The curriculum that we have constructed is supported by the belief that maths is a core means of introducing essential everyday concepts, skills and thinking strategies and we aim for every child to enjoy and relish the mathematical opportunities we provide.

At The Oaks, we delight in our children making connections, asking questions and being actively curious within our systematic and connected curriculum. It encourages children to be daring mathematicians who query their answers with resilience and reasoning, supporting every child's high expectations of their mathematical fluency, understanding and flexibility in solutions.

As we believe that each child can be a successful mathematician, the opportunity to extend every child's understanding is made accessible, actively encouraged and weaved in through the expertise of all teaching staff. Through the ongoing research within school, we recognise the considerable weighting that great depth challenges have and believe that they are an essential part of the mathematical learning journey.

Throughout every year group, the curriculum is designed to be rooted a *Concrete, Pictorial and Abstract Approach* which continually and consistently connects each mathematical concept. Formal methods that are included are deep-rooted in mathematical research and underlying concepts.

Our mathematical journey is weaved in throughout the curriculum, to ensure each child's development into a successful adult. We understand the crucial contribution that mathematical understanding has to financial literacy, science, technology and engineering, and its contribution to our culture, society and economy.

Our CPA curriculum is based on the Power Maths CPA Calculation Policy, supported by the Government Guidance Ready to Progress criteria. Additionally, through CPA training and teaching group research, we have added vocabulary and further questioning as these are key priorities in our School Development Plan.

These are a minimum of representations and models that can be used. Additional representations and models should be used by the teaching staff to aid the Addition and Subtraction learning journey.

Contents

Questioning Stems

Addition and Subtraction Calculation Sequence

Using Questioning to stimulate mathematical thinking within lessons

(Source: Way. J, 2014, https://nrich.maths.org/2473)

Within the context of open-ended mathematical tasks, it is useful to group questions into four main categories (Badham, 1994). These questions can be used be the teacher to guide the children through investigations while stimulating their mathematical thinking and gathering information about their knowledge and strategies.

1. *Starter questions*
These take the form of open-ended questions which focus the children's thinking in a general direction and give them a starting point. Examples:
How could you sort these.......?
How many ways can you find to .... ?
What happens when we .... ?
What can be made from....?
How many different .... can be found?

2. *Questions to stimulate mathematical thinking*
These questions assist children to focus on particular strategies and help them to see patterns and relationships. This aids the formation of a strong conceptual network. The questions can serve as a prompt when children become 'stuck'. (Teachers are often tempted to turn these questions into instructions, which is far less likely to stimulate thinking and removes responsibility for the investigation from the child).
Examples:
What is the same?
What is different?
Can you group these .... in some way?
Can you see a pattern?
How can this pattern help you find an answer?
What do think comes next? Why?
Is there a way to record what you've found that might help us see more patterns?
What would happen if....?

3. *Assessment questions*
Questions such as these ask children to explain what they are doing or how they arrived at a solution. They allow the teacher to see how the children are thinking, what they understand and what level they are operating at. Obviously they are best asked after the children have had time to make progress with the problem, to record some findings and perhaps achieved at least one solution.
Examples:

What have you discovered?
How did you find that out?
Why do you think that?
What made you decide to do it that way?

4. *Final discussion questions*
These questions draw together the efforts of the class and prompt sharing and comparison of strategies and solutions. This is a vital phase in the mathematical thinking processes. It provides further opportunity for reflection and realisation of mathematical ideas and relationships. It encourages children to evaluate their work.
Examples:
Who has the same answer/ pattern/ grouping as this?
Who has a different solution?
Are everybody's results the same?
Why/why not?
Have we found all the possibilities?
How do we know?
Have you thought of another way this could be done?
Do you think we have found the best solution?

Reception
Mathematics Early Years Outcomes **ELG: Number**

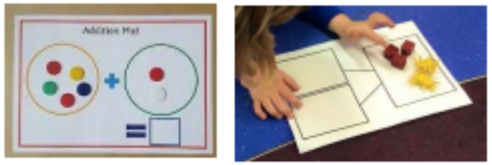
- Children at the expected level of development will:
- Have a deep understanding of number to 10, including the composition of each number;
- Subitise (recognise quantities without counting) up to 5;
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

ELG: Numerical Patterns Children at the expected level of development will:
- Verbally count beyond 20, recognising the pattern of the counting system;
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Concrete	Pictorial	Abstract	Vocabulary
Reception Addition			
Within reception, a variety of concrete, pictorial and abstract resources will be used depending on the focus or unit. The teacher will use their professional judgement to decide which of these would be most appropriate. Concrete, pictorial and abstract resources can be used individually or collectively. Examples of these are below. At The Oaks, we provide opportunities for children to; - Know that a group of things change in quantity when something is added. - Find the total number of items in two groups by counting all of them. - Say the number that is one more than a given number. - Finds one more from a group of up to five objects, then ten objects. - In practical activities and discussion, beginning to use the vocabulary within this document. - Using quantities and objects, they add two single digit numbers and count on to find the answer. - Solve problems including doubling.			

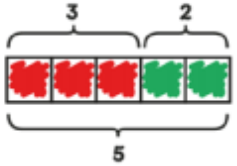
Use toys and general classroom resources for children to physically manipulate, group/regroup.

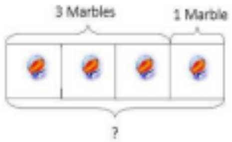
Use specific maths resources such as counters, snap cubes, Numicon etc.



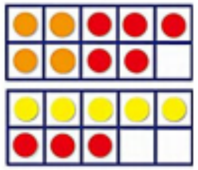
Use visual supports such as ten frames, part part whole and addition mats, with the physical objects and resources that can be manipulated.

Two groups of pictures so children are able to count the total.

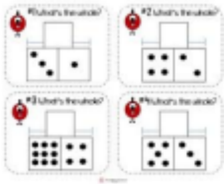


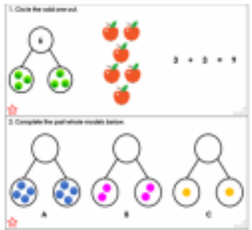


Bar model using visuals, pictures/icons or colours.



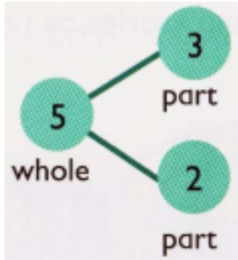
Use visual supports such as ten frames, part part whole and addition mats with pictures/icons.

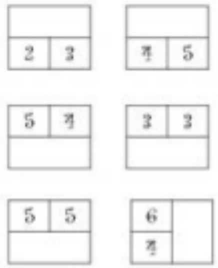




A focus on symbols and numbers to form a calculation.

$$5+2=7$$



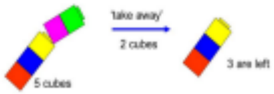


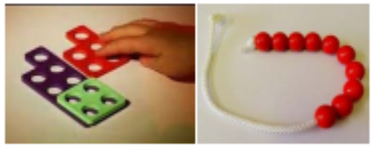
* No expectation for children to be able to record a number sentence/addition calculation.

Reception Subtraction

At The Oaks, we provide opportunities for children to
- Knows that a group of things change in quantity when something is taken away
- Find one less from a group of five objects, then ten objects.
- In practical activities and discussion, beginning to use the vocabulary involved in this document.
- Using quantities and objects, they subtract two single digit numbers and count back to find the answer.

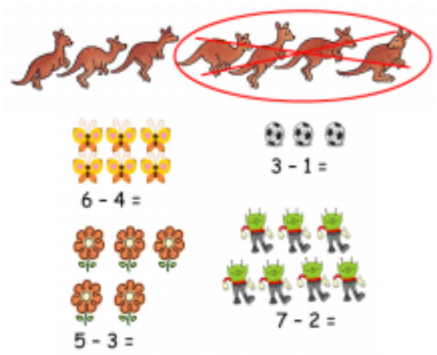
Use toys and general classroom resources for children to physically manipulate, group/regroup.



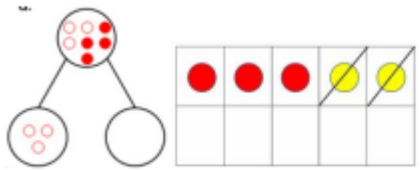


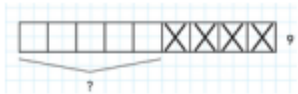
Use specific maths resources such as snap cubes, Numicon, bead strings etc.

Use visual supports such as ten frames, part part whole and subtraction mats, with the physical objects and resources that can be manipulated.



A group of pictures for children to cross out or cover quantities to support subtraction.





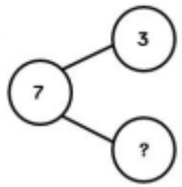
Use visual supports such as ten frames, part part whole and bar model with pictures/icons.

A focus on symbols and numbers to form a calculation.

$10 - 6 = 4$

3	?
7	

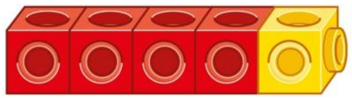
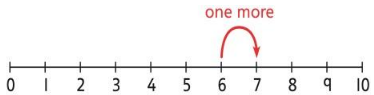
$7 - 3 = ?$



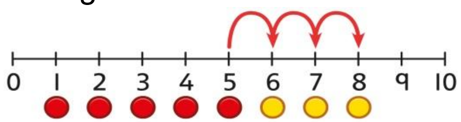
* No expectation for children to be able to record a number sentence/addition calculation.

