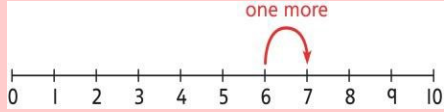
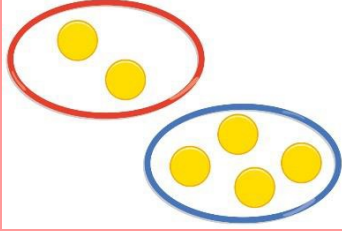
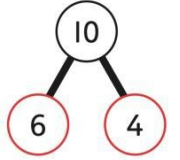
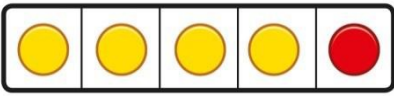
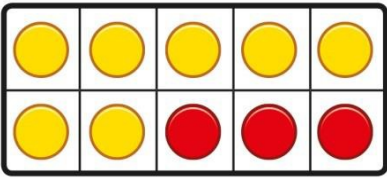
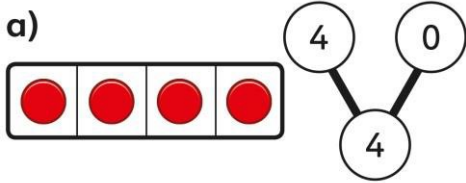
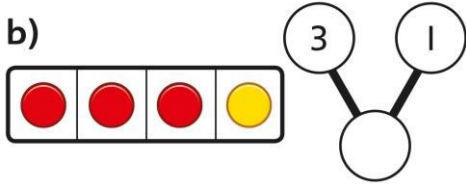


Year 1

	Concrete	Pictorial	Abstract
Counting and adding more	Children add one more person or object to a group to find one more.  The parts are 2 and 4. The whole is 6.	Children add one more cube or counter to a group to represent one more.  One more than 4 is 5.	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.
Finding the whole from two parts	Sort people and objects into parts and understand the relationship with the whole.  The parts are 2 and 4. The whole is 6.	Understanding part-part-whole relationship Children draw to represent the parts and understand the relationship with the whole.  The parts are 1 and 5. The whole is 6.	Understanding part-part-whole relationship Use a part-whole model to represent the numbers.  $6 + 4 = 10$ $6 + 4 = 10$
Knowing and finding number bonds within 10	Break apart a group and put back together to find and form number bonds.  $3 + 4 = 7$  $6 = 2 + 4$	Use five and ten frames to represent key number bonds.  $5 = 4 + 1$  $10 = 7 + 3$	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)  $4 + 0 = 4$ $3 + 1 = 4$

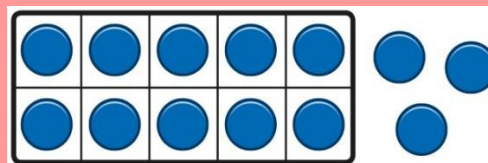
Understanding teen numbers as a complete 10 and some more

Complete a group of 10 objects and count more.



13 is 10 and 3 more.

Use a ten frame to support understanding of a complete 10 for teen numbers.

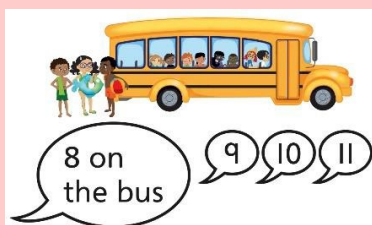


13 is 10 and 3 more.

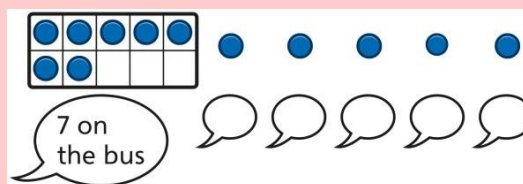
*1 ten and 3 ones equal 13.
 $10 + 3 = 13$*

Adding by counting on

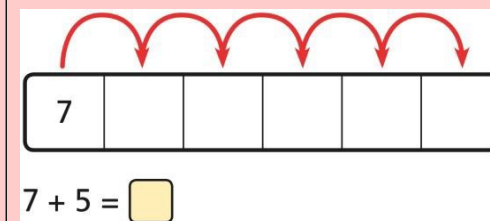
Children use knowledge of counting to 20 to find a total by counting on using people or objects.



