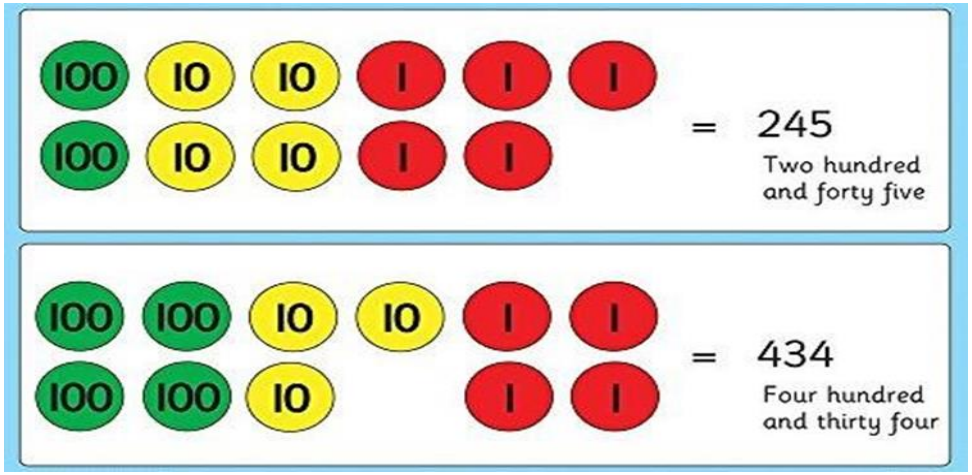
Calculation Policy

Year 1 and Year 2

www.teaguesbridgeprimary.org

Maths Calculation Policy
Year 1 and Year 2

The following pages show our school's progression in calculation (addition, subtraction, multiplication and division) and how this works in line with the National Curriculum. The consistent use of the concrete, pictorial and abstract approach throughout our school helps children develop mastery across all the operations in an efficient and reliable way. This policy shows how these methods develop children's confidence in their understanding of both written and mental methods.



Mathematics Intent

At Teagues Bridge, our intention is **ambitious.** We aim to create strong mathematicians who have the necessary skills and understanding to tackle mathematical challenges in varying contexts, including the ability to reason and apply their knowledge to solving problems. This should mean that children are able to apply their knowledge to everyday life and can **aspire** to achieve anything that they want. We want our pupils to have strong mental manipulation and to use written strategies when appropriate.

Our philosophy for mathematics is replacing an idea that maths is lots of rules and numbers with a study of patterns and connected ideas. In early years they will build a foundation of number understanding and representation through mainly concrete and pictorial representations. The approach will be supported by in depth questioning, throughout the school to develop mastery.

Use of CPA is encouraged to ensure the curriculum is accessible for all children and that they all have the **opportunity** and are able to demonstrate their understanding in a variety of ways. This will enable them to have a good understanding of maths and not just the ability to follow a procedure. We want to **empower** them to want to ask questions and want to find the answers.

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

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through

being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Our lessons are structured to enable all children to achieve and have an **opportunity** to make progress with their learning. Each lesson begins with a **CLIC maths** activity, where they have chance to develop their mental strategies, secure number facts and number manipulation. They then **develop** their mathematical fluency with the teacher modelling and explaining before they have a go themselves. Children then have a **reasoning/ problem solving** activity which is a variation of the previous work to demonstrate they have mastered the objective. Children who are ready can then **challenge** themselves with a task that requires applying the learning to a greater depth. We have our own programme of study which is supported with schemes like White Rose to support.

	Year 1	Known facts	Essential Knowledge	Year 2	Known facts	Essential Knowledge
Addition	Read, write, and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs.	Represent and use number bonds and related subtraction facts within 20. Add and subtract 1 digit and 2 digit numbers to 20, including zero	1 more. Largest number first. Add 10. Ten plus ones. Doubles up to 10. Number bonds 5 and 6. Number bonds 7 and 8. Number bonds 9 and 10. Use number bonds of 10 to derive bonds of 11.	Recording addition in columns supports place value and prepares for formal written methods with larger numbers.	Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100.	10 more. Add 1 digit to 2 digit by bridging. Partition second number and add tens and then ones. Add 10 and multiples of 10. Doubles up to 20 and multiples of 5. Add near multiples of 10. Number bonds 20, 12 and 13. Number bonds 14 and 15. Number bonds 16 and 17. Number bonds 18 and 19 Partition and recombine.
Subtraction	Read, write, and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs.	Represent and use number bonds and related subtraction facts within 20.	1 less, Count back, Subtract 10, Teens subtract 10, number bonds: subtraction 5 and 6, subtraction 7	Recording subtraction in columns supports place value and prepares for formal written methods with larger numbers.	Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100.	10 less, subtract 1 digit from 2 digit by bridging, partition second number and countback in tens and

		Add and subtract 1 digit and 2 digit numbers to 20, including zer0	and 8, subtraction 9 and 10, difference between.			ones, subtract 10 and multiples of 10, subtract near multiples of 10, add near doubles of 10, Number bonds: subtraction 20, 12 and 13, 14 and 15, 16 and 17, 18 and 19, difference between.
Multiplication	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.	Count in multiples of twos, fives and tens.	Count in 2's Count in 5's Count in 10's Doubles up to 10 Double multiples of 10 Count in 2s, 5s and 10s.	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs.	Recall and use X and ÷ facts for the 2, 5 and 10 X tables, including recognising odd and even numbers.	2x table 5x table 10x table Doubles up to 20 Doubles of multiples of 5. Count in 3s.
Division	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.	Count in multiples of twos, fives and tens.	Count back in 2s Count back in 5s Count back in 10s Halves up to 10. Halve multiples of 10 How many 2s? 5s? 10s? ***Test of divisibility*** - All even numbers will divide by 2	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs.	Recall and use X and ÷ facts for the 2, 5 and 10X tables, including recognising odd and even numbers.	Division facts (2x table) Division facts (10x table) Division facts (5x table) Halves up to 20 Review division facts (2 x 5 x 10 x tables) Count back in 3s **Test all divisibility** - all numbers ending in 0 will divide by 10. All numbers ending in 5 and 0 will divide by 5.

Vocabulary	Year 1	Year 2
Addition	**Subject specific:** **put together, add, addition, altogether, double, total, more than, equals, plus, make, double, near double, one more, two more.. ten more... one hundred more, how many more to make...? HOow many more is...than...? How much more is...?** **Instructional vocabulary:** start from, start with, start at look at point, to show me, show how you... show your working	**Subject specific:** put together, add, addition, altogether, increase, sum, double, total, more than, equals, plus, make, **commutative, inverse, sum, partition, near double, how many more to make...?** **Instructional vocabulary:** Calculate, tell me, describe, name, pick out, discuss, talk about, explain, explain your method, explain how you got your answer, give an example of... show how you...
Subtraction	**Subject specific:** **Subtract, takeaway, distance between, difference between, less than, minus, leave, fewer, left over, equals, How many more? How much greater?** **How much more is...? How many are left over? How many have gone? One less, two less, ten less, How many fewer is... than...? Difference between, half, halve.** **Instructional vocabulary:** start from, start with, start at look at point, to show me	**Subject specific:** Subtract, subtraction, how many are left over? takeaway, distance between, difference between, less than, minus, leave, fewer, left over, equals, **tens boundary, partition, rearrange, inverse,** one less, ten less, one hundred less, how many fewer is..than..? how much less is...? Difference between, half, halve. Difference, partition, rearrange, inverse, place value. **Instructional vocabulary:** tell me, describe, name, pick out, discuss, talk about, explain, explain your method, explain how you got your answer, give an example of... show how you... , solve, investigate.
Multiplication	**Subject specific:** **double, equal groups, array, lots of, count in ones, twos, tens.. groups of.** **Instructional vocabulary:** carry on, continue repeat what comes next? find, choose, collect. use, make, build. tell me, describe, pick out, talk about, explain, show me, read, write, record	**Subject specific:** double, equal groups, array, lots of, **odd, even, commutative, repeated addition, inverse, groups of, multiply, multiplied by, multiple of, twice, row, column, halve, share, repeated addition, share equally. array row, column double.** **Instructional vocabulary:** carry on, continue, repeat, what comes next? predict describe the pattern describe the rule. find, find all, find different, investigate Give an example of... Show how you...

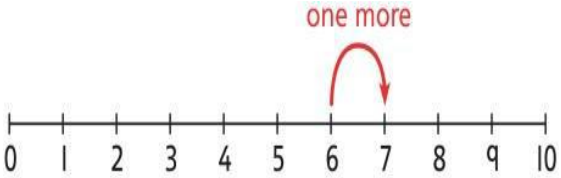
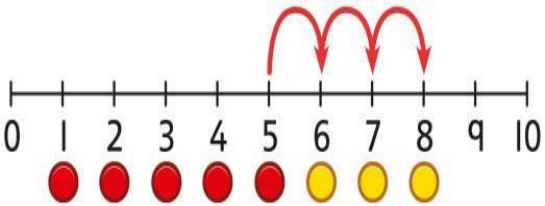
Division	**Subject specific:** **share, equal groups, array, groups of, odd, even** **Instructional vocabulary:** count out, share out, left, left over	**Subject specific:** share, equal groups, array **pairs, divide, divided by, divided into, left over, odd, even, repeated addition, inverse.** **Instructional vocabulary:** tell me, describe, name, pick out, discuss, talk about, explain, explain your method. Explain how you got your answer, give an example of. show how you. . .

KEYSTAGE 1

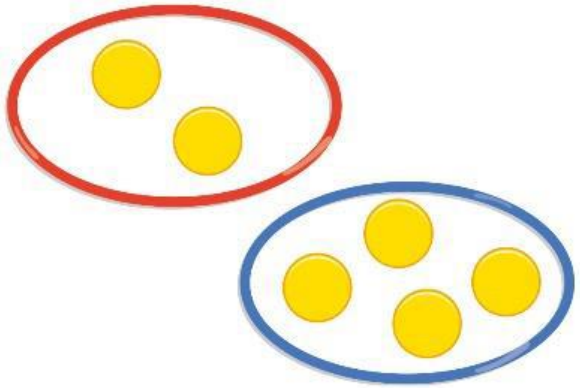
Children develop the core ideas that underpin all calculation. They begin by connecting calculation with counting on and counting back, but they should learn that understanding wholes and parts will enable them to calculate efficiently and accurately, and with greater flexibility. They learn how to use an understanding of 10s and 1s to develop their calculation strategies, especially in addition and subtraction.