Year One Addition and Subtraction
National Curriculum Objectives

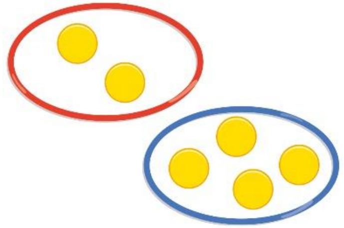
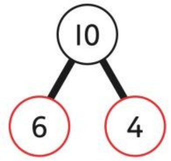
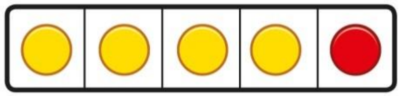
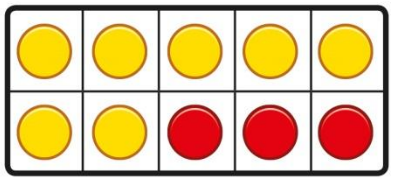
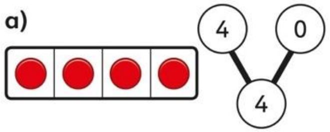
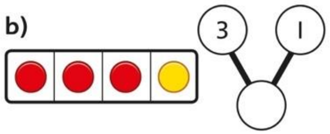
- read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20, including 0
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? − 9

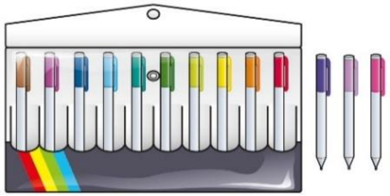
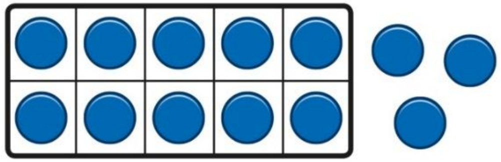
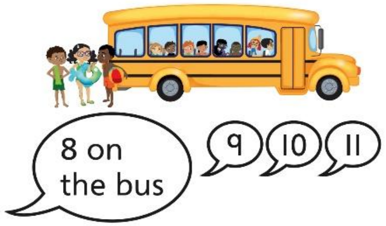
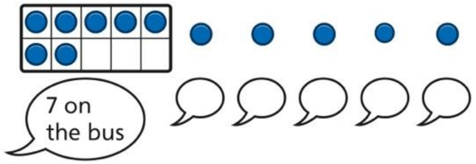
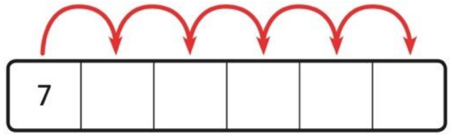
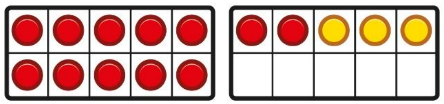
<table>
<tr><th></th><th>Concrete</th><th>Pictorial</th><th>Abstract</th><th>Vocabulary</th></tr>
<tr><td></td>
<td>Counting and adding more
Children add one more person or object to a group to find one more.</td>
<td>Counting and adding more
Children add one more cube or counter to a group to represent one more.

One more than 4 is 5.</td>
<td>Counting and adding more
Use a number line to understand how to link counting on with finding one more.


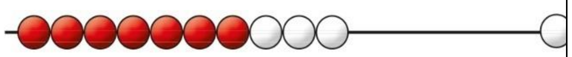
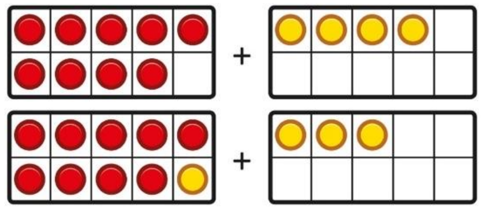
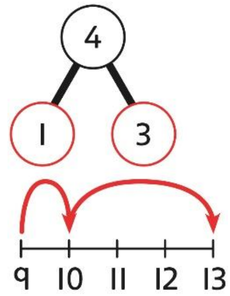
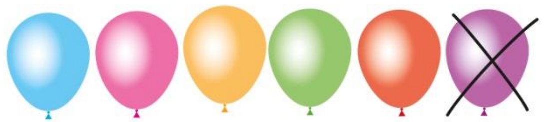
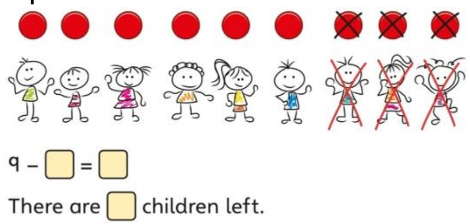
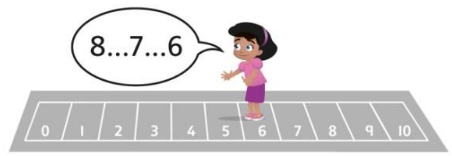
One more than 6 is 7.
7 is one more than 6.

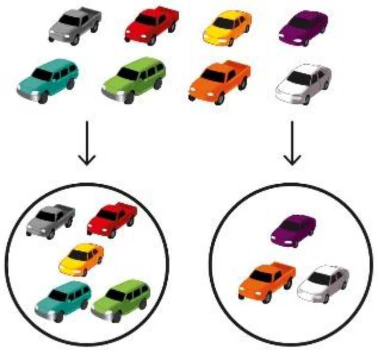
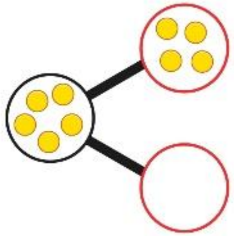
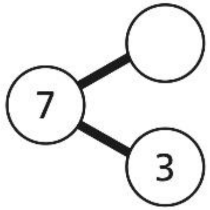
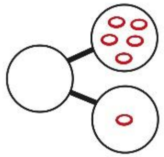
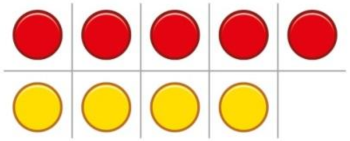
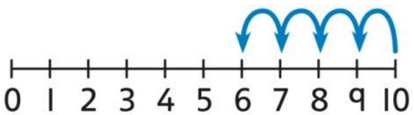
Learn to link counting on with adding more than one.


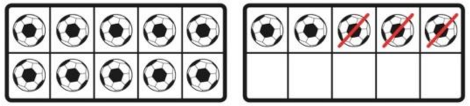
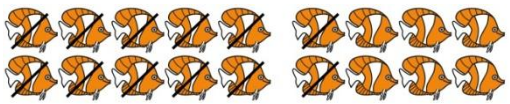
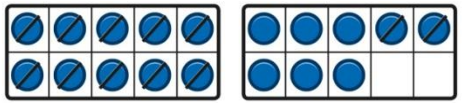
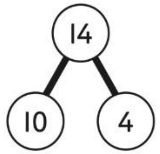
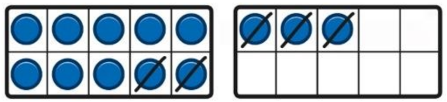
5 + 3 = 8</td>
<td>more
count
add
addition
cube
represent
number line
link</td></tr>
<tr><td></td>
<td>Understanding part-part-whole relationship
Sort people and objects into parts and understand the relationship with the whole.</td>
<td>Understanding part-part-whole relationship
Children draw to represent the parts and understand the relationship with the whole.</td>
<td>Understanding part-part-whole relationship
Use a part-whole model to represent the numbers.</td>
<td>part whole model
represent
number
amount
part</td></tr>
</table>

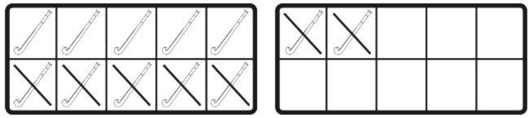
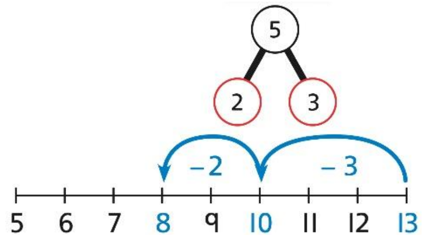
	 *The parts are 2 and 4. The whole is 6.*	 *The parts are 1 and 5. The whole is 6.*	 $\boxed{6} + \boxed{4} = \boxed{10}$ *6 + 4 = 10*	whole relationship same different more less
	Knowing and finding number bonds within 10 Break apart a group and put back together to find and form number bonds.  *3 + 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*	number bond represent part whole zero example same different include cube five/ten frame equal equivalent equation
	Understanding teen numbers as a complete 10 and some more Complete a group of 10 objects and count 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.	**Understanding teen numbers as a complete 10 and some more.** *1 ten and 3 ones equal 13.* *10 + 3 = 13*	teen number more than 10 tens ones tens frame represent

	 *13 is 10 and 3 more.*	 *13 is 10 and 3 more.*		more less equal equivalent complete additional add
	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 = □	count on number line strategy twenty more less represent representation equal equivalent
	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*	teen number within 10 more than 10 represent representation recognise equal equivalent addition more less
	Bridging the 10 using number bonds Children use a bead string to complete a 10 and understand how this relates to the addition.	**Bridging the 10 using number bonds** Children use counters to complete a ten frame and understand how	**Bridging the 10 using number bonds** Use a part-whole model and a number line to support the calculation.	bridge ten frame more less makes

	 *7 add 3 makes 10.* *So, 7 add 5 is 10 and 2 more.*	they can add using knowledge of number bonds to 10.  .	 *9 + 4 = 13*	equal equivalent number bonds part whole model calculation sum equation
Year One Subtraction				
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.  	**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*	counting back counting forward left remove arrange number line number track represent object problem equal commutative
	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.	**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.	**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.	whole part missing part add subtract take away find equal equivalent

	 *8 − 5 = ?*	 $\boxed{5} - \boxed{4} = \boxed{}$	 *7 − 3 = ?* Children develop an understanding of the relationship between addition and subtraction facts in a part-whole model.  $\square + \square = \square$ $\square + \square = \square$ $\square - \square = \square$ $\square - \square = \square$	
	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.*	**Finding the difference** Children understand 'find the difference' as subtraction.  *10 − 4 = 6* *The difference between 10 and 6 is 4.*	find the difference counters subtraction number line jumps move backwards count backwards more less draw sketch counters

	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*	bead string number bonds subtract count backwards quicker slower more less equal number line tens frame
	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*	part whole calculate equal equivalent method strategy equation commutative number family take away remove partition
	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.	**Subtraction bridging 10 using number bonds** Represent the use of bonds using ten frames. 	**Subtraction bridging 10 using number bonds** Use a number line and a part-whole model to support the method. *13 − 5*	number bonds tens frame represent part whole model strategy split partition

	 *7 is 2 and 5, so I take away the 2 and then the 5.*	*For 13 – 5, I take away 3 to make 10, then take away 2 to make 8.*		method

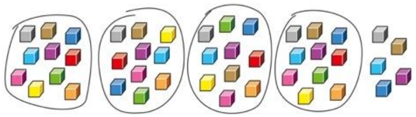
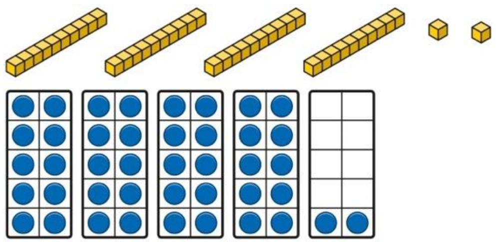
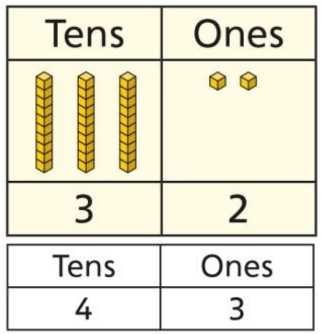
Government Guidance Ready to Progress criteria
1AS–1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.
1AS–2 Read, write and interpret equations containing addition (+), subtraction (−) and equals (=) symbols, and relate additive expressions and equations to real-life contexts. and =