Children use counters to support and represent their counting on strategy.



Children use number lines or number tracks to support their counting on strategy.



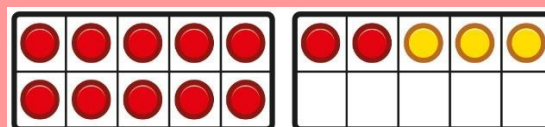
Adding the 1s

Children use bead strings to recognise how to add the 1s to find the total efficiently.



$2 + 3 = 5$
 $12 + 3 = 15$

Children represent calculations using ten frames to add a teen and 1s.



$2 + 3 = 5$
 $12 + 3 = 15$

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, $13 + 5 = 18$

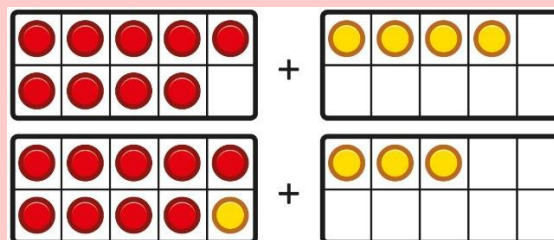
Bridging the 10 using number bonds

Children use a bead string to complete a 10 and understand how this relates to the addition.

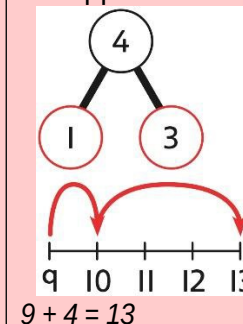


*7 add 3 makes 10.
So, 7 add 5 is 10 and 2 more.*

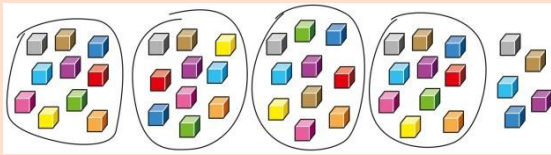
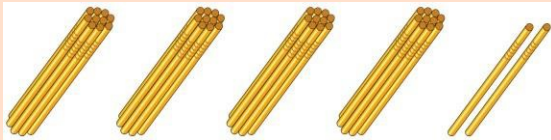
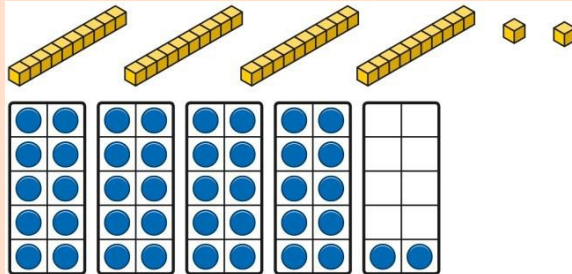
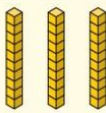
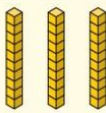
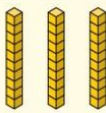
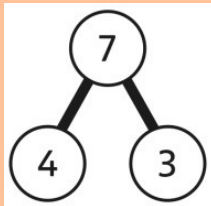
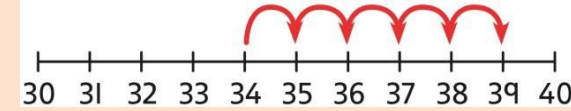
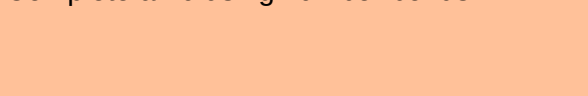
Children use counters to complete a ten frame and understand how they can add using knowledge of number bonds to 10.

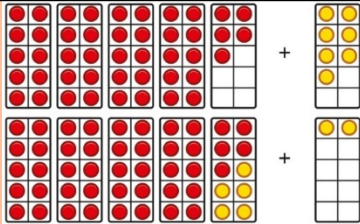
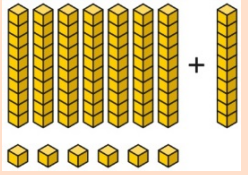
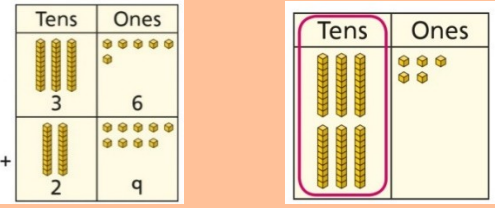


Use a part-whole model and a number line to support the calculation.

