50$

	27 is 2 tens and 7 ones. *50 is 5 tens.* *There are 7 tens in total and 7 ones.* *So, 27 + 50 is 7 tens and 7 ones.*	*66 is 6 tens and 6 ones.* *66 + 10 = 76* A 100 square can support this understanding.	*50 + 7 = 57* *37 + 20 = 57*
Adding two 2-digit numbers	*Use practical resources to represent the number sentences e.g. dienes and numicon* *35 + 23 = 58*	Add the 10s and 1s separately. *5 + 3 = 8* *There are 8 ones in total.* *3 + 2 = 5* *There are 5 tens in total.*	Add the 10s and then the ones and recombine *37 + 22 = ?* *30 + 20 = 50* *7 + 2 = 9* *50 + 9 = 59*
Year 2 Subtraction			
Subtracting multiples of 10	Use known number bonds and unitising to subtract multiples of 10.	Use known number bonds and unitising to subtract multiples of 10.	Use known number bonds and unitising to subtract multiples of 10.

	  8 subtract 6 is 2. *So, 8 tens subtract 6 tens is 2 tens.*	 *10 − 3 = 7* *So, 10 tens subtract 3 tens is 7 tens.*	 *7 tens subtract 5 tens is 2 tens.* *70 − 50 = 20*
Subtracting a single-digit number	Subtract the 1s. This may be done in or out of a place value grid. 	Subtract the 1s. This may be done in or out of a place value grid. 	Subtract the 1s. Understand the link between counting back and subtracting the 1s using known bonds.
Subtracting a single-digit number using exchange	Exchange 1 ten for 10 ones. This may be done practically using the dienes.	Exchange 1 ten for 10 ones. 	Exchange 1 ten for 10 ones. *25 − 7 = 18*
Subtracting a 2-digit number	Subtract by taking away.	Subtract the 10s and the 1s. This can be represented on a 100 square.	Subtract the 10s and the 1s. This can be represented on a number line.
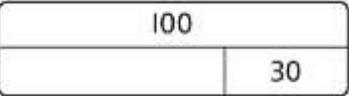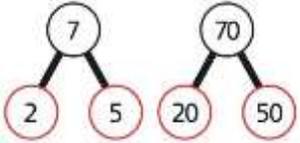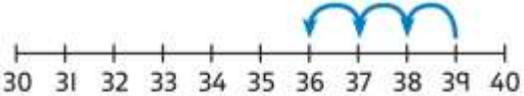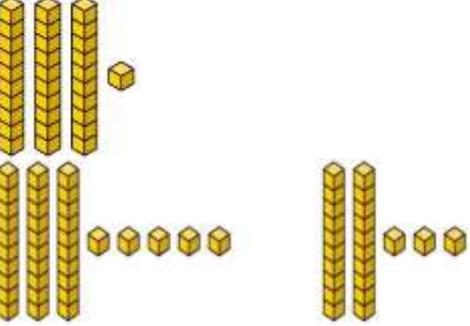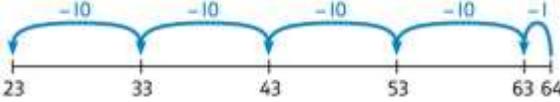
	61 − 18 *I took away 1 ten and 8 ones.*		*64 − 41 = ?* *64 − 1 = 63* *63 − 40 = 23* *64 − 41 = 23* *46 − 20 = 26* *26 − 5 = 21* *46 − 25 = 21*
Subtracting a 2-digit number using place value and columns	Subtract the 1s. Then subtract the 10s. This may be done in or out of a place value grid. *38 − 16 = 22*	Subtract the 1s. Then subtract the 10s.	Using column subtraction, subtract the 1s. Then subtract the 10s.
Subtracting a 2-digit number with exchange		Exchange 1 ten for 10 ones. Then subtract the 1s. Then subtract the 10s.	Using column subtraction, exchange 1 ten for 10 ones. Then subtract the 1s. Then subtract the 10s.