Addition and Subtraction	Multiplication and Division	Fractions
Children first learn to connect addition and subtraction with counting, but they soon develop two very important skills: an understanding of parts and wholes, and an understanding of unitising 10s, to develop efficient and effective calculation strategies based on known number bonds and an increasing awareness of place value. Addition and subtraction are taught in a way that is interlinked to highlight the link between the two operations.	Children develop an awareness of equal groups and link this with counting in equal steps, starting with 2s, 5s and 10s. In Year 2, they learn to connect the language of equal groups with the mathematical symbols for multiplication and division. They learn how multiplication and division can be related to repeated addition and repeated subtraction to find the answer to the calculation. In this key stage, it is vital that children explore and experience a variety of strong images and manipulative representations of equal groups,	In Year 1, children encounter halves and quarters, and link this with their understanding of sharing. They experience key spatial representations of these fractions, and learn to recognise examples and non-examples, based on their awareness of equal parts of a whole. In Year 2, they develop an awareness of unit fractions and experience non-unit fractions, and they learn to write them and read them in the common format of numerator and denominator.

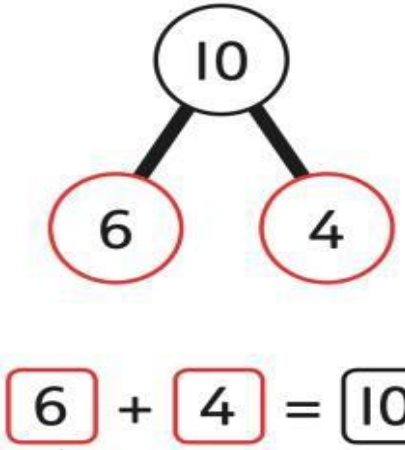
A key idea is that children will select methods and approaches based on their number sense. For example, in Year 1, when faced with 15 – 3 and 15 – 13, they will adapt their ways of approaching the calculation appropriately. The teaching should always emphasise the importance of mathematical thinking to ensure accuracy and flexibility of approach, and the importance of using known number facts to harness their recall of bonds within 20 to support both addition and subtraction methods. In Year 2, they will start to see calculations presented in a column format, although this is not expected to be formalised until KS2. We show the column method in Year 2 as an option; teachers may not wish to include it until Year 3.	including concrete experiences as well as abstract calculations. Children begin to recall some key multiplication facts, including doubles, and an understanding of the 2, 5 and 10 times-tables and how they are related to counting.	

YEAR 1			
	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 2 and 4. The whole is 6.



6 + 4 = 10

Knowing and finding number bonds within 10

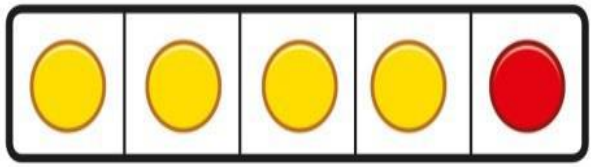
Break apart a group and put back together to find and form number bonds.

3 + 4 = 7

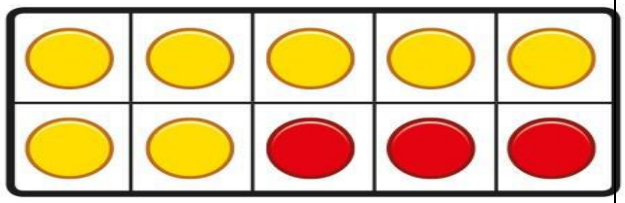
6 = 2 + 4

Knowing and finding number bonds within 10

Use five and ten frames to represent key number bonds.



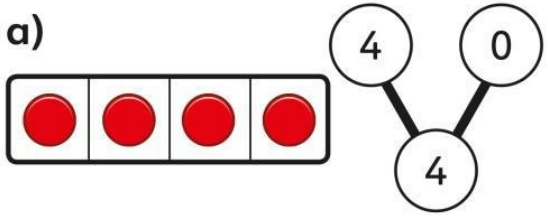
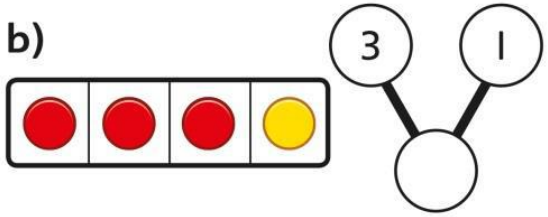
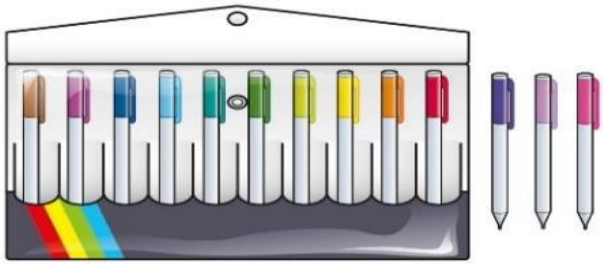
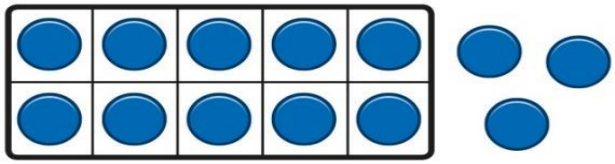
5 = 4 + 1

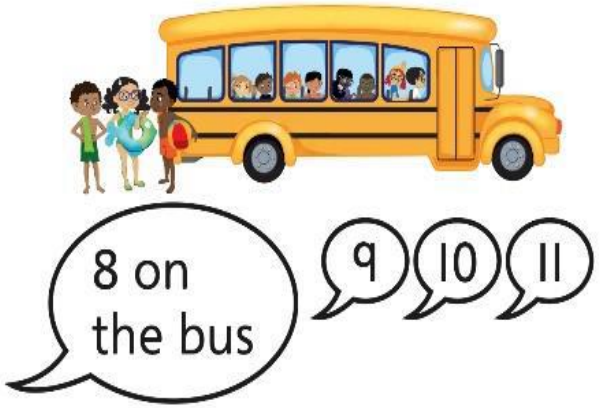
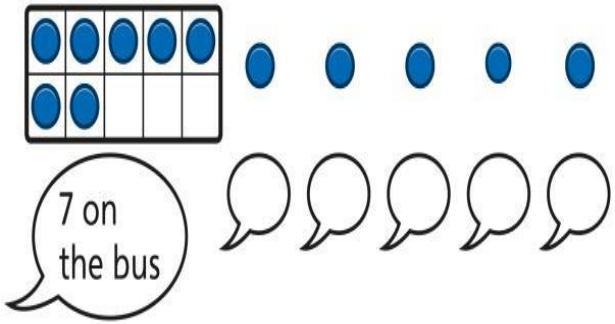
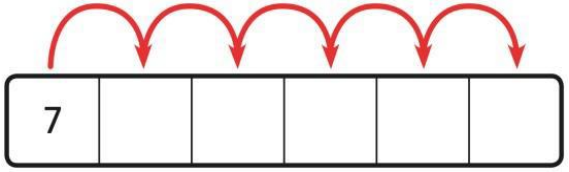
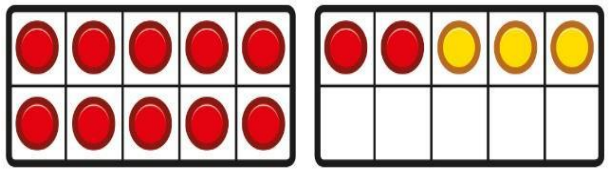


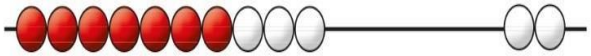
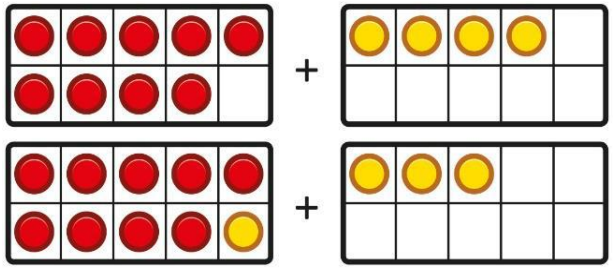
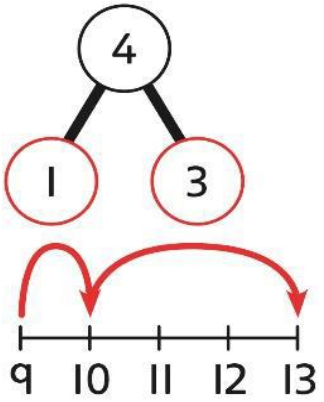
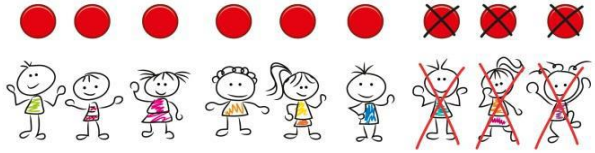
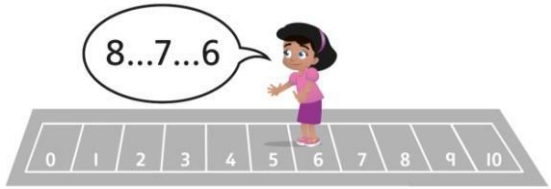
10 = 7 + 3

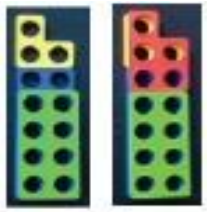
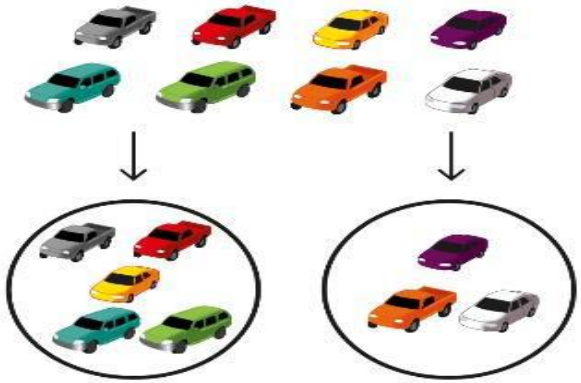
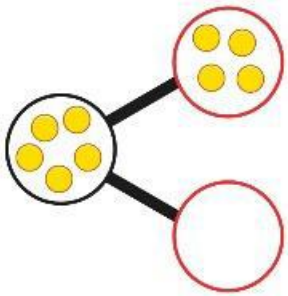
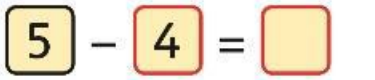
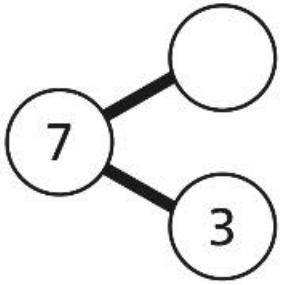
Knowing and finding number bonds within 10