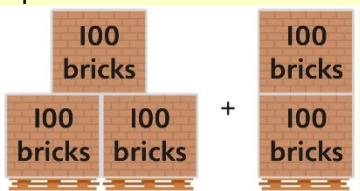
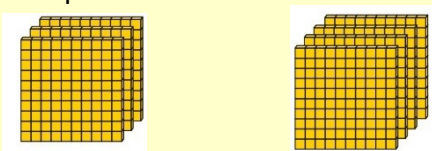
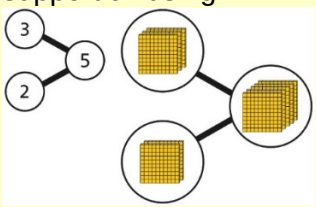


Year 2

	Concrete	Pictorial	Abstract										
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. <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td>3</td><td>2</td></tr><tr><th>Tens</th><th>Ones</th></tr><tr><td>4</td><td>3</td></tr></table>	Tens	Ones			3	2	Tens	Ones	4	3
Tens	Ones												
													
3	2												
Tens	Ones												
4	3												
Adding 10s	Use known bonds and unitising to add 10s.  <i>I know that $4 + 3 = 7$. So, I know that 4 tens add 3 tens is 7 tens.</i>	Use known bonds and unitising to add 10s.  <i>I know that $4 + 3 = 7$. So, I know that 4 tens add 3 tens is 7 tens.</i>	Use known bonds and unitising to add 10s.  $4 + 3 = 7$. 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.  <i>41 is 4 tens and 1 one. 41 add 6 ones is 4 tens and 7 ones.</i>	Add the 1s.  <i>34 is 3 tens and 4 ones. 4 ones and 5 ones are 9 ones. The total is 3 tens and 9 ones.</i>	Understand the link between counting on and using known number facts. Children should be encouraged to use known number bonds to improve efficiency and accuracy.  <i>I know that $4 + 5 = 9$. So I know that $34 + 6 = 39$</i>										
Adding a 1-digit number to a 2-digit number bridging 10	Complete a 10 using number bonds.  <i>There are 4 tens and 5 ones. I need to add 7. I will use 5 to complete a 10, then add 2 more.</i>	Complete a 10 using number bonds. 	Complete a 10 using number bonds.  <i>7 = 5 + 2. $45 + 5 + 2 = 52$</i>										

			
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. 2 tens + 5 tens = 7 tens. 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. $37 + 20 = ?$ $30 + 20 = 50$ $50 + 7 = 57$
Adding two 2-digit numbers	Exchange 10 ones for 1 ten. 	Draw the rods and cubes to represent the calculation. 	Only to be introduced to more confident mathematicians. Exchange 10 ones for 1 ten 

Year 3

	Concrete	Pictorial	Abstract
Adding 100s	Use known facts and unitising to add multiples of 100.  $3 + 2 = 5$ $3 \text{ hundreds} + 2 \text{ hundreds} = 5 \text{ hundreds}$ $300 + 200 = 500$	Use known facts and unitising to add multiples of 100.  $3 + 4 = 7$ $3 \text{ hundreds} + 4 \text{ hundreds} = 7 \text{ hundreds}$ $300 + 400 = 700$	Use known facts and unitising to add multiples of 100. Use a part-whole model to support unitising.  $3 + 2 = 5$ $300 + 200 = 500$

3-digit number + 1s or 10s, no exchange or bridging

Calculate mentally by forming the number bond for the 10s.



$234 + 50$
 $234 = 2 \text{ hundreds and } 3 \text{ tens and } 4 \text{ ones.}$
 $50 = 5 \text{ tens.}$
 $3 \text{ tens} + 5 \text{ tens} = 8 \text{ tens.}$
 $234 + 50 = 284$

Calculate mentally by forming the number bond for the 10s.

$$351 + 30 = ?$$

H	T	O

$5 \text{ tens} + 3 \text{ tens} = 8 \text{ tens}$
 $351 + 30 = 381$

Calculate mentally by forming the number bond for the 10s.

$$753 + 40$$

I know that $5 + 4 = 9$

So, $50 + 40 = 90$
 $753 + 40 = 793$

3-digit number + 1 or 10s with exchange

Understand that when the 1s sum to 10 or more, this requires an exchange of 10 ones for 1 ten.