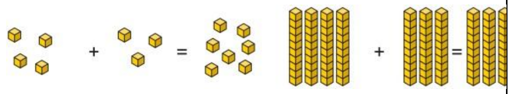
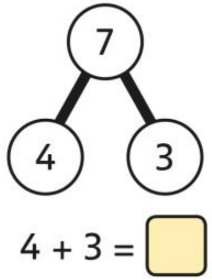
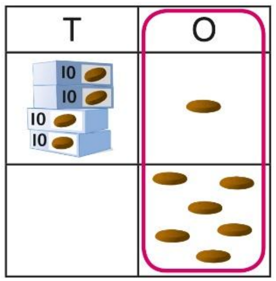
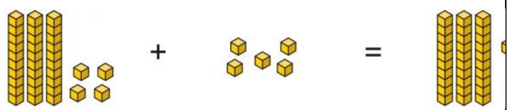
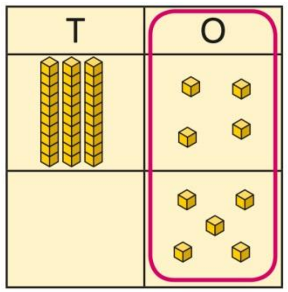
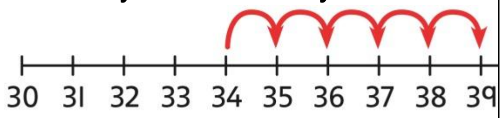
Year 2

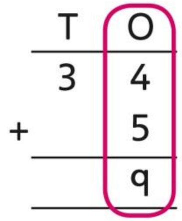
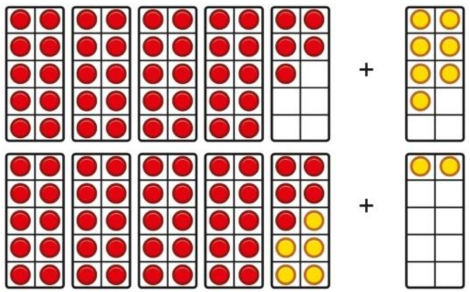
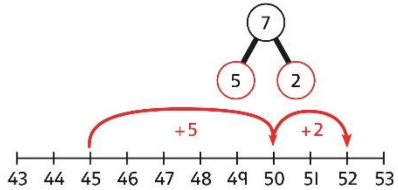
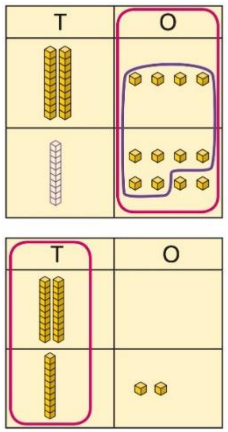
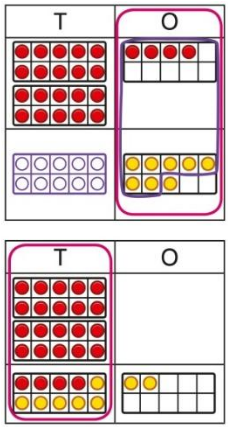
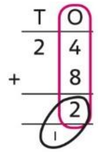
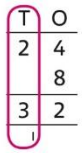
Year 2 Addition

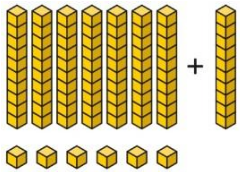
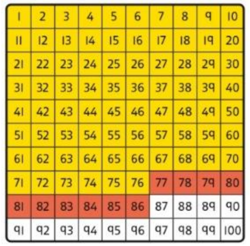
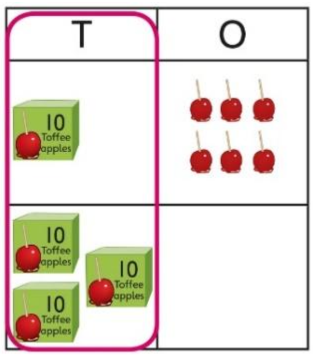
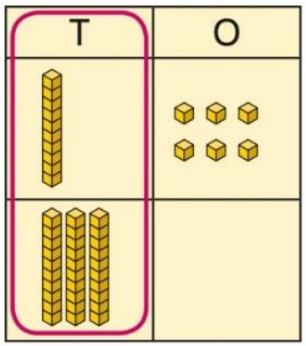
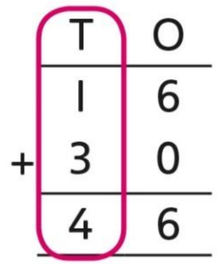
- solve problems with addition and subtraction:
    - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
    - applying their increasing knowledge of mental and written methods
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
    - a two-digit number and 1s
    - a two-digit number and 10s
    - 2 two-digit numbers
    - adding 3 one-digit numbers
- show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot

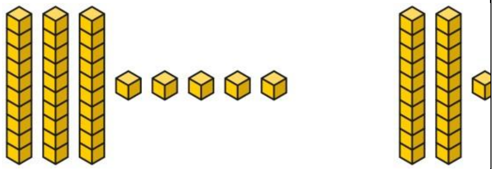
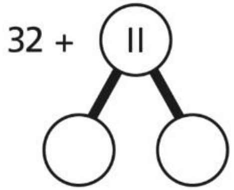
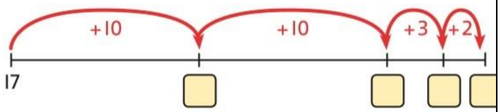
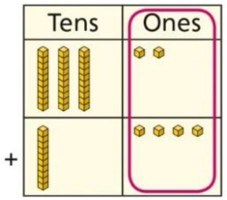
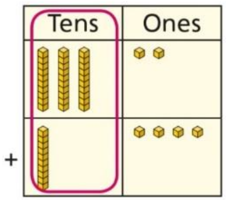
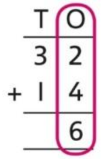
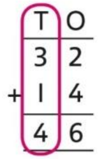
recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

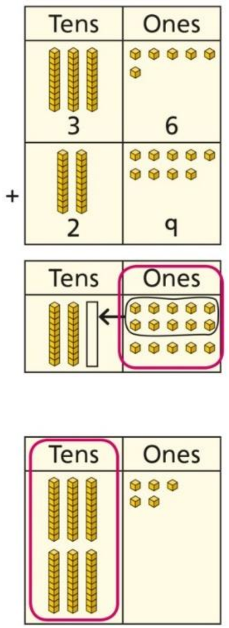
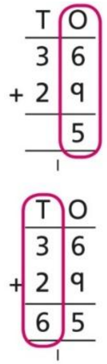
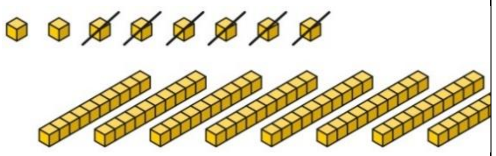
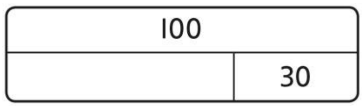
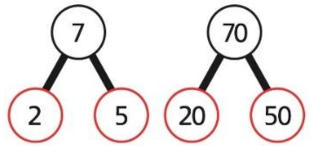
	Concrete	**Pictorial**	**Abstract**	**Vocabulary**
Understanding 10s and 1s	Group objects into 10s and 1s.  Bundle straws to understand unitising of 10s. 	Understand 10s and 1s equipment, and link with visual representations on ten frames. 	Represent numbers on a place value grid, using equipment or numerals. 	*place value* *less than* *greater than* *digit* *difference* *even* *odd* *sum* *equation*
Adding 10s	Use known bonds and unitising to add 10s.	Use known bonds and unitising to add 10s.	Use known bonds and unitising to add 10s.	

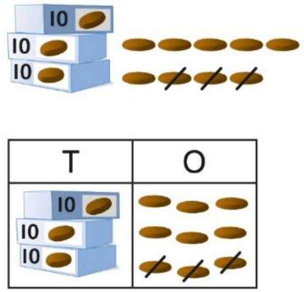
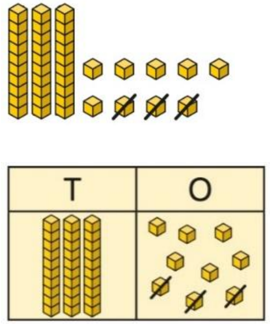
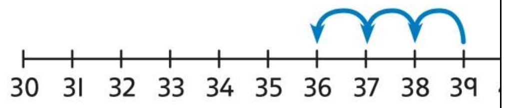
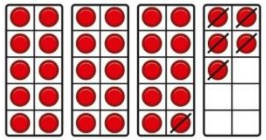
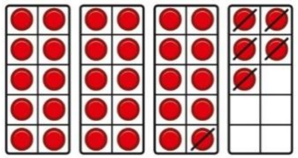
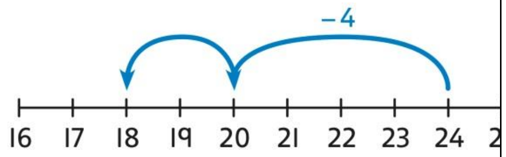
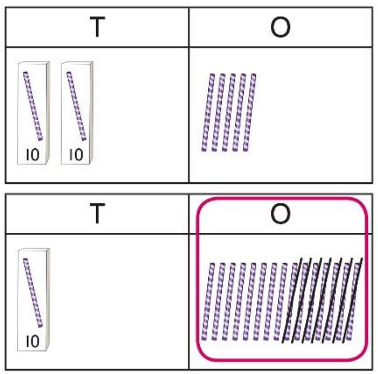
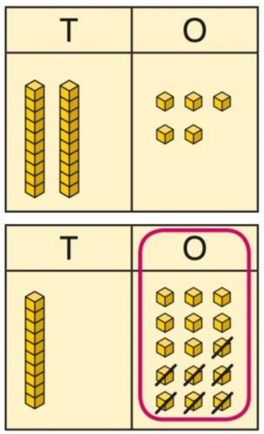
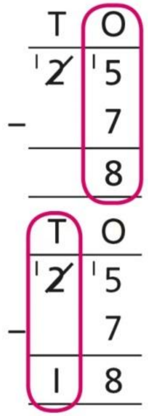
	 *I know that 4 + 3 = 7.* *So, I know that 4 tens add 3 tens is 7 tens.*	 *I know that 4 + 3 = 7.* *So, I know that 4 tens add 3 tens is 7 tens.*	 *4 + 3 = 7* *4 tens + 3 tens = 7 tens* *40 + 30 = 70*	
Adding a 1-digit number to a 2-digit number not bridging a 10	Add the 1s to find the total. Use known bonds within 10.  *41 is 4 tens and 1 one.* *41 add 6 ones is 4 tens and 7 ones.* 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.* 	Add the 1s. 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.  This can be represented horizontally or vertically. *34 + 5 = 39* *or*	