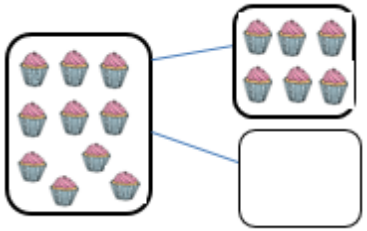
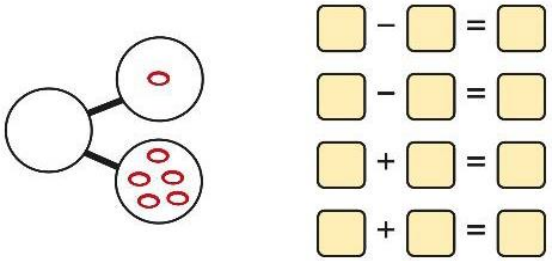
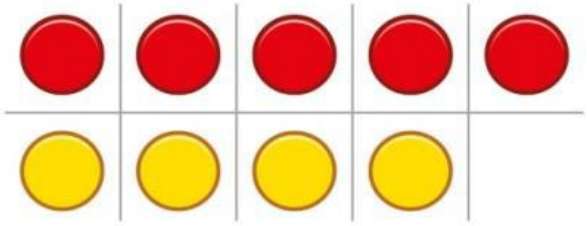
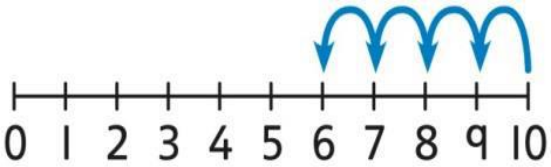
Use a part-whole model alongside other representations to find number bonds. Make sure to include examples where one of the parts is zero.

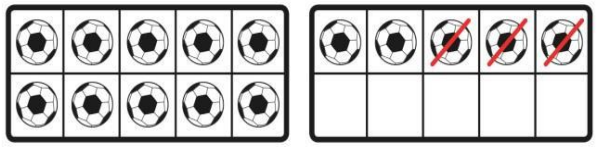
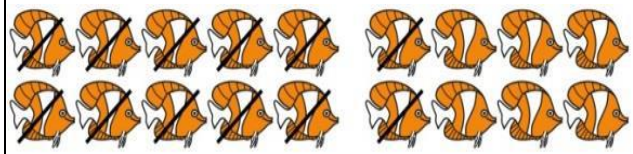
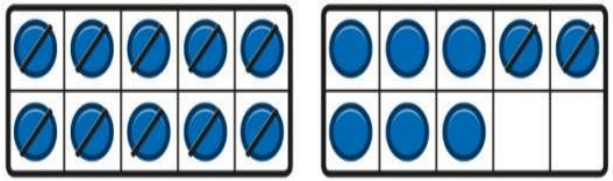
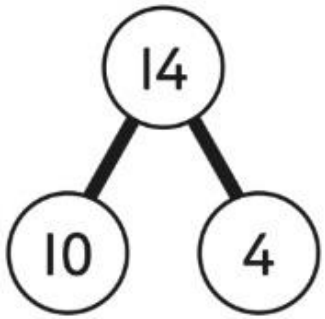
			a)  b)  *4 + 0 = 4* *3 + 1 = 4*
	Understanding teen numbers as a complete 10 and some more Complete a group of 10 objects and count more.  *13 is 10 and 3 more.*	**Understanding teen numbers as a complete 10 and some more** Use a ten frame to support understanding of a complete 10 for teen numbers.  *13 is 10 and 3 more.*	**Understanding teen numbers as a complete 10 and some more.** *1 ten and 3 ones equal 13.* *10 + 3 = 13*

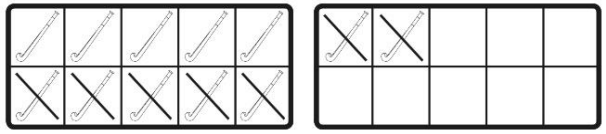
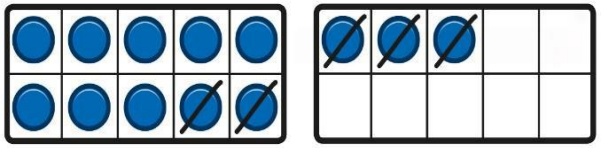
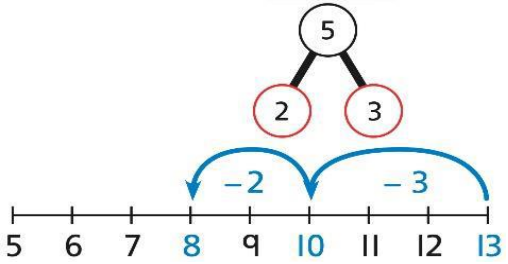
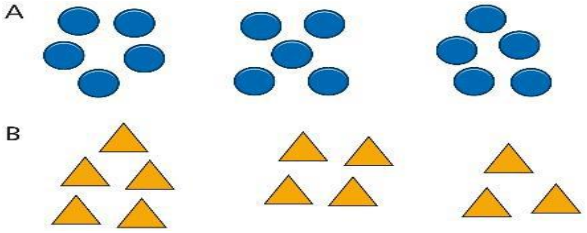
	Adding by counting on Children use knowledge of counting to 20 to find a total by counting on using people or objects. 	**Adding by counting on** Children use counters to support and represent their counting on strategy. 	**Adding by counting on** Children use number lines or number tracks to support their counting on strategy.  7 + 5 = ☐
	Adding the Is Children use bead strings to recognise how to add the Is to find the total efficiently.  *2 + 3 = 5* *12 + 3 = 15*	**Adding the Is** Children represent calculations using ten frames to add a teen and Is.  *2 + 3 = 5* *12 + 3 = 15*	**Adding the Is** Children recognise that a teen is made from a 10 and some Is and use their knowledge of addition within 10 to work efficiently. *3 + 5 = 8* *So, 13 + 5 = 18*
	Bridging the 10 using number bonds	**Bridging the 10 using number bonds**	**Bridging the 10 using number bonds**

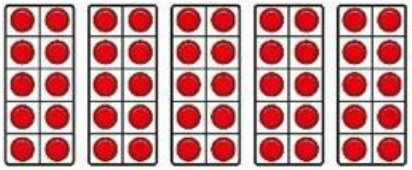
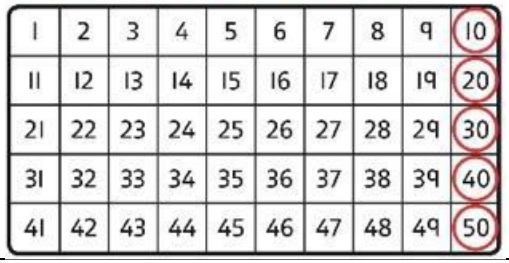
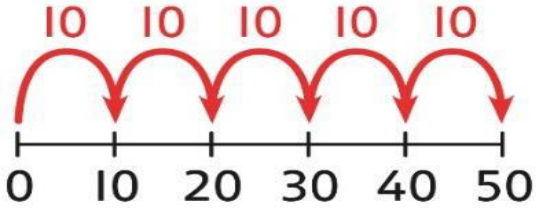
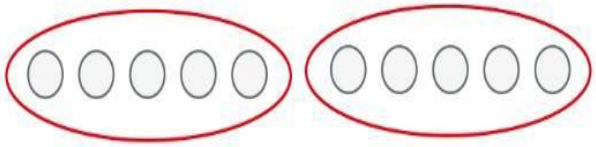
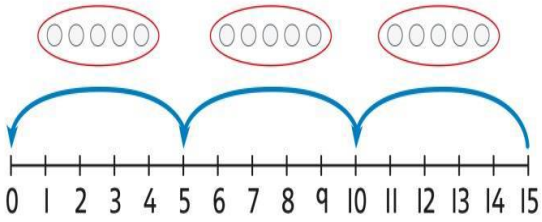
	Children use a bead string to complete a 10 and understand how this relates to the addition.  *7 add 3 makes 10.* *So, 7 add 5 is 10 and 2 more.*	Children use counters to complete a ten frame and understand how they can add using knowledge of number bonds to 10. 	Use a part-whole model and a number line to support the calculation.  9+4 = 13
Year 1 Subtraction	**Counting back and taking away** Children arrange objects and remove to find how many are left.  *1 less than 6 is 5.* *6 subtract 1 is 5.*	**Counting back and taking away** Children draw and cross out or use counters to represent objects from a problem.  9 – ☐ = ☐ There are ☐ children left.	**Counting back and taking away** Children count back to take away and use a number line or number track to support the method.  *9 – 3 = 6*  *15 – 6 = 9*

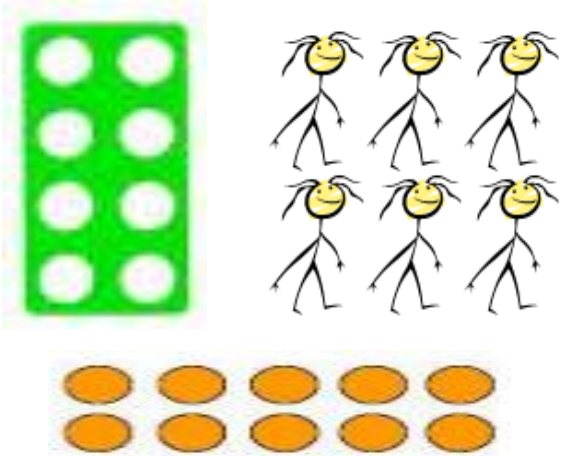
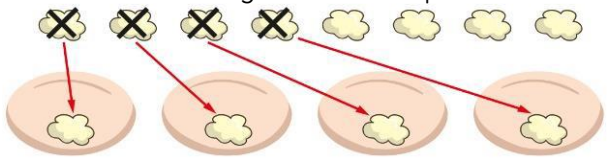
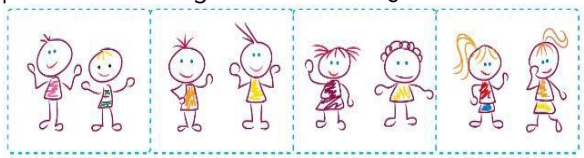
		 13-8 = 5	
	Finding a missing part, given a whole and a part Children separate a whole into parts and understand how one part can be found by subtraction.  *8 – 5 = ?*	**Finding a missing part, given a whole and a part** Children represent a whole and a part and understand how to find the missing part by subtraction.    10 – 6 = 4	**Finding a missing part, given a whole and a part** Children use a part-whole model to support the subtraction to find a missing part.  *7 – 3 = ?* Children develop an understanding of the relationship between addition and subtraction facts in a part-whole model.