Children should explore this using unitised objects or physical apparatus.

Exchange 10 ones for 1 ten where needed. Use a place value grid to support the understanding.

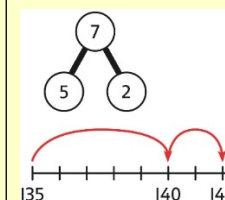
H	T	O

H	T	O

H	T	O

$$135 + 7 = 142$$

Understand how to bridge by partitioning to the 1s to make the next 10. Ensure that children understand how to add 1s bridging a 100.



$$135 + 7 = ?$$

$$135 + 5 + 2 = 142$$

3-digit number + 2-digit number or 3-digit number, no exchange

Use place value equipment to make a representation of a calculation. This will be structured in a place value grid.

$326 + 541$ is represented as:

H	T	O

Represent the place value grid by drawing equipment to model the stages of column addition.

Use a column method to solve efficiently, using known bonds. Children must understand how this relates to place value at every stage of the calculation.

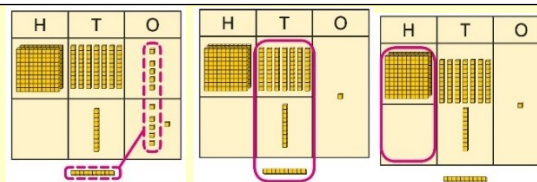
3-digit number + 2-digit or 3-digit number, exchange required

Use place value equipment to model addition and understand where exchange is required.

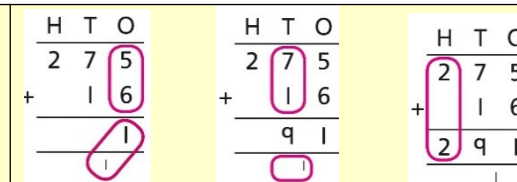
Represent the required exchange on a place value grid using equipment.

Use a column method with exchange. Children must understand how the method relates to place value at each stage of the calculation.

Use place value counters to decide if any exchange is required.
There are 5 tens and 7 tens. That is 12 tens so I will exchange.



$$275 + 16 = 291$$



$$275 + 16 = 291$$

Year 4

	Concrete	Pictorial	Abstract
Choosing mental methods where appropriate	Use unitising and known facts to support mental calculations. Make 4,256 from place value equipment. Make 300 Now add the hundreds 2 hundreds + 3 hundreds = 5 hundreds $4,256 + 300 = 4,556$	Use unitising and known facts to support mental calculations. $4,256 + 300 = 4,556$ $200 + 300 = 500$ So, $4,256 + 300 = 4,556$	Use unitising and known facts to support mental calculations. $4,256 + 300 = ?$ $2 + 3 = 5$ $200 + 300 = 500$ $4,256 + 300 = 4,556$
Column addition with exchange	Use place value equipment on a place value grid to organise thinking. Ensure that children understand how the columns relate to place value and what to do if the numbers are not all 4-digit numbers. Use equipment to show and solve $1,905 + 775$.	Use place value equipment to model required exchanges. Include examples that exchange in more than one column.	Use a column method to add, including exchanges. Include examples that exchange in more than one column.
Representing additions and checking strategies		Bar models may be used to represent additions in problem contexts, and to justify mental methods where appropriate.	Use rounding and estimating to check the reasonableness of an addition. $912 + 6,149 = ?$

O	Tth	Hth
●●●●●		
●	●●	●●●●●

O	Tth	Hth
5	0	0
1	2	5
6	2	5

O	Tth	Hth
0	9	2
0	3	3
1	2	5

Include additions where the numbers of decimal places are different.