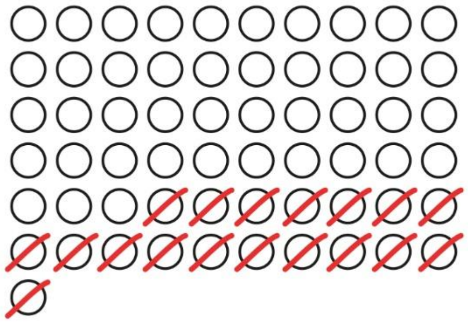
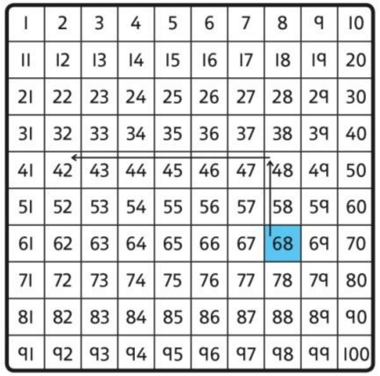
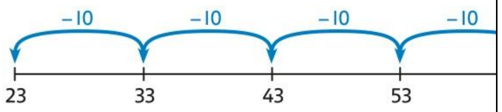
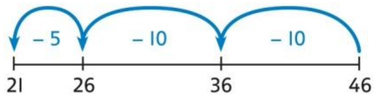
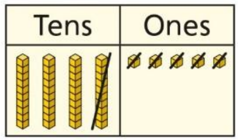
				
Adding a 1-digit number to a 2-digit number bridging 10	Complete a 10 using number bonds.  *There are 4 tens and 5 ones. I need to add 7. I will use 5 to complete a 10, then add 2 more.*	Complete a 10 using number bonds. 	Complete a 10 using number bonds.  *7 = 5 + 2* *45 + 5 + 2 = 52*	
Adding a 1-digit number to a 2-digit number using exchange	Exchange 10 ones for 1 ten. 	Exchange 10 ones for 1 ten. 	Exchange 10 ones for 1 ten.  	
Adding a multiple of 10 to a 2-	Add the 10s and then recombine.	Add the 10s and then recombine.	Add the 10s and then recombine. *37 + 20 = ?*	

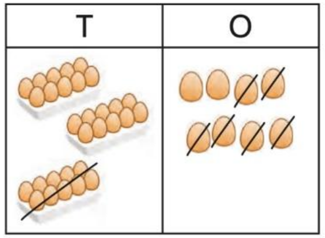
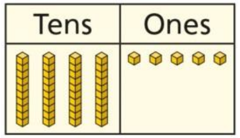
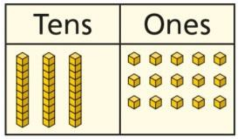
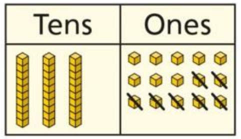
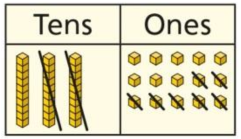
digit number	 *27 is 2 tens and 7 ones.* *50 is 5 tens.* *There are 7 tens in total and 7 ones.* *So, 27 + 50 is 7 tens and 7 ones.*	 *66 is 6 tens and 6 ones.* *66 + 10 = 76* A 100 square can support this understanding. 	*30 + 20 = 50* *50 + 7 = 57* *37 + 20 = 57*	
Adding a multiple of 10 to a 2-digit number using columns	Add the 10s using a place value grid to support.  *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.  *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.  *1 + 3 = 4* *1 ten + 3 tens = 4 tens* *16 + 30 = 46*	multiple

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-digit 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	Add the 1s. Exchange 10 ones for a ten. Then add the 10s.		Add the 1s. Exchange 10 ones for a ten. Then add the 10s.	

with exchange	 		 	
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 1 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	
Subtracting a 2-digit number	Subtract by taking away.  *61 − 18* *I took away 1 ten and 8 ones.*	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.  *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.	Subtract the 1s. Then subtract the 10s.  	Using column subtraction, subtract the 1s. Then subtract the 10s.	

	 *38 − 16 = 22*		T O 4 5 − 1 2 3 T O 4 5 − 1 2 3 3	
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. T O 4 5 − 2 7 T O $^{3}\cancel{4}$ $^{1}5$ − 2 7 T O $^{3}\cancel{4}$ $^{1}5$ − 2 7 8 T O $^{3}\cancel{4}$ $^{1}5$ − 2 7 1 8	

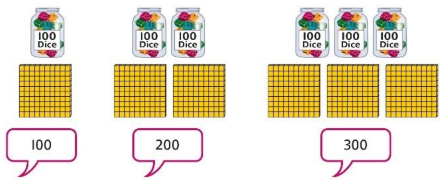
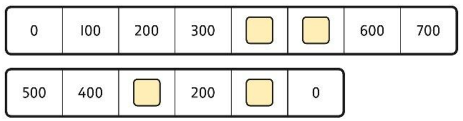
Government Guidance Ready to Progress criteria
2AS–1 Add and subtract across 10.
2AS–2 Recognise the subtraction structure of ‘difference’ and answer questions of the form, “How many more…?”

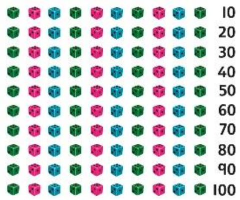
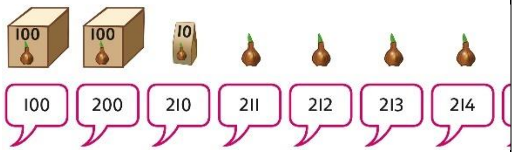
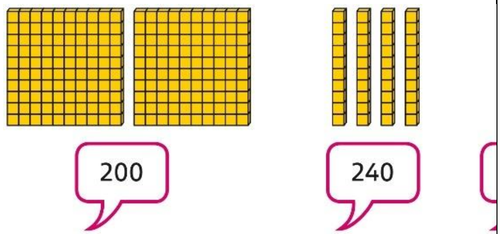
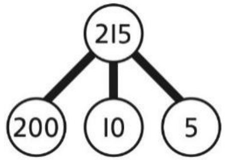
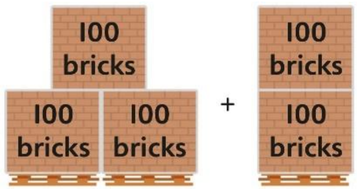
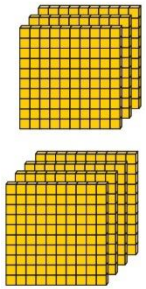
2AS–3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two digit number.
2AS–4 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two digit numbers.

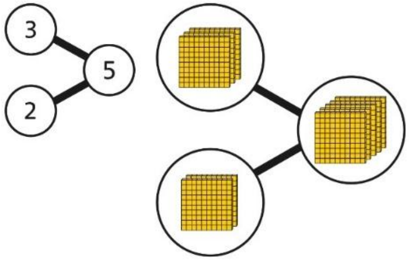
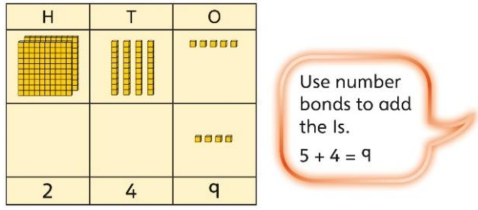
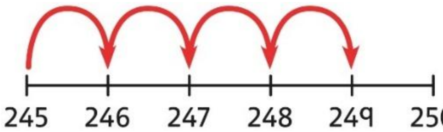
Year 3

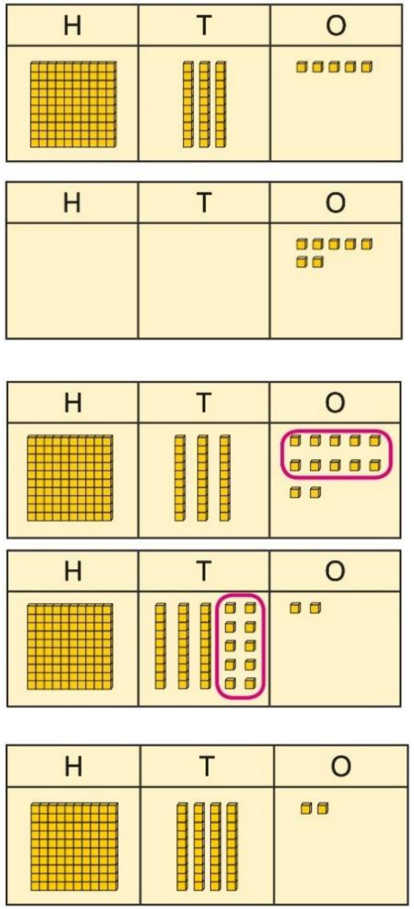
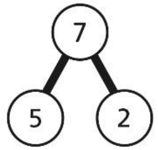
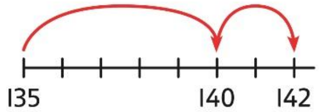
Year Three Addition and Subtraction
National Curriculum Objects

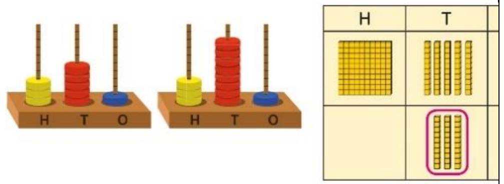
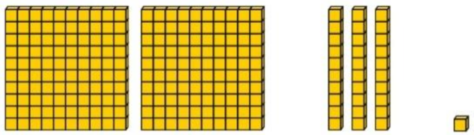
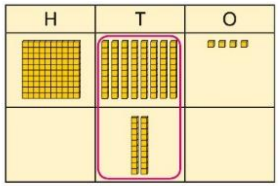
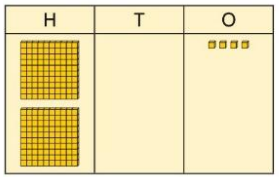
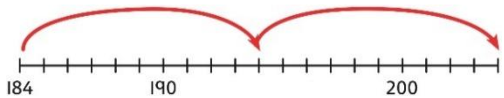
- add and subtract numbers mentally, including:
  - a three-digit number and 1s
  - a three-digit number and 10s
  - a three-digit number and 100s
- add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