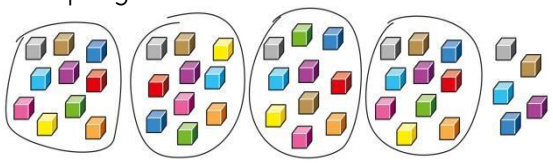
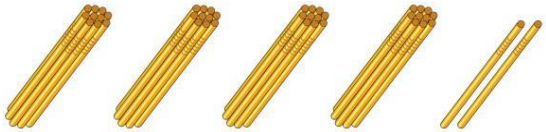
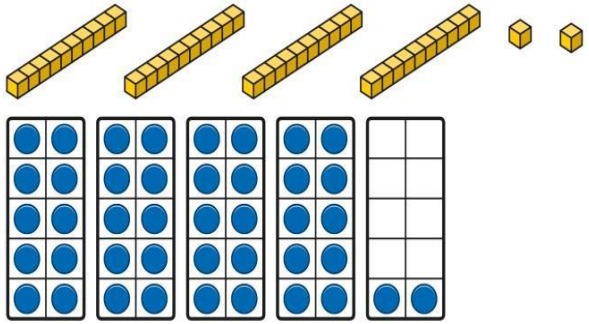
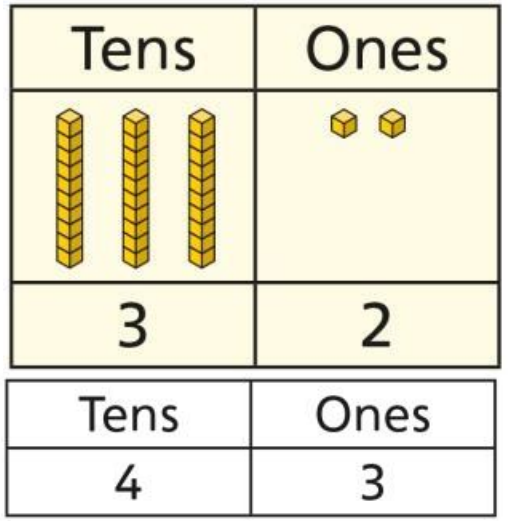
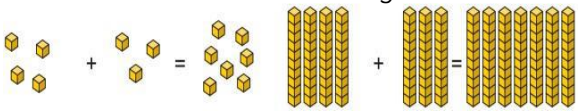
			
	Finding the difference Arrange two groups so that the difference between the groups can be worked out.  *8 is 2 more than 6.* *6 is 2 less than 8.* *The difference between 8 and 6 is 2.*	**Finding the difference** Represent objects using sketches or counters to support finding the difference. 	**Finding the difference** Children understand 'find the difference' as subtraction.  *10 – 4 = 6*

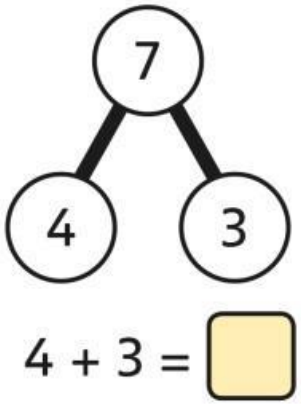
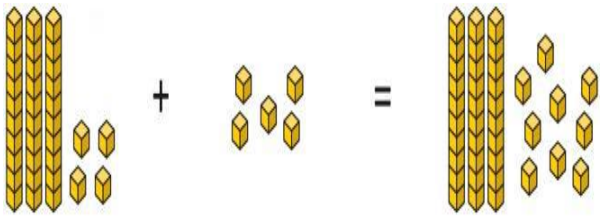
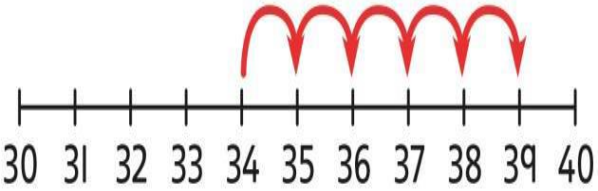
		5 – 4 = 1 *The difference between 5 and 4 is 1.*	*The difference between 10 and 6 is 4.*
	Subtraction within 20 Understand when and how to subtract 1s efficiently. Use a bead string to subtract 1s efficiently.  5 – 3 = 2 *15 – 3 = 12*	**Subtraction within 20** Understand when and how to subtract 1s efficiently.  *5 – 3 = 2* *15 – 3 = 12*	**Subtraction within 20** Understand how to use knowledge of bonds within 10 to subtract efficiently. *5 – 3 = 2* *15 – 3 = 12*
	Subtracting 10s and 1s For example: 18 – 12 Subtract 12 by first subtracting the 10, then the remaining 2.  *First subtract the 10, then take away 2.*	**Subtracting 10s and 1s** For example: 18 – 12 Use ten frames to represent the efficient method of subtracting 12.  *First subtract the 10, then subtract 2.*	**Subtracting 10s and 1s** Use a part-whole model to support the calculation. 

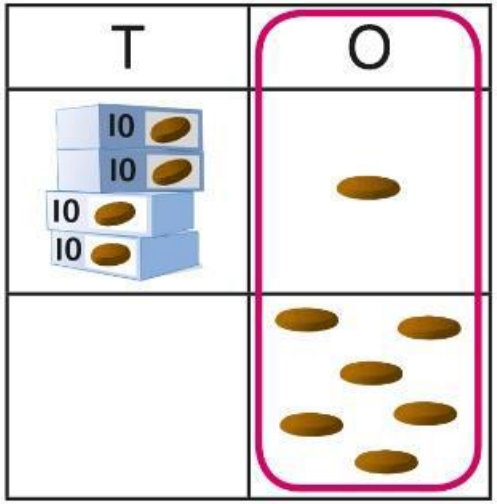
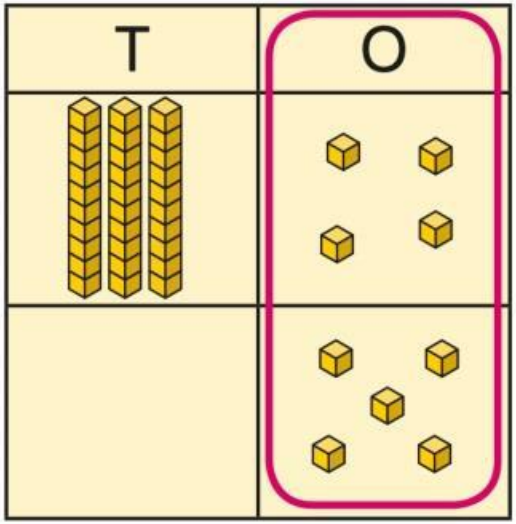
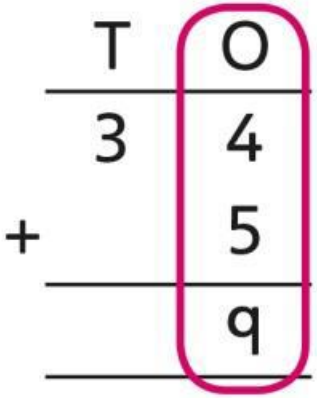
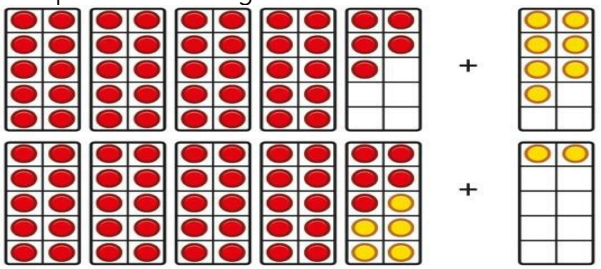
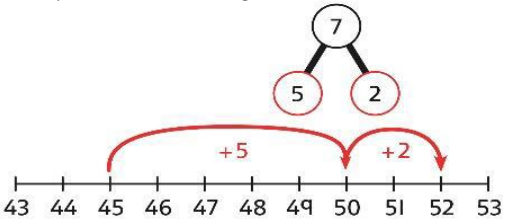
			19 – 14 *19 – 10 = 9* *9 – 4 = 5* *So, 19 – 14 = 5*
	Subtraction bridging 10 using number bonds For example: 12 – 7 Arrange objects into a 10 and some 1s, then decide on how to split the 7 into parts.  *7 is 2 and 5, so I take away the 2 and then the 5.*	**Subtraction bridging 10 using number bonds** Represent the use of bonds using ten frames.  *For 13 – 5, I take away 3 to make 10, then take away 2 to make 8.*	**Subtraction bridging 10 using number bonds** Use a number line and a part-whole model to support the method. *13 – 5* 
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.*

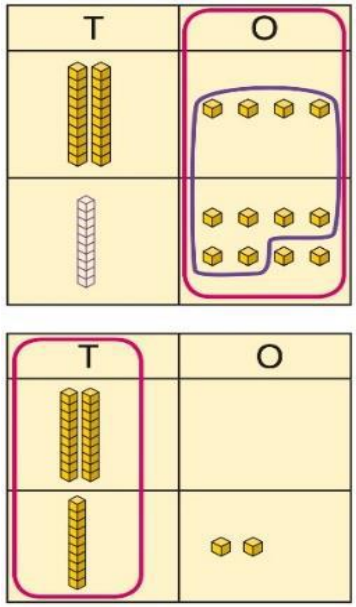
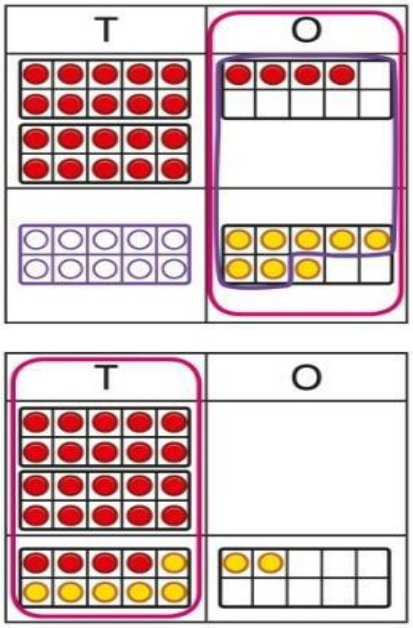
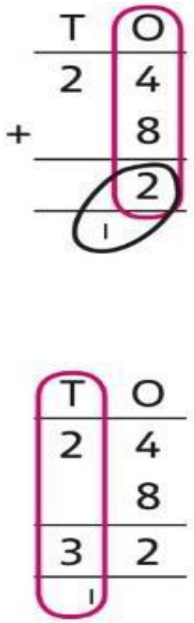
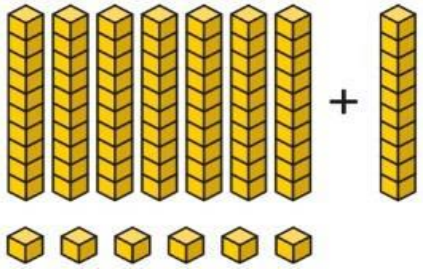
	Finding the total of equal groups by counting in 2s, 5s and 10s  There are 5 pens in each pack … 5…10…15…20…25…30…35…40…	**Finding the total of equal groups by counting in 2s, 5s and 10s** 100 squares and ten frames support counting in 2s, 5s and 10s.   1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50	**Finding the total of equal groups by counting in 2s, 5s and 10s** Use a number line to support repeated addition through 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.  *There are 10 children altogether.*	**Grouping** Represent a whole and work out how many equal groups.  *There are 10 in total.* *There are 5 in each group.*	**Grouping** Children may relate this to counting back in steps of 2, 5 or 10. 