Year 2 Multiplication			
Equal groups and repeated addition	Recognise equal groups and write as repeated addition and as multiplication. *3 groups of 5 chairs* *15 chairs altogether*	Recognise equal groups using standard objects such as counters and write as repeated addition and multiplication. *3 groups of 5* *15 in total*	Use a number line and write as repeated addition and as multiplication. *5 + 5 + 5 = 15* *3 × 5 = 15*
Using arrays to represent multiplication and support understanding	Understand the relationship between arrays, multiplication and repeated addition.	Understand the relationship between arrays, multiplication and repeated addition.	Understand the relationship between arrays, multiplication and repeated addition.

4 groups of 5

4 groups of 5 … 5 groups of 5
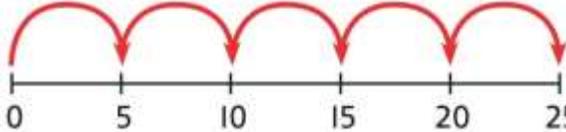
5 x 5 = 25

Understanding commutativity	Use arrays to visualise commutativity. *I can see 6 groups of 3.* *I can see 3 groups of 6.*	Form arrays using counters to visualise commutativity. Rotate the array to show that orientation does not change the multiplication. *This is 2 groups of 6 and also 6 groups of 2.*	Use arrays to visualise commutativity. *4 + 4 + 4 + 4 + 4 = 20* *5 + 5 + 5 + 5 = 20* *4 x 5 = 20 and 5 x 4 = 20*
Year 2 Division			
Sharing equally	Start with a whole and share into equal parts, one at a time. *12 shared equally between 2.* *They get 6 each.*	Represent the objects shared into equal parts using a bar model. *20 shared into 5 equal parts.* *There are 4 in each part.*	Use a bar model to support understanding of the division. *18 ÷ 2 = 9*
Grouping equally	Understand how to make equal groups from a whole.	Understand the relationship between grouping and the division statements.	Understand how to relate division by grouping to repeated subtraction.
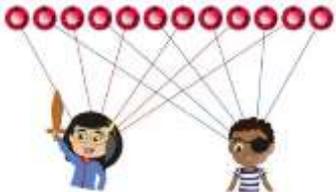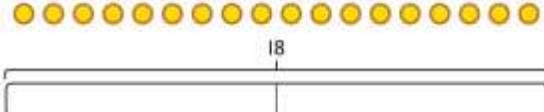
8 divided into 4 equal groups.
There are 2 in each group.

$12 \div 3 = 4$

$12 \div 4 = 3$

$12 \div 6 = 2$

$12 \div 2 = 6$
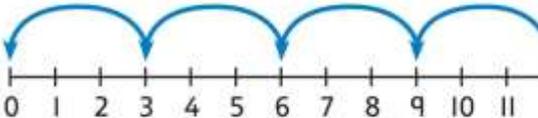
There are 4 groups now.

12 divided into groups of 3.
$12 \div 3 = 4$

There are 4 groups.
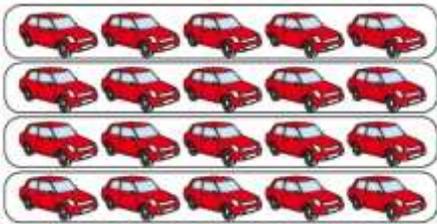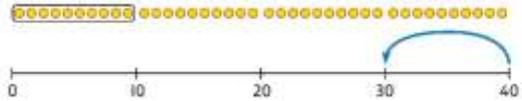
Using known times-tables to solve divisions	Understand the relationship between multiplication facts and division.	Link equal grouping with repeated subtraction and known times-table facts to support division.	Relate times-table knowledge directly to division.
	4 groups of 5 cars is 20 cars in total. *20 divided by 4 is 5.*	*40 divided by 4 is 10.* Use a bar model to support understanding of the link between times-table knowledge and division.	$1 \times 10 = 10$ $2 \times 10 = 20$ $3 \times 10 = 30$ $4 \times 10 = 40$ $5 \times 10 = 50$ $6 \times 10 = 60$ $7 \times 10 = 70$ $8 \times 10 = 80$ *I used the 10 times-table to help me. $3 \times 10 = 30$.* *I know that 3 groups of 10 makes 30, so I know that 30 divided by 10 is 3.* *$3 \times 10 = 30$ so $30 \div 10 = 3$*