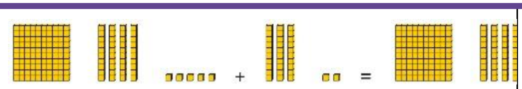
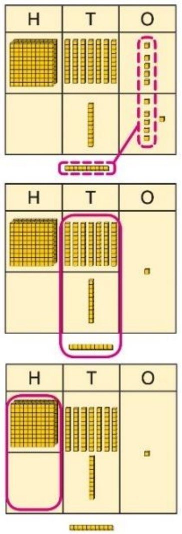
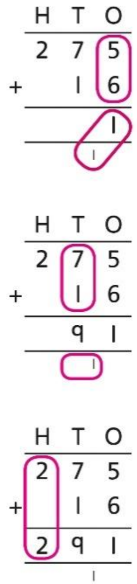
	Concrete	Pictorial	Abstract	Vocabulary Further Questioning
Understanding 100s	Understand the cardinality of 100, and the link with 10 tens. Use cubes to place into groups of 10 tens.	Unitise 100 and count in steps of 100. 	Represent steps of 100 on a number line and a number track and count up to 1,000 and back to 0. 	Add Total Sum Altogether Difference Mentally Orally Estimate Inverse Operation

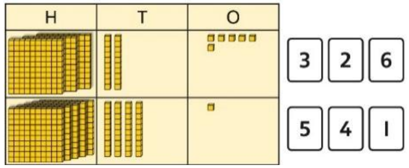
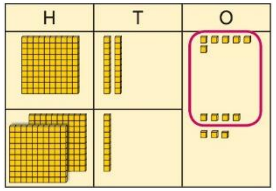
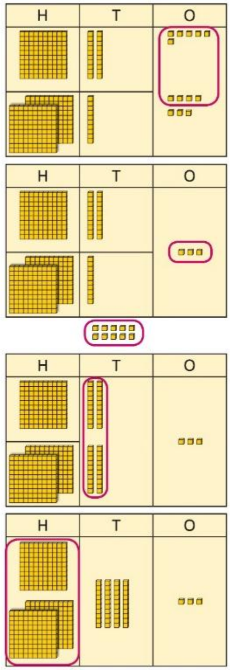
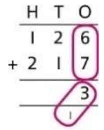
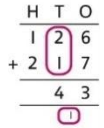
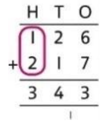
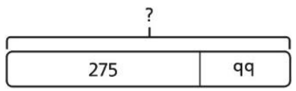
				Place Value Complex
Understanding place value to 1,000	Unitise 100s, 10s and 1s to build 3-digit numbers. 	Use equipment to represent numbers to 1,000.  Use a place value grid to support the structure of numbers to 1,000. Place value counters are used alongside other equipment. Children should understand how each counter represents a different unitised amount.	Represent the parts of numbers to 1,000 using a part-whole model.  *215 = 200 + 10 + 5* Recognise numbers to 1,000 represented on a number line, including those between intervals.	place value part part whole denes
Adding 100s	Use known facts and unitising to add multiples of 100.  *3 + 2 = 5* *3 hundreds + 2 hundreds = 5 hundreds*	Use known facts and unitising to add multiples of 100. 	Use known facts and unitising to add multiples of 100. Represent the addition on a number line. Use a part-whole model to support unitising.	addition bridging place value exchange bar model group representation represent total

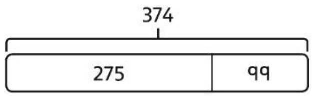
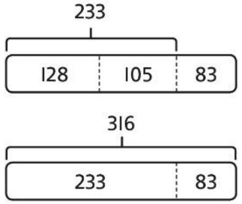
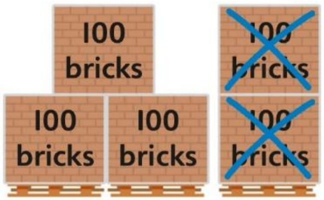
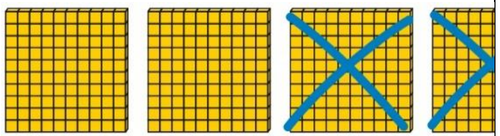
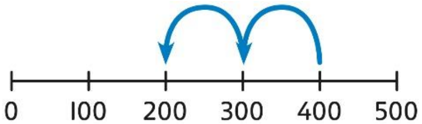
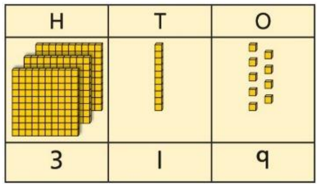
	300 + 200 = 500	*3 + 4 = 7* *3 hundreds + 4 hundreds = 7 hundreds* *300 + 400 = 700*	 *3 + 2 = 5* *300 + 200 = 500*	
3-digit number + 1s, no exchange or bridging	Use number bonds to add the 1s.  *214 + 4 = ?* *Now there are 4 + 4 ones in total.* *4 + 4 = 8* *214 + 4 = 218*	Use number bonds to add the 1s.  *245 + 4* *5 + 4 = 9* *245 + 4 = 249*	Understand the link with counting on. *245 + 4*  Use number bonds to add the 1s and understand that this is more efficient and less prone to error. *245 + 4 = ?* *I will add the 1s.* *5 + 4 = 9* *So, 245 + 4 = 249*	calculation unit addition number line represent representation
3-digit number + 1s 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.	Understand how to bridge by partitioning to the 1s to make the next 10.	exchange bridging total column method row

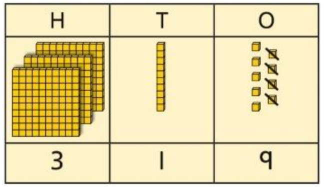
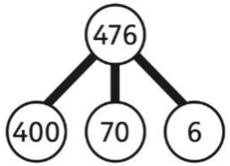
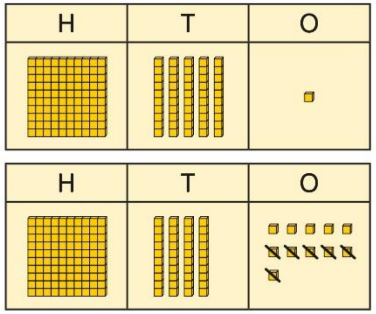
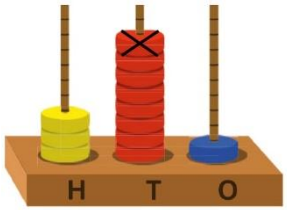
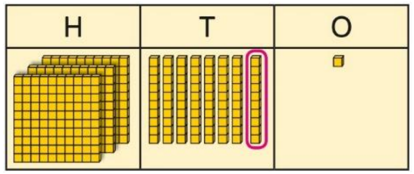
		 *135 + 7 = 142*	  *135 + 7 = ?* *135 + 5 + 2 = 142* Ensure that children understand how to add 1s bridging a 100. *198 + 5 = ?* *198 + 2 + 3 = 203*	
3-digit number + 10s, no exchange	Calculate mentally by forming the number bond for the 10s.	Calculate mentally by forming the number bond for the 10s. *351 + 30 = ?*	Calculate mentally by forming the number bond for the 10s. *753 + 40* *I know that 5 + 4 = 9* *So, 50 + 40 = 90*	total column method row

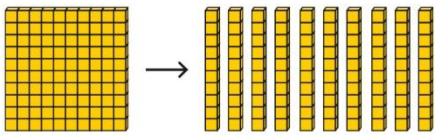
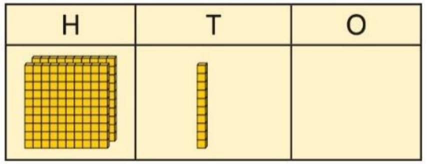
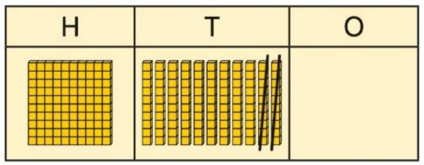
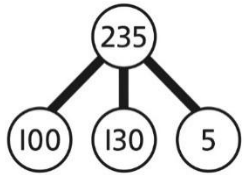
	 *234 + 50* *There are 3 tens and 5 tens altogether.* *3 + 5 = 8* *In total there are 8 tens.* *234 + 50 = 284*	 *5 tens + 3 tens = 8 tens* *351 + 30 = 381*	*753 + 40 = 793*	
3-digit number + 10s, with exchange	Understand the exchange of 10 tens for 1 hundred. 	Add by exchanging 10 tens for 1 hundred. *184 + 20 = ?*   *184 + 20 = 204*	Understand how the addition relates to counting on in 10s across 100.  *184 + 20 = ?* *I can count in 10s … 194 … 204* *184 + 20 = 204* Use number bonds within 20 to support efficient mental calculations. *385 + 50* *There are 8 tens and 5 tens.* *That is 13 tens.* *385 + 50 = 300 + 130 + 5* *385 + 50 = 435*	exchange bridging total column method row
3-digit number + 2-digit number	Use place value equipment to make and combine groups to model addition.	Use a place value grid to organise thinking and adding of 1s, then 10s.	Use the vertical column method to represent the addition. Children must understand how this relates to place value at each stage of the calculation.	place value grid partition order/organise column

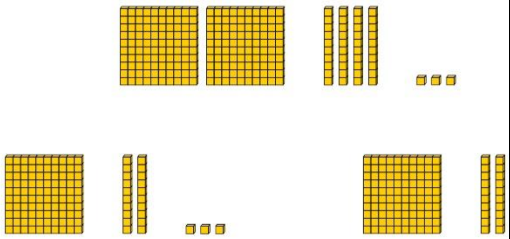
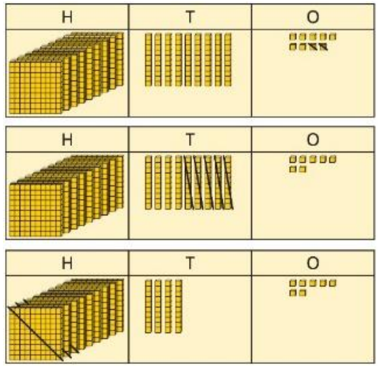
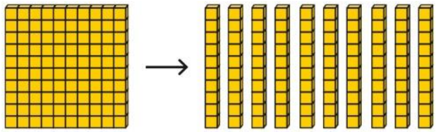
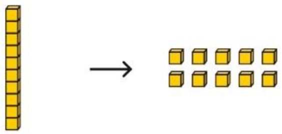
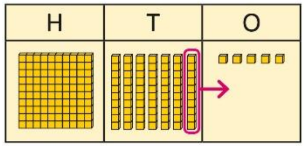
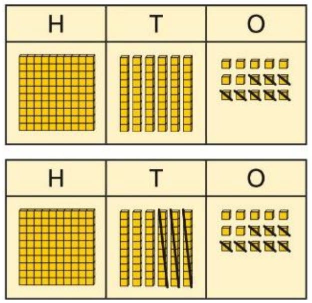
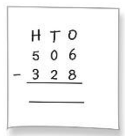
				