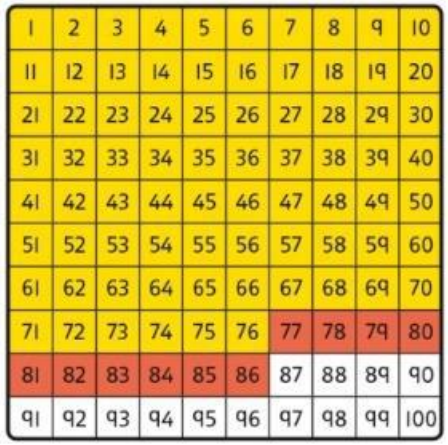
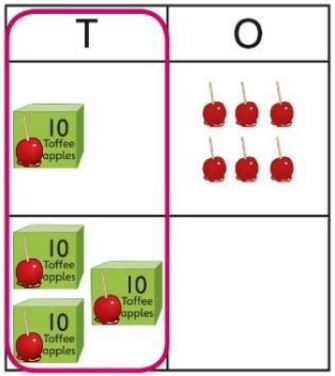
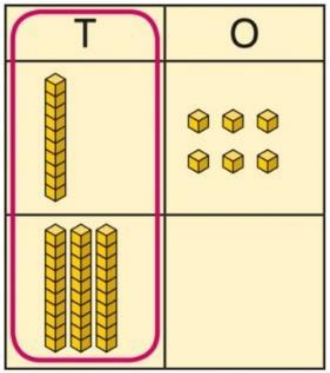
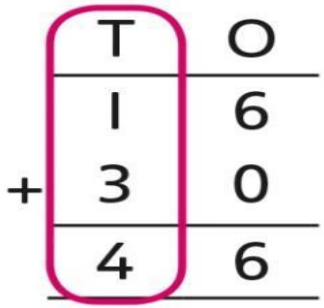
	There are 2 in each group. *There are 5 groups.*   Sharing into equal groups 6 frogs shared equally between 2 lily pads gives 3 frogs on each lily pad or Grouping in equal groups 6 frogs grouped in 2s need 3 lily pads to sit on	*There are 2 groups.* **Arrays** (rectangular arrangements to show equal 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.*

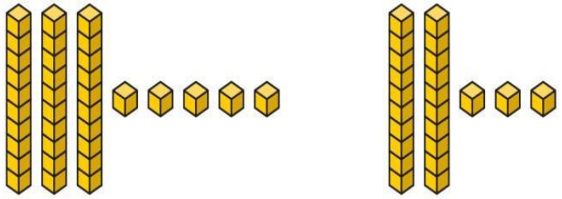
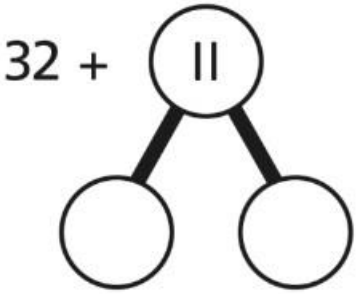
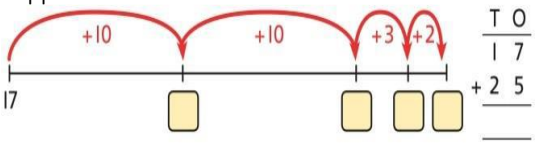
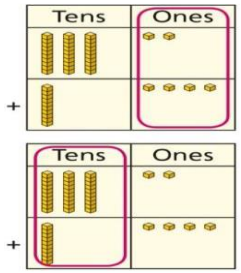
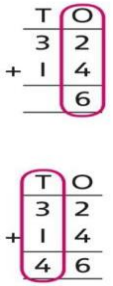
<table>
<tr><th colspan="4">Year 2</th></tr>
<tr><th></th><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr><td>Year 2
Addition</td><td></td><td></td><td></td></tr>
<tr><td>Understanding 10s and 1s</td><td>Group objects into 10s and 1s.
 
Bundle straws to understand unitising of 10s.
  </td><td>Understand 10s and 1s equipment, and link with visual representations on ten frames.
  </td><td>Represent numbers on a place value grid, using equipment or numerals.
 
<table><tr><th>Tens</th><th>Ones</th></tr><tr><td>4</td><td>3</td></tr></table></td></tr>
<tr><td>Adding 10s</td><td>Use known bonds and unitising to add 10s.
 
I know that 4 + 3 = 7.</td><td>Use known bonds and unitising to add 10s.
 
I know that 4 + 3 = 7.
So, I know that 4 tens add 3 tens is 7 tens.</td><td>Use known bonds and unitising to add 10s.</td></tr>
</table>

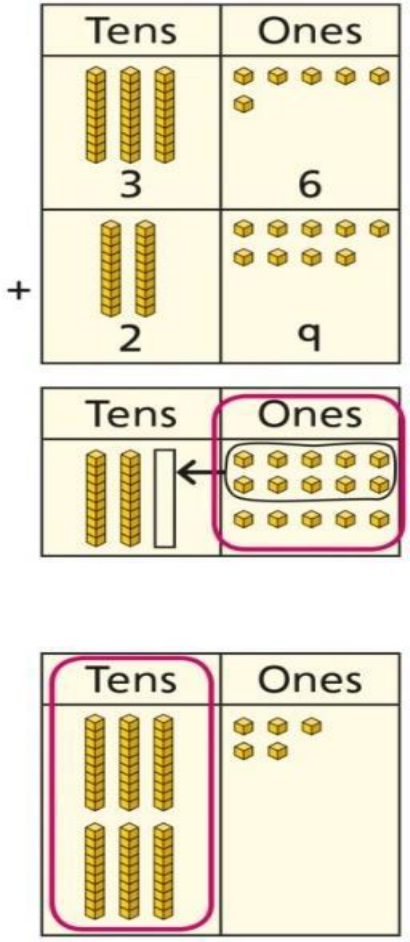
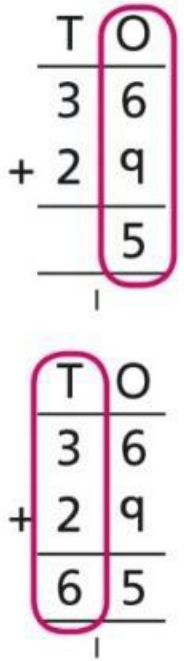
	So, I know that 4 tens add 3 tens is 7 tens.		 *4 + 3 = 7* *4 tens + 3 tens = 7 tens* *40 + 30 = 70*
Adding a 1-digit number to a 2-digit number not bridging a 10.	Add the 1s to find the total. Use known bonds within 10.  *41 is 4 tens and 1 one.* *41 add 6 ones is 4 tens and 7 ones.*	Add the 1s.  34 is 3 tens and 4 ones. 4 ones and 5 ones are 9 ones. The total is 3 tens and 9 ones.	Add the 1s. Understanding the link between counting on and using known number facts. Children should be encouraged to use known number bonds to improve efficiency and accuracy. 

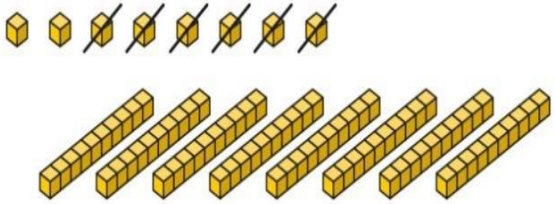
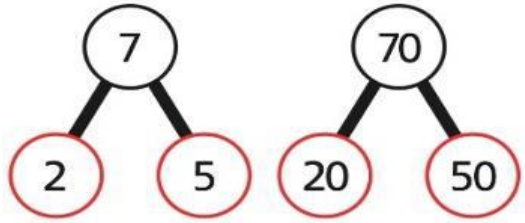
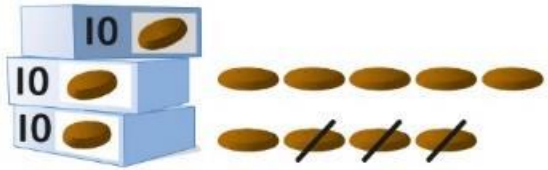
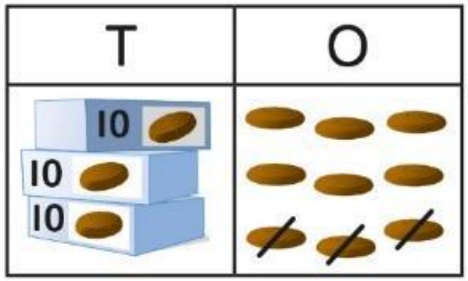
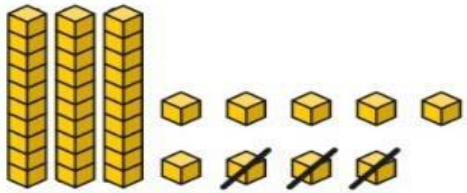
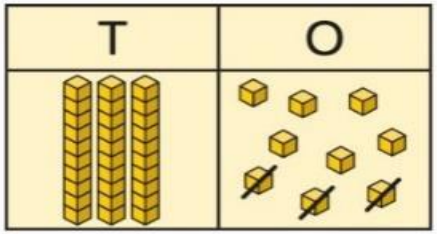
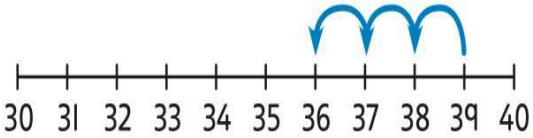
	This can also be done in a place value grid. 		This can be represented horizontally or vertically. 34+5 = 39 or 
Adding a 1-digit number to a 2-digit number not bridging a 10	Complete a 10 using number bonds.  *There are 4 tens and 5 ones.* *I need to add 7. I will use 5 to complete a 10, then add 2 more.*	Complete a 10 using number bonds. 	Complete a 10 using number bonds.  *7 = 5 + 2* *45 + 5 + 2 = 52*
Adding a 1-digit number	Exchange 10 ones for 1 ten.	Exchange 10 ones for 1 ten.	Exchange 10 ones for 1 ten.