O	Tth	Hth
3	4	0
0	6	5

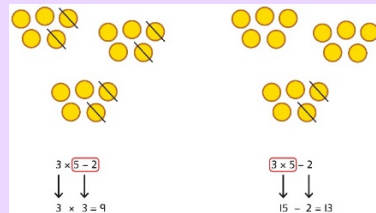
Year 6

	Concrete	Pictorial	Abstract																																																																																														
Comparing and selecting efficient methods	Represent 7-digit numbers on a place value grid, and use this to support thinking and mental methods. <table><tr><td>M</td><td>HTh</td><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td>●●</td><td>●●●●●</td><td>●</td><td>●</td><td>●●●</td><td></td><td>●</td></tr></table>	M	HTh	TTh	Th	H	T	O	●●	●●●●●	●	●	●●●		●	Discuss similarities and differences between methods, and choose efficient methods based on the specific calculation. Compare written and mental methods alongside place value representations. <table><tr><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td>●●●</td><td></td><td>●●</td><td>●●●●●</td><td>●●●●●</td></tr><tr><td></td><td>●●●</td><td>●●●</td><td>●●●</td><td>●●●</td></tr></table> Use bar model and number line representations to model addition in problem-solving and measure contexts.	TTh	Th	H	T	O	●●●		●●	●●●●●	●●●●●		●●●	●●●	●●●	●●●	Use column addition where mental methods are not efficient. Recognise common errors with column addition. 32,145 + 4,302 = ? <table><tr><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td>3</td><td>2</td><td>1</td><td>4</td><td>5</td></tr><tr><td>+</td><td>4</td><td>3</td><td>0</td><td>2</td></tr><tr><td>3</td><td>6</td><td>4</td><td>4</td><td>7</td></tr></table> <table><tr><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td>3</td><td>2</td><td>1</td><td>4</td><td>5</td></tr><tr><td>+</td><td>4</td><td>3</td><td>0</td><td>2</td></tr><tr><td>7</td><td>5</td><td>1</td><td>6</td><td>5</td></tr></table> Column methods are also used for decimal additions where mental methods are not efficient. <table><tr><td>H</td><td>T</td><td>O</td><td>·</td><td>Tth</td><td>Hth</td></tr><tr><td>1</td><td>4</td><td>0</td><td>·</td><td>0</td><td>9</td></tr><tr><td>+</td><td></td><td>4</td><td>9</td><td>·</td><td>8</td><td>9</td></tr><tr><td>1</td><td>8</td><td>9</td><td>·</td><td>9</td><td>8</td></tr></table>	TTh	Th	H	T	O	3	2	1	4	5	+	4	3	0	2	3	6	4	4	7	TTh	Th	H	T	O	3	2	1	4	5	+	4	3	0	2	7	5	1	6	5	H	T	O	·	Tth	Hth	1	4	0	·	0	9	+		4	9	·	8	9	1	8	9	·	9	8
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Selecting mental methods for larger numbers where appropriate	Represent 7-digit numbers on a place value grid, and use this to support thinking and mental methods. <table><tr><td>M</td><td>HTh</td><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td>●●</td><td>●●●●●</td><td>●</td><td>●</td><td>●●●</td><td></td><td>●</td></tr></table> 2,411,301 + 500,000 = ? This would be 5 more counters in the HTh place. So, the total is 2,911,301. 2,411,301 + 500,000 = 2,911,301	M	HTh	TTh	Th	H	T	O	●●	●●●●●	●	●	●●●		●	Use a bar model to support thinking in addition problems. 257,000 + 99,000 = ? <table><tr><td colspan="2">?</td></tr><tr><td>£257,000</td><td>£100,000</td></tr></table> I added 100 thousands then subtracted 1 thousand. 257 thousands + 100 thousands = 357 thousands 257,000 + 100,000 = 357,000 357,000 – 1,000 = 356,000 So, 257,000 + 99,000 = 356,000	?		£257,000	£100,000	Use place value and unitising to support mental calculations with larger numbers. 195,000 + 6,000 = ? 195 + 5 + 1 = 201 195 thousands + 6 thousands = 201 thousands So, 195,000 + 6,000 = 201,000																																																																												
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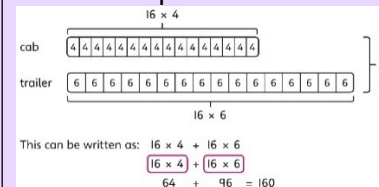
Understanding order of operations in calculations

Use equipment to model different interpretations of a calculation with more than one operation. Explore different results.

$$3 \times 5 - 2 = ?$$



Model calculations using a bar model to demonstrate the correct order of operations in multi-step calculations.



Understand the correct order of operations in calculations without brackets.

Understand how brackets affect the order of operations in a calculation.

$$4 + 6 \times 16$$

$$4 + 96 = 100$$

$$(4 + 6) \times 16$$

$$10 \times 16 = 160$$