3-digit number + 2-digit number, exchange required	Use place value equipment to model addition and understand where exchange is required. *Use place value counters to represent 154 + 72.* *Use this to decide if any exchange is required.* *There are 5 tens and 7 tens. That is 12 tens so I will exchange.*	Represent the required exchange on a place value grid using equipment. *275 + 16 = ?*  *275 + 16 = 291* Note: In this example, a mental method may be more efficient. The numbers for the example calculation have been chosen to allow children to visualise the concept and see how the method relates to place value. Children should be encouraged at every stage to select methods that are accurate and efficient.	Use a column method with exchange. Children must understand how the method relates to place value at each stage of the calculation.  *275 + 16 = 291*	exchange place value bridging total column method row Hundreds, Tens Ones Order Identify Represent Estimate Numerals
3-digit number + 3-digit number, no exchange	Use place value equipment to make a representation of a calculation. This may or may not be structured in a place value grid.	Represent the place value grid with 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.	column place value exchange hundreds tens

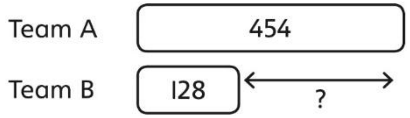
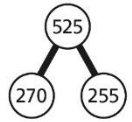
	326 + 541 is represented as: 			ones represent
3-digit number + 3-digit number, exchange required	Use place value equipment to enact the exchange required.  *There are 13 ones.* *I will exchange 10 ones for 1 ten.*	Model the stages of column addition using place value equipment on a place value grid. 	Use column addition, ensuring understanding of place value at every stage of the calculation.    *126 + 217 = 343* Note: Children should also study examples where exchange is required in more than one column, for example *185 + 318 = ?*	
Representing addition problems, and selecting appropriate methods	Encourage children to use their own drawings and choices of place value equipment to represent problems with one or more steps. These representations will help them to select appropriate methods.	Children understand and create bar models to represent addition problems. *275 + 99 = ?*	Use representations to support choices of appropriate methods. 	bar model partition complex partition addition altogether sum of total

		 *275 + 99 = 374*	*I will add 100, then subtract 1 to find the solution.* *128 + 105 + 83 = ?* *I need to add three numbers.* 128 + 105 = 233 	
Year 3 Subtraction				
Subtracting 100s	Use known facts and unitising to subtract multiples of 100.  *5 − 2 = 3* *500 − 200 = 300*	Use known facts and unitising to subtract multiples of 100.  *4 − 2 = 2* *400 − 200 = 200*	Understand the link with counting back in 100s.  *400 − 200 = 200* Use known facts and unitising as efficient and accurate methods. *I know that 7 − 4 = 3. Therefore, I know that 700 − 400 = 300.*	place value digit subtract total equal calculation unit
3-digit number – 1s, no exchange	Use number bonds to subtract the 1s. 	Use number bonds to subtract the 1s. 	Understand the link with counting back using a number line. Use known number bonds to calculate mentally. *476 − 4 = ?*	part-part whole partition place value digit subtract total equal calculation

	214 − 3 = ?  *4 − 3 = 1* *214 − 3 = 211*	*319 − 4 = ?*  *9 − 4 = 5* *319 − 4 = 315*	 *6 − 4 = 2* *476 − 4 = 472*	unit
3-digit number – 1s, exchange or bridging required	Understand why an exchange is necessary by exploring why 1 ten must be exchanged. Use place value equipment.	Represent the required exchange on a place value grid. *151 − 6 = ?*  	Calculate mentally by using known bonds. *151 − 6 = ?* *151 − 1 − 5 = 145*	bridging exchanging column place value
3-digit number – 10s, no exchange	Subtract the 10s using known bonds.  	Subtract the 10s using known bonds.  	Use known bonds to subtract the 10s mentally. *372 − 50 = ?* *70 − 50 = 20*	

	381 − 10 = ? *8 tens with 1 removed is 7 tens.* *381 − 10 = 371*	*8 tens − 1 ten = 7 tens* *381 − 10 = 371*	*So, 372 − 50 = 322*	
3-digit number − 10s, exchange or bridging required	Use equipment to understand the exchange of 1 hundred for 10 tens. 	Represent the exchange on a place value grid using equipment. *210 − 20 = ?*  *I need to exchange 1 hundred for 10 tens, to help subtract 2 tens.*  *210 − 20 = 190*	Understand the link with counting back on a number line. Use flexible partitioning to support the calculation. *235 − 60 = ?*  *235 = 100 + 130 + 5* *235 − 60 = 100 + 70 + 5* *= 175*	
3-digit number − up to 3-digit number	Use place value equipment to explore the effect of splitting a whole into two parts, and understand the link with taking away.	Represent the calculation on a place value grid.	Use column subtraction to calculate accurately and efficiently.	exchange subtract subtraction bridging place holder column row total

			H T O 9 9 9 − 3 5 2 7 H T O 9 9 9 − 3 5 2 4 7 H T O 9 9 9 − 3 5 2 6 4 7	
3-digit number – up to 3-digit number, exchange required	Use equipment to enact the exchange of 1 hundred for 10 tens, and 1 ten for 10 ones.  	*Model the required exchange on a place value grid.* *175 − 38 = ?* *I need to subtract 8 ones, so I will exchange a ten for 10 ones.*  	Use column subtraction to work accurately and efficiently. H T O 1 $^{6}\cancel{7}$ $^{1}5$ − 3 8 1 3 7 175 – 38 = 137 If the subtraction is a 3-digit number subtract a 2-digit number, children should understand how the recording relates to the place value, and so how to line up the digits correctly. Children should also understand how to exchange in calculations where there is a zero in the 10s column. 	
Representing subtraction problems		Use bar models to represent subtractions. ‘Find the difference’ is represented as two bars for comparison.	Children use alternative representations to check calculations and choose efficient methods. Children use inverse operations to check additions and subtractions.	round rounding estimate estimating represent bar model

		 Bar models can also be used to show that a part must be taken away from the whole.	The part-whole model supports understanding. *I have completed this subtraction.* *525 − 270 = 255* *I will check using addition.*  H T O 2 7 0 + 2 5 5 5 2 5	inverse operation approximate

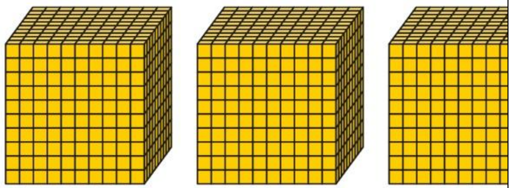
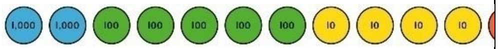
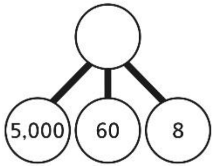
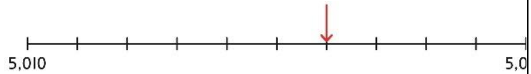
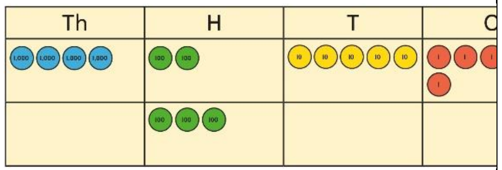
Government Guidance Ready to Progress criteria
3AS–1 Calculate complements to 100.
3AS–2 Add and subtract up to three-digit numbers using columnar methods.
3AS–3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part–part–whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.

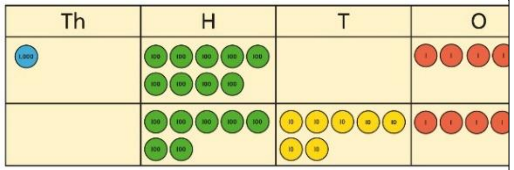
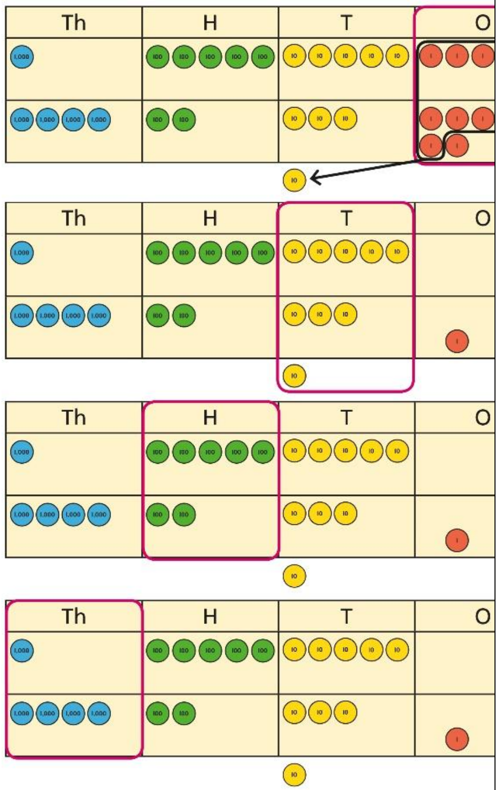
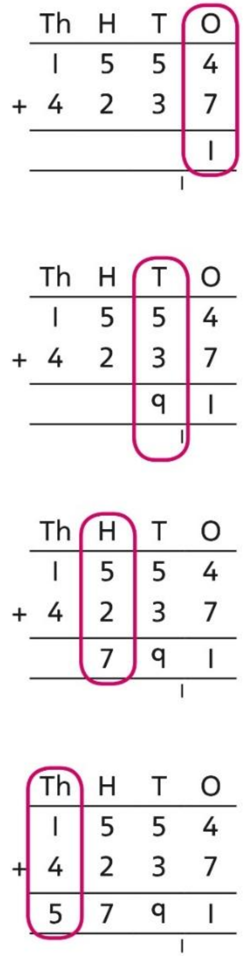
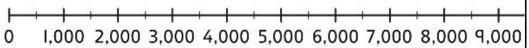
Year 4

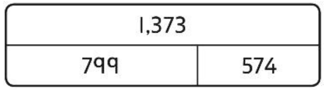
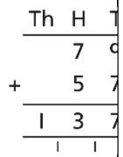
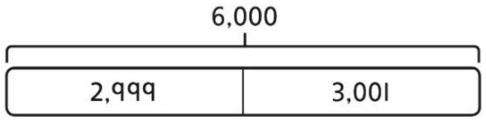
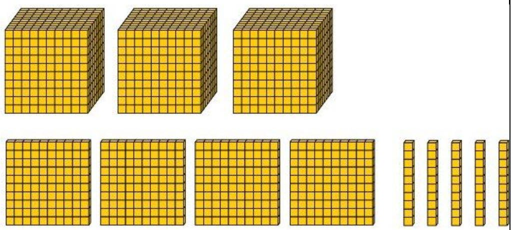
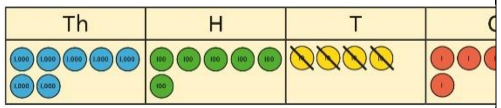
Year Four Addition and Subtraction
National Curriculum Objects

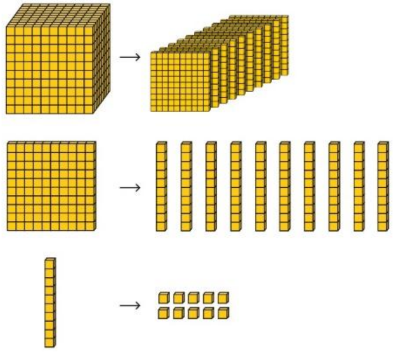
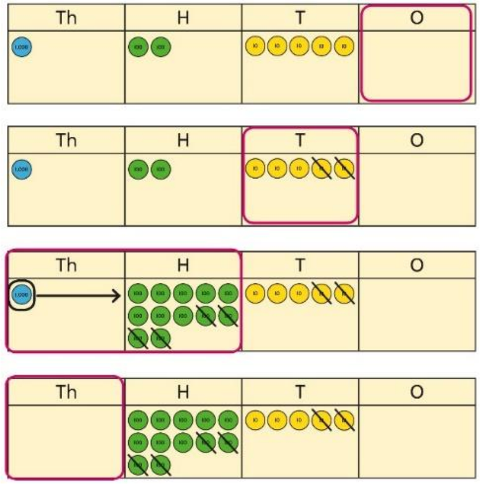
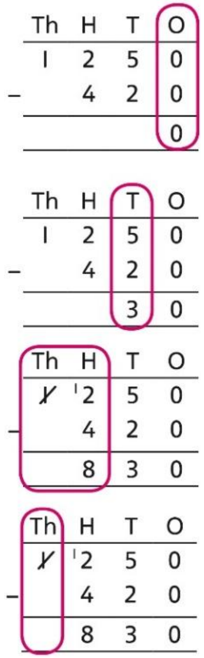
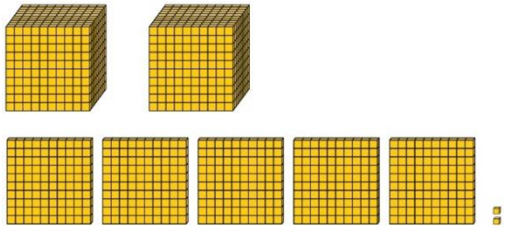
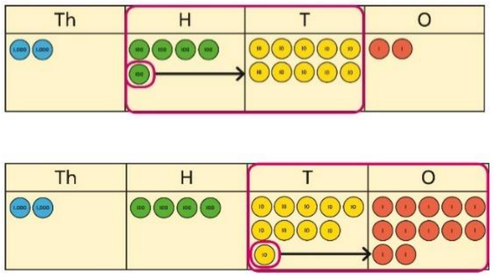
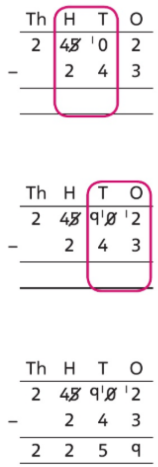
- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.
- estimate and use inverse operations to check answers to a calculation .
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

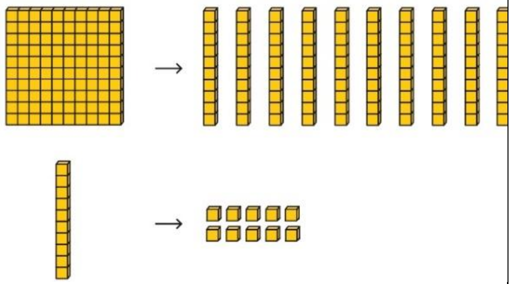
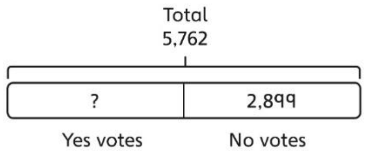
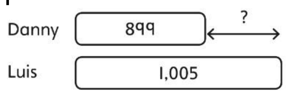
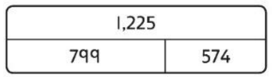
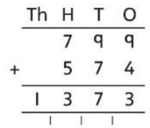
	Concrete	**Pictorial**	**Abstract**	**Vocabulary** **Further Questioning**
Understanding	Use place value equipment to understand the place value of 4-digit numbers.	Represent numbers using place value counters once children	Understand partitioning of 4-digit numbers, including numbers with digits of 0.	place value digit difference

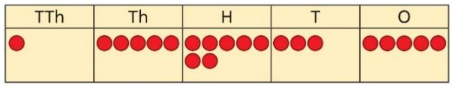
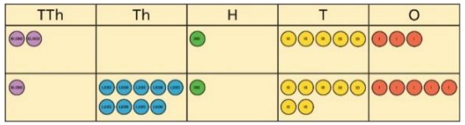
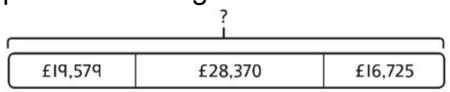
numbers to 10,000	 *4 thousands equal 4,000.* *1 thousand is 10 hundreds.*	understand the relationship between 1,000s and 100s.  *2,000 + 500 + 40 + 2 = 2,542*	 *5,000 + 60 + 8 = 5,068* Understand and read 4-digit numbers on a number line. 	even odd sum equal equation bases ten/ dienes
Choosing mental methods where appropriat e	Use unitising and known facts to support mental calculations. *Make 1,405 from place value equipment.* *Add 2,000.* *Now add the 1,000s.* *1 thousand + 2 thousands = 3 thousands* *1,405 + 2,000 = 3,405*	Use unitising and known facts to support mental calculations.  *I can add the 100s mentally.* *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*	calculation unit addition
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 1,905 + 775.*	Use place value equipment to model required exchanges.	Use a column method to add, including exchanges.	exchange bridging total column method row

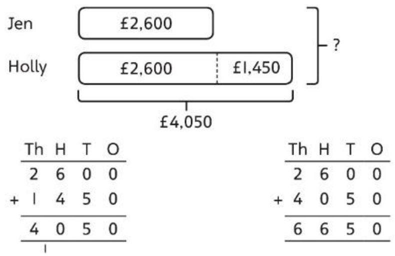
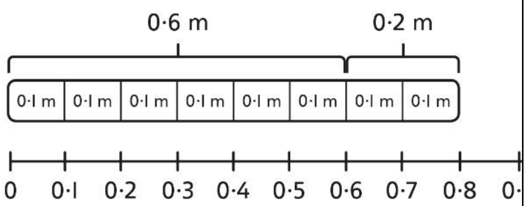
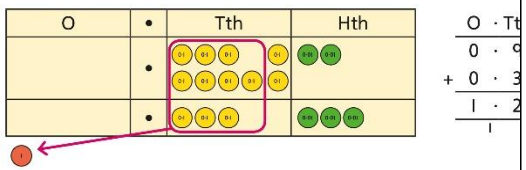
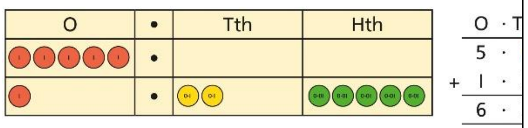
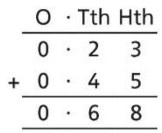
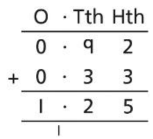
	 *Why have only three columns been used for the second row? Why is the Thousands box empty?* *Which columns will total 10 or more?*	 Include examples that exchange in more than one column.	 Include examples that exchange in more than one column.	
Representing additions and checking strategies		Bar models may be used to represent additions in problem contexts, and to justify mental methods where appropriate.	Use rounding and estimating on a number line to check the reasonableness of an addition.  	round rounding estimate estimating represent bar model inverse operation

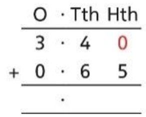
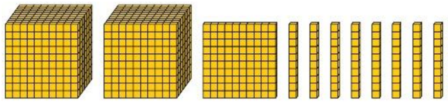
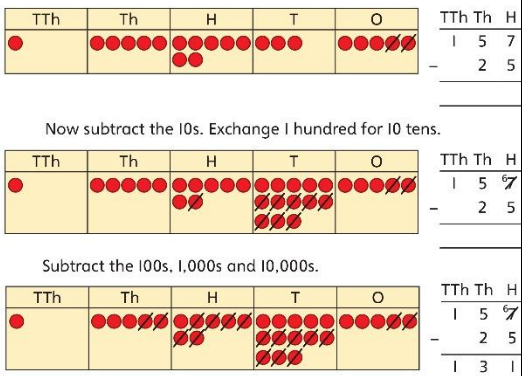
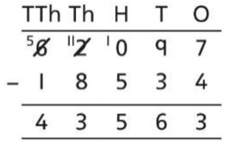
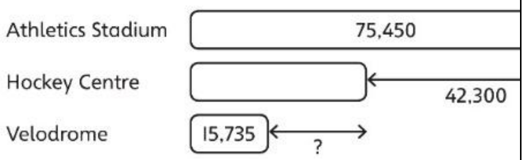
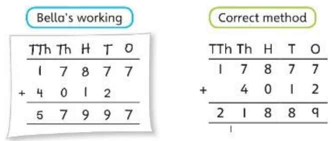
		  *I chose to work out 574 + 800, then subtract 1.*  *This is equivalent to 3,000 + 3,000.*	*912 + 6,149 = ?* *I used rounding to work out that the answer should be approximately 1,000 + 6,000 = 7,000.*	approximate
Year 4 Subtraction				
Choosing mental methods where appropriate	Use place value equipment to justify mental methods.  *What number will be left if we take away 300?*	Use place value grids to support mental methods where appropriate.  *7,646 − 40 = 7,606*	Use knowledge of place value and unitising to subtract mentally where appropriate. *3,501 − 2,000* *3 thousands − 2 thousands = 1 thousand* *3,501 − 2,000 = 1,501*	place value digit subtract total equal calculation unit
Column subtraction with exchange	Understand why exchange of a 1,000 for 100s, a 100 for 10s, or a 10 for 1s may be necessary.	Represent place value equipment on a place value grid to subtract, including exchanges where needed.	Use column subtraction, with understanding of the place value of any exchange required.	place value digit exchange bridging place holder total column

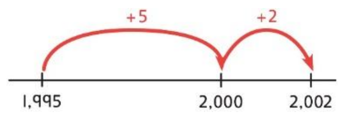
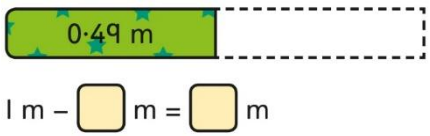
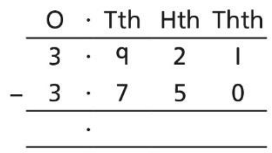
				row
Column subtraction with exchange across more than one column	Understand why two exchanges may be necessary. *2,502 − 243 = ?*  *I need to exchange a 10 for some 1s, but there are not any 10s here.*	Make exchanges across more than one column where there is a zero as a place holder. *2,502 − 243 = ?* 	Make exchanges across more than one column where there is a zero as a place holder. *2,502 − 243 = ?* 	exchange subtract subtraction bridging place holder column row total

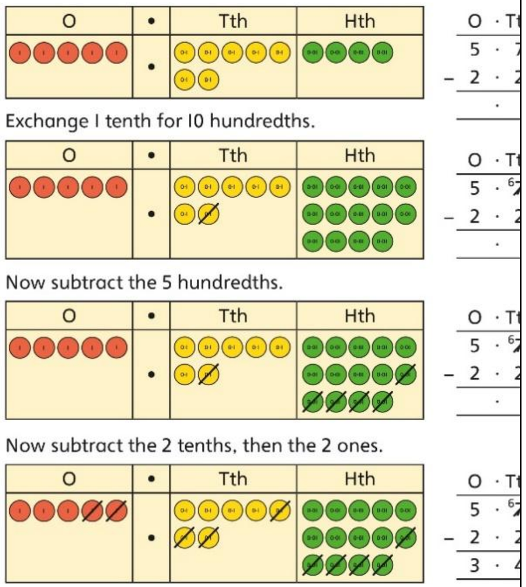
				
Representing subtractions and checking strategies		Use bar models to represent subtractions where a part needs to be calculated.  *I can work out the total number of Yes votes using 5,762 − 2,899.* Bar models can also represent 'find the difference' as a subtraction problem. 	Use inverse operations to check subtractions. *I calculated 1,225 − 799 = 574.* *I will check by adding the parts.*  *The parts do not add to make 1,225. I must have made a mistake.*	bar model subtraction inverse operation represent calculate difference
Government Guidance Ready to Progress criteria Use Y3 Government guidance to inform planning.				

Year 5				
Year Five Addition and Subtraction **National Curriculum Objects** ● add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). ● add and subtract numbers mentally with increasingly large numbers. ● use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy. ● solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.				
	Concrete	**Pictorial**	**Abstract**	**Vocabulary** **Further Questioning**
Column addition with whole numbers	Use place value equipment to represent additions. *Add a row of counters onto the place value grid to show 15,735 + 4,012.* 	Represent additions, using place value equipment on a place value grid alongside written methods.  *I need to exchange 10 tens for a 100.* TTh Th H T O 2 0 1 5 3 + 1 9 1 7 5 3 9 3 2 8 1	Use column addition, including exchanges. TTh Th H T O 1 9 1 7 5 + 1 8 4 1 7 3 7 5 9 2 1 1	addition bridging place value exchange column total
Representing additions		Bar models represent addition of two or more numbers in the context of problem solving. 	Use approximation to check whether answers are reasonable. TTh Th H T O 2 3 4 0 5 + 7 8 9 2 2 0 2 9 7 TTh Th H T 2 3 4 0 + 7 8 9 3 1 2 9 1 1 *I will use 23,000 + 8,000 to check.*	addition bridging place value exchange bar model group representation represent total

				
Adding tenths	Link measure with addition of decimals. *Two lengths of fencing are 0·6 m and* *0·2 m.* *How long are they when added together?* 	Use a bar model with a number line to add tenths.  *0·6 + 0·2 = 0·8* *6 tenths + 2 tenths = 8 tenths*	Understand the link with adding fractions. $\frac{6}{10} + \frac{2}{10} = \frac{8}{10}$ *6 tenths + 2 tenths = 8 tenths* *0·6 + 0·2 = 0·8*	tenths add on combine bar model representation represent decimal place place holder fraction equivalents total
Adding decimals using column addition	Use place value equipment to represent additions. *Show 0·23 + 0·45 using place value counters.*	Use place value equipment on a place value grid to represent additions. Represent exchange where necessary.  Include examples where the numbers of decimal places are different. 	Add using a column method, ensuring that children understand the link with place value.  Include exchange where required, alongside an understanding of place value.  Include additions where the numbers of decimal places are different.	tenths place value column add on combine exchange bridgel decimal place holder fraction equivalents total

			3.4 + 0.65 = ? 	
Year 5 Subtraction				
Column subtraction with whole numbers	Use place value equipment to understand where exchanges are required. *2,250 – 1,070* 	Represent the stages of the calculation using place value equipment on a grid alongside the calculation, including exchanges where required. *15,735 − 2,582 = 13,153* 	Use column subtraction methods with exchange where required.  *62,097 − 18,534 = 43,563*	column bridge exchange compensate representation represent subtract less than fewer place value ditterence
Checking strategies and representin g subtraction s		Bar models represent subtractions in problem contexts, including ‘find the difference’. 	Children can explain the mistake made when the columns have not been ordered correctly.  Use approximation to check calculations.	column bridge exchange compensate representation represent subtract less than fewer place value bar model combine

			I calculated 18,000 + 4,000 mentally to check my subtraction.	addition inverse difference
Choosing efficient methods			To subtract two large numbers that are close, children find the difference by counting on. *2,002 − 1,995 = ?*  Use addition to check subtractions. *I calculated 7,546 − 2,355 = 5,191.* *I will check using the inverse.*	difference total addition subtraction inverse counting on bridging compensation number bonds calculation representation represent
Subtracting decimals	Explore complements to a whole number by working in the context of length.  *1 − 0·49 = ?*	Use a place value grid to represent the stages of column subtraction, including exchanges where required. *5·74 − 2·25 = ?*	Use column subtraction, with an understanding of place value, including subtracting numbers with different numbers of decimal places. *3·921 − 3·75 = ?* 	subtract decimals place value place holder columns bridging exchange tenths hundredths thousandths bar model

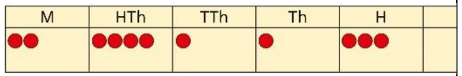
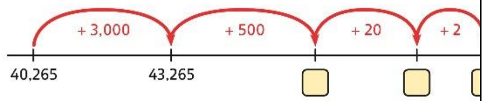
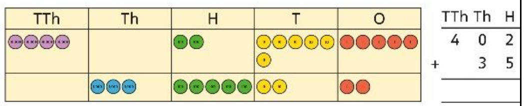
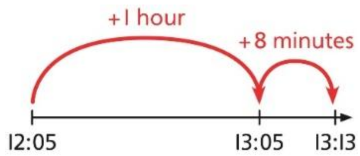
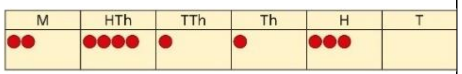
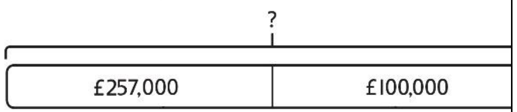
				

Government Guidance Ready to Progress criteria
Use Y3 Government guidance to inform planning.

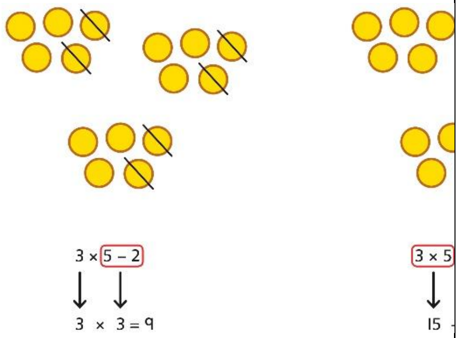
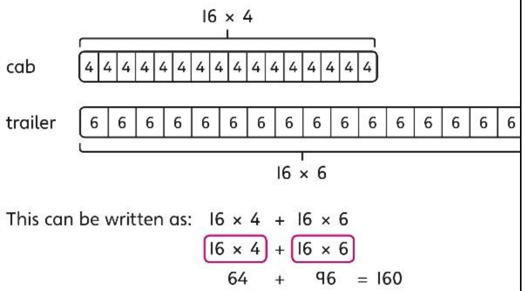
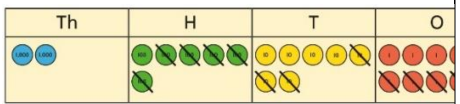
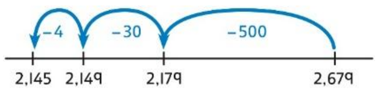
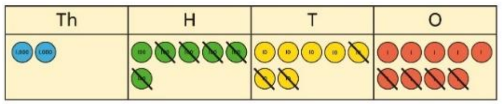
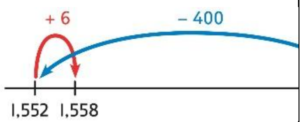
Year 6

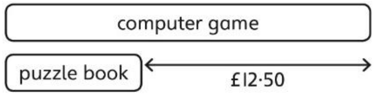
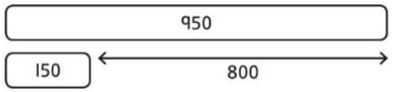
Year Six Addition and Subtraction
National Curriculum Objects

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context perform mental calculations, including with mixed operations and large numbers
- identify common factors, common multiples and prime numbers use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

	Concrete	Pictorial	Abstract	Vocabulary Further Questioning
Comparing and selecting efficient methods	Represent 7-digit numbers on a place value grid, and use this to support thinking and mental methods. 	Discuss similarities and differences between methods, and choose efficient methods based on the specific calculation. Compare written and mental methods alongside place value representations. Use bar model and number line representations to model addition in problem-solving and measure contexts. 	Use column addition where mental methods are not efficient. Recognise common errors with column addition. *32,145 + 4,302 = ?* 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 *Which method has been completed accurately?* *What mistake has been made?* Column methods are also used for decimal additions where mental methods are not efficient. H T O · Tth Hth 1 4 0 · 0 9 + 4 9 · 8 9 1 8 9 · 9 8 1	addition bridging place value exchange column total approximately approximating compare decimal difference digit estimating hundred hundreds of thousands million ten million minus nearest nearly negative numeral order place-holder formal written method pictorial concrete resources
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. 	Use a bar model to support thinking in addition problems. *257,000 + 99,000 = ?* 	Use place value and unitising to support mental calculations with larger numbers. *195,000 + 6,000 = ?* *195 + 5 + 1 = 201*	Round up/round down addition bridging place value exchange column total