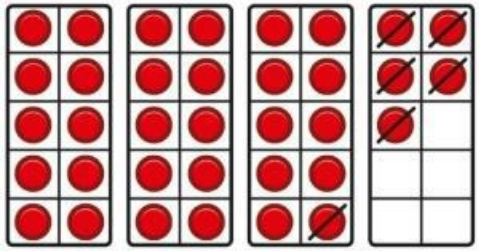
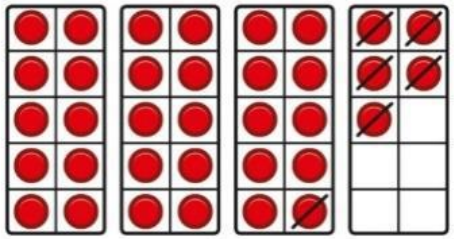
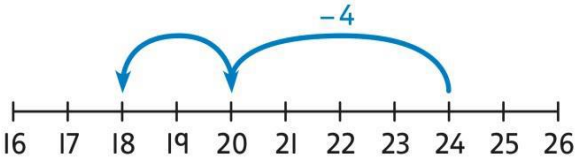
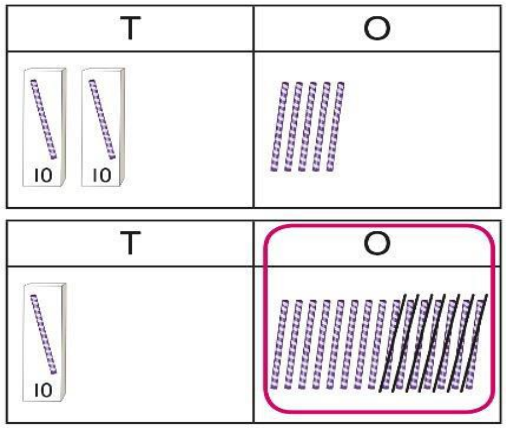
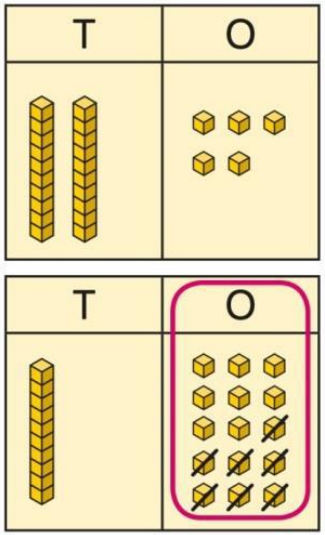
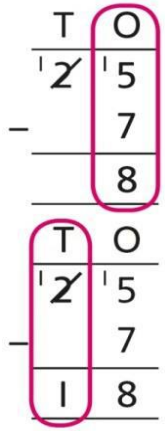
to a 2-digit number using exchange			
Adding a multiple of 10 to a 2-digit number	Add the 10s and then recombine.  *27 is 2 tens and 7 ones.* *50 is 5 tens.* *There are 7 tens in total and 7 ones.* *So, 27 + 50 is 7 tens and 7 ones.*	Add the 10s and then recombine.  *66 is 6 tens and 6 ones.* *66 + 10 = 76*	Add the 10s and then recombine. *37 + 20 = ?* *30 + 20 = 50* *50 + 7 = 57* *37 + 20 = 57* 40+20=60 6+7 =13 60+13=73

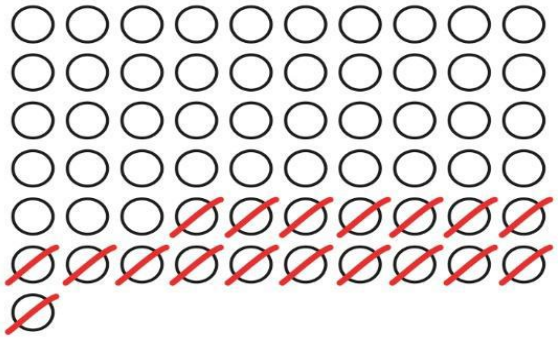
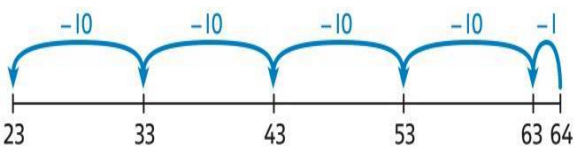
		A 100 square can support this understanding.  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	Moving on to: 46 + 27 = 60 + 13 = 73 **Balance in the equation** 14 = 8 + 6, 7+6=8+5 □= 13+9 3+ □+6 =16 14+ ◇= 15+27
Adding a multiple of 10 to a 2-digit number using columns	Add the 10s using a place value grid to support.  T O 10 Toffee Apples 10 Toffee Apples 10 Toffee Apples 10 Toffee Apples *16 is 1 ten and 6 ones.* *30 is 3 tens.* *There are 4 tens and 6 ones in total.*	Add the 10s using a place value grid to support.  T O *16 is 1 ten and 6 ones.* *30 is 3 tens.* *There are 4 tens and 6 ones in total.*	Add the 10s represented vertically. Children must understand how the method relates to unitising of 10s and place value.  T O 1 6 + 3 0 4 6 *1 + 3 = 4* *1 ten + 3 tens = 4 tens* *16 + 30 = 46*

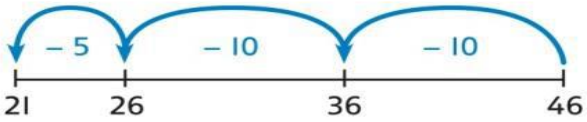
Adding two 2-digit numbers	Add the 10s and 1s separately.  *5 + 3 = 8* *There are 8 ones in total.* *3 + 2 = 5* *There are 5 tens in total.* *35 + 23 = 58*	Add the 10s and 1s separately. Use a part-whole model to support.  *11 = 10 + 1* *32 + 10 = 42* *42 + 1 = 43* *32 + 11 = 43*	Add the 10s and the 1s separately, bridging 10s where required. A number line can support the calculations.  *17 + 25*
Adding two 2-dogot numbers using a place value grid.	Add the 1s. Then add the 10s.  		Add the 1s. Then add the 10s 

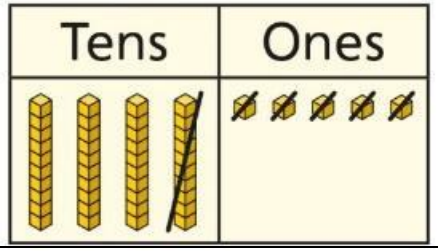
Adding two 2-digit numbers using a place value grid	Add the Is. Exchange 10 ones for a ten. Then add the 10s. 		Add the Is. Exchange 10 ones for a ten. Then add the 10s. 

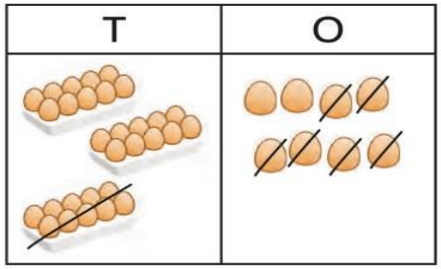
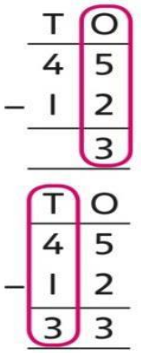
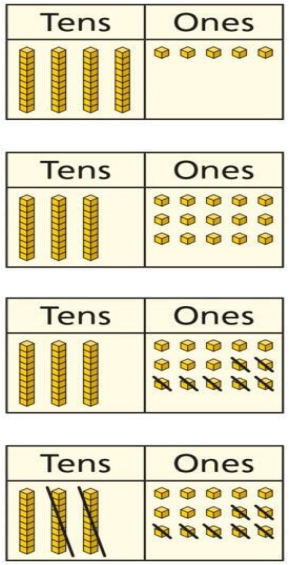
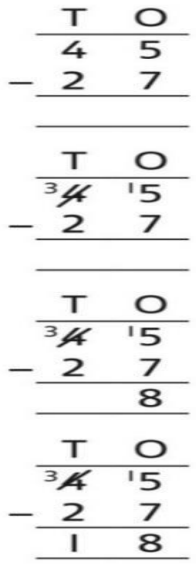
Year 2 Subtraction			
Subtracting multiples of 10	Use known number bonds and unitising to subtract multiples of 10.  *8 subtract 6 is 2.* *So, 8 tens subtract 6 tens is 2 tens.*	Use known number bonds and unitising to subtract multiples of 10.  *10 – 3 = 7* *So, 10 tens subtract 3 tens is 7 tens.*	Use known number bonds and unitising to subtract multiples of 10.  *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.  T O 3 9 – 3 3 6 9 – 3 = 6 39 – 3 = 36

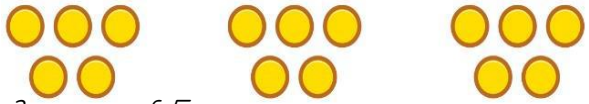
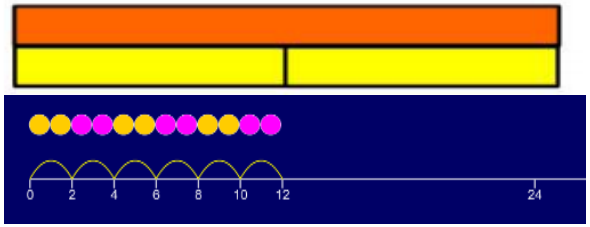
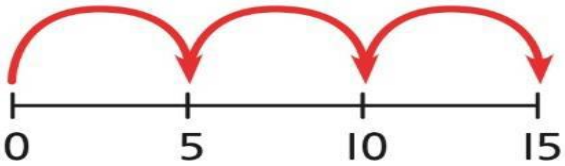
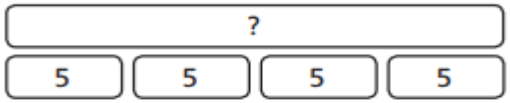
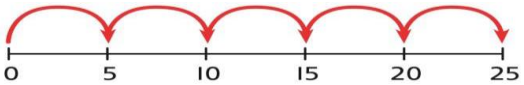
Subtracting a single-digit number bridging 10	Bridge 10 by using known bonds.  *35 – 6* *I took away 5 counters, then I more.*	Bridge 10 by using known bonds.  *35 – 6* *First, I will subtract 5, then 1.*	Bridge 10 by using known bonds.  *24 – 6 = ?* *24 – 4 – 2 = ?*
Subtracting a single-digit number using exchange	Exchange 1 ten for 10 ones. This may be done in or out of a place value grid. 	Exchange 1 ten for 10 ones. 	Exchange 1 ten for 10 ones.  *25 – 7 = 18*

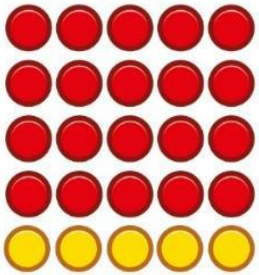
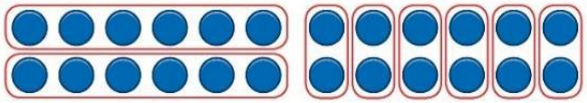
<table>
<tr>
<td>Subtracting a 2-digit number</td>
<td>Subtracting by taking away.
 
61 – 18
I took away 1 ten and 8 ones.</td>
<td>Subtract the 10s and the 1s.
This can be represented on a 100 square.
<table>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
<tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr>
<tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr>
<tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr>
<tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr>
<tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr>
<tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr>
<tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr>
<tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr>
<tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr>
</table>
</td>
<td>Subtract the 10s and the 1s.
This can be represented on a number line.
 

64 – 41 = ?
64 – 1 = 63
63 – 40 = 23
64 – 41 = 23
 

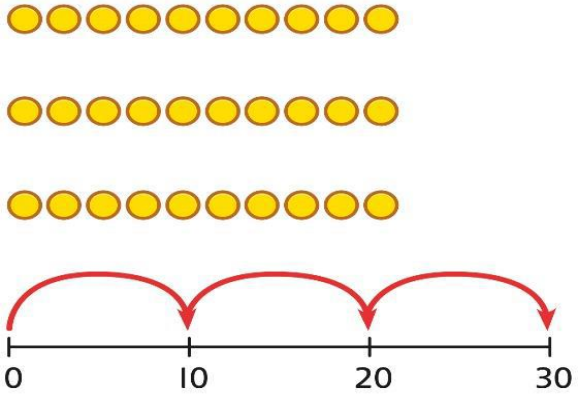
46 – 20 = 26
26 – 5 = 21
46 – 25 = 21</td>
</tr>
<tr>
<td>Subtracting a 2-digit number using place value and columns</td>
<td>Subtract the 1s. Then subtract the 10s.
This may be done in or out of a place value grid.</td>
<td>Subtract the 1s. Then subtract the 10s.
 
</td>
<td>Using column subtraction, subtract the 1s. Then subtract the 10s.</td>
</tr>
</table>

	 *38 – 16 = 22*		
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. 

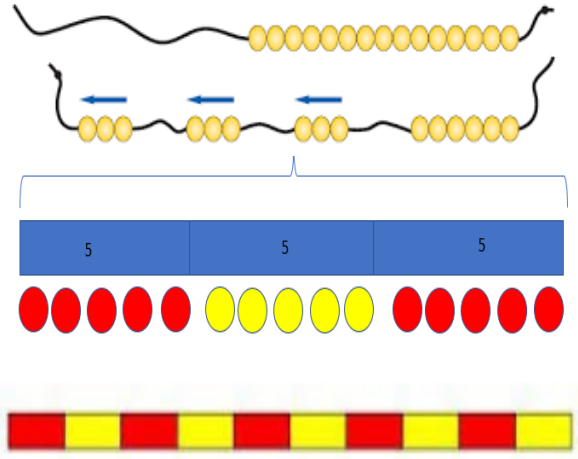
Year 2 Multiplication			
Equal groups and repeated addition	Recognise equal groups and write as repeated addition and as multiplication.  *3 groups of 5 chairs* *15 chairs altogether*	Recognise equal groups using standard objects such as counters and write as repeated addition and multiplication.  *3 groups of 5* *15 in total* Use Cuisenaire rods to create simple bar models. 	Use a number line and write as repeated addition and as multiplication.  *5 + 5 + 5 = 15* *3 × 5 = 15* Or Use bar models to reinforce understanding. 
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.  *5 × 5 = 25*

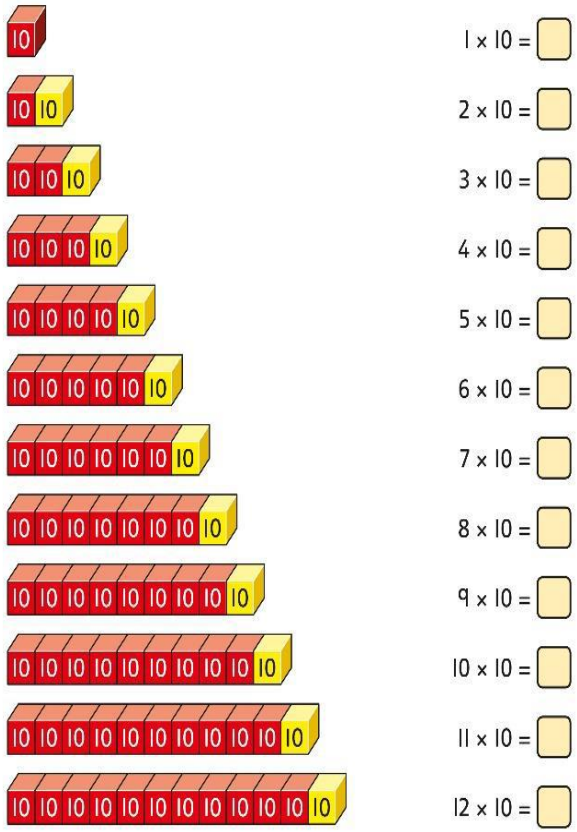
	 *4 groups of 5*	 *4 groups of 5 . . . 5 groups of 5*	
Understanding commutativity	Use arrays to visualise commutativity.  *I can see 6 groups of 3.* *I can see 3 groups of 6.*	Form arrays using counters to visualise commutativity. Rotate the array to show that orientation does not change the multiplication.  *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 × 5 = 20 and 5 × 4 = 20*
Learning ×2, ×5 and ×10 table facts	Develop an understanding of how to unitise groups of 2, 5 and 10 and learn corresponding times-table facts.	Understand how to relate counting in unitised groups and repeated addition with knowing key times-table facts.	Understand how the times-tables increase and contain patterns.

3 groups of 10 . . . 10, 20, 30
3 × 10 = 30

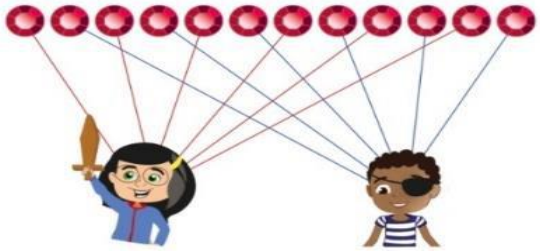
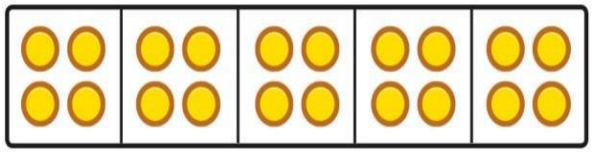
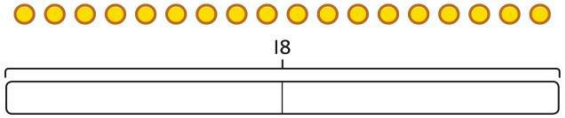


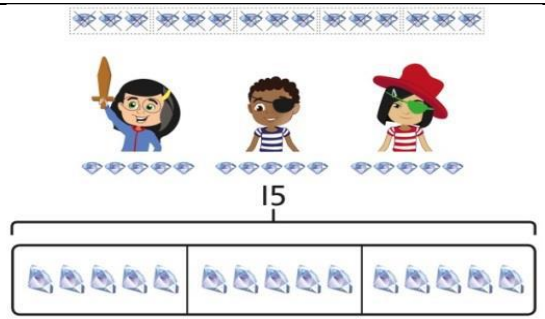
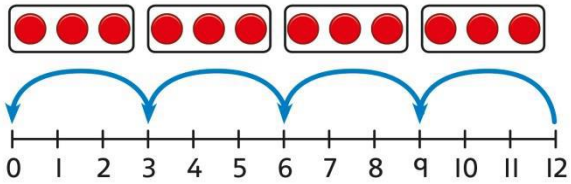
10 + 10 + 10 = 30
3 × 10 = 30

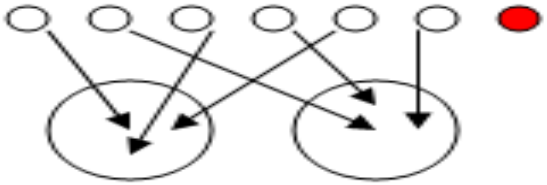
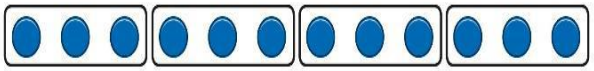
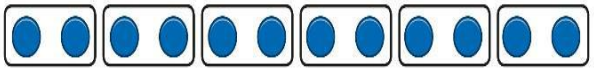


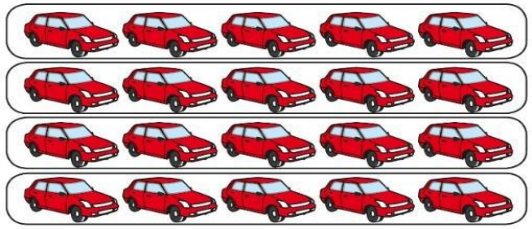
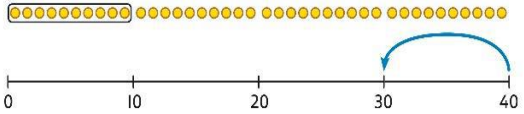
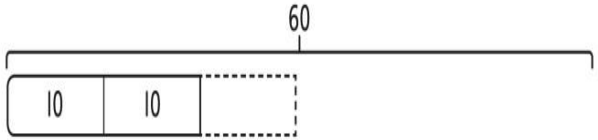
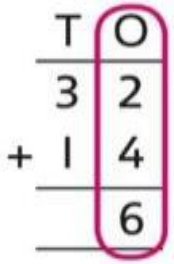
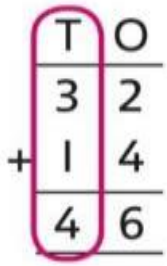


5x10=50
6x10=60

		Build tables using counting stick- forwards and backwards and with missing jumps using doubling and halving.	
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.* Start to understand how this also relates to grouping. To share equally between 3 people, take a group of 3 and give 1 to each person. Keep going until all the objects have been shared	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*

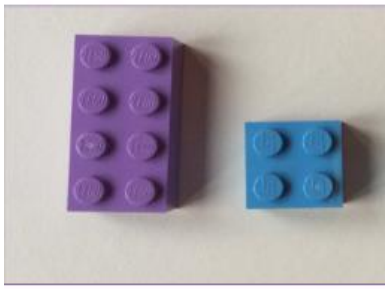
	 *15 shared equally between 3.* *They get 5 each.*		
Grouping Equally	Understand how to make equal groups from a whole.  *8 divided into 4 equal groups.* *There are 2 in each group.*	Understand the relationship between grouping and the division statements.  20 ÷ 2 = 10	Understand how to relate division by grouping to repeated subtraction.  *12 divided into groups of 3.* *12 ÷ 3 = 4* *There are 4 groups.*

		There are 7 cakes and 2 children. How many cakes will they get each? (Leftovers/remainders introduced)  7 ÷ 2 = 3r1 12 ÷ 3 = 4  12 ÷ 4 = 3  12 ÷ 6 = 2  12 ÷ 2 = 6 	

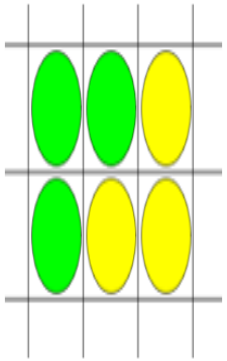
Using known times-tables to solve divisions.	Understand the relationship between multiplication facts and division.  *4 groups of 5 cars is 20 cars in total.* *20 divided by 4 is 5.*	Link equal grouping with repeated subtraction and known times-table facts to support division.  *40 divided by 4 is 10.*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

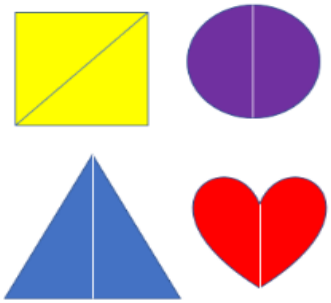
Progression in Fractions – KS1

Y1 Concrete	Y1 Pictorial	Y1 Abstract
Objective 1: Recognise, find and name a half as one of two equal parts of an object, shape or quantity.		

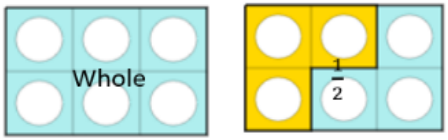


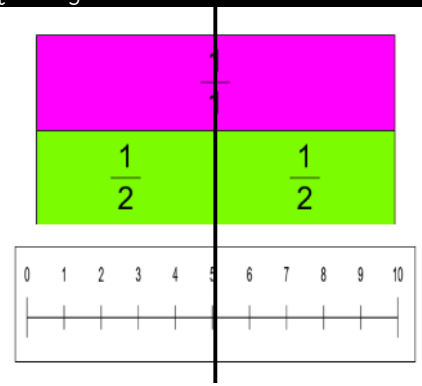
8 4





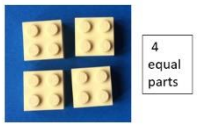
How many ways can you show $\frac{1}{2}$?

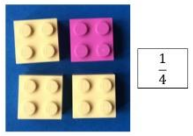




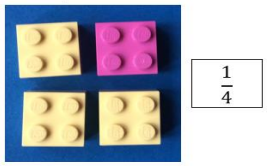
$\frac{1}{2}$ *of* $8 = 4$

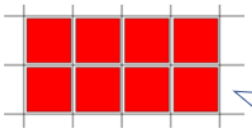
Objective 2: Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.



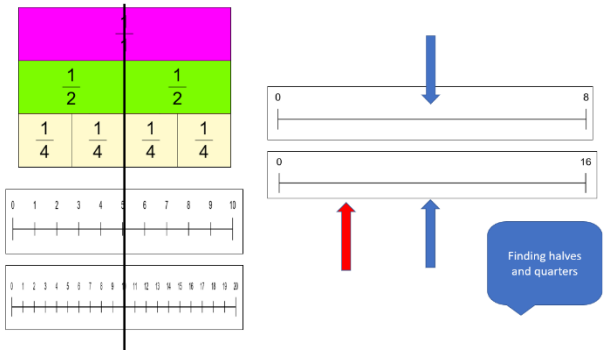


How many ways can you show $\frac{1}{4}$?



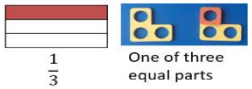


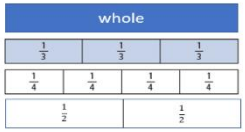
How many different ways can you show $\frac{1}{4}$ of these counters?

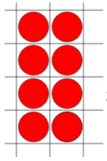


Y2 Concrete	Y2 Pictorial	Y2 Abstract

Objective 1: Recognise, find, name and write fractions 1/3 , □ , 2/4 and □ of a length, shape, set of objects or quantities.

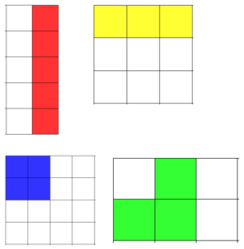


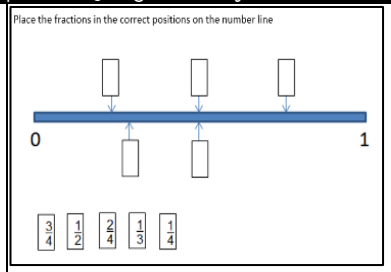


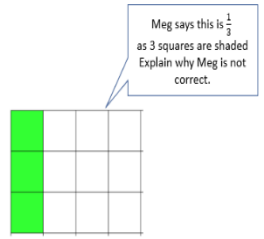


How many different ways can you show $\frac{1}{2}$ and $\frac{1}{4}$ of these counters?

Write the fraction that is shaded.

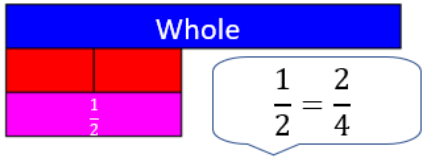


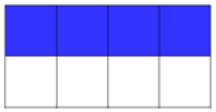




Objective 2: Write simple fractions and recognise the equivalence of and 2/4

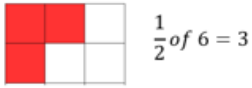
$\frac{1}{2} = \frac{2}{4}$



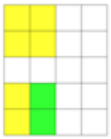


$\frac{1}{2}$ of $8 = 4$

Show that $\frac{1}{2} = \frac{2}{4}$

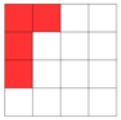


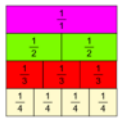
$\frac{1}{2}$ of $6 = 3$



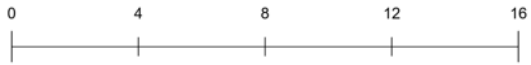
$\frac{1}{2}$ of $8 = 4$

$\frac{2}{4}$ of $8 = 4$

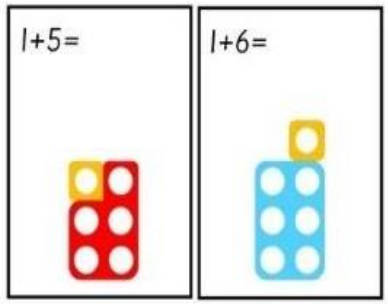
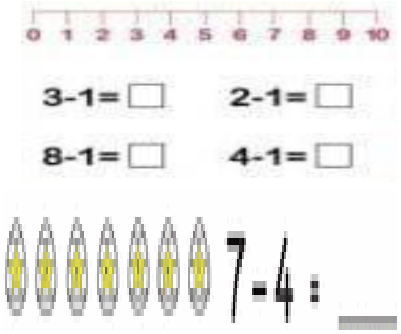
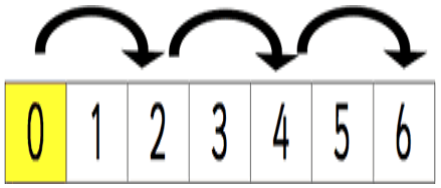
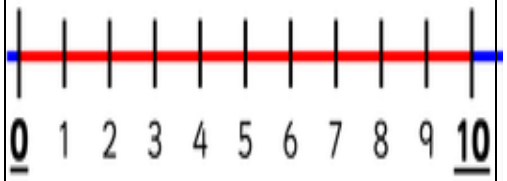
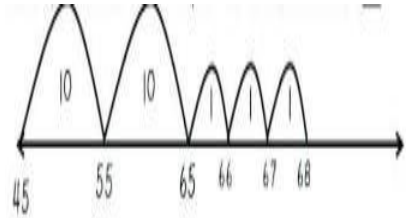
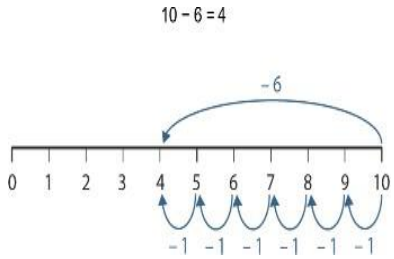
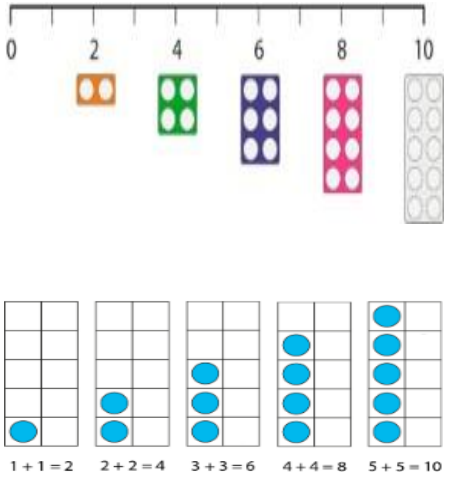




Odd one out



Standard Written Method

	Addition	Subtraction	Multiplication	Division
Reception				
Year 1				

Year 2	59 ^{1}43+ 102	$^{6}7^{1}3$ 49- 24	8 x 5 = 40	35 ÷ 5 = 7
Year 3	523 $_{1}$393+ 916	$^{4}{}^{1}$523 393- 130	59 6x 54 (6x9) 300 (6x50) 354	$\begin{array}{r} 4 \\ 8\overline{)32} \end{array}$
Year 4	1,312 3,094+ 4,406	$^{1}{}^{1}$6,273 1,093- 5,180	159 16x954 $^{1}{}^{1}$1,590+ 2,544	$\begin{array}{r} 135 \\ 7\overline{)945} \end{array}$

Year 5	13,123 30,943+ 44,066	62,743 10,923- 51,820	2259 6x 54 300 1,200 12,000+ 13,554	279 r 5 6) 1679
Year 6	613,123 1310,943+ 744,066	6112,1743 100,923- 511,820	2259 46x 13,554 901,360+ 103,914	0389.739 23 8964 69- 206 184- 0224 207- 0170 161- 0090 69- 210 207- 003 23 46 69 92 115 138 161 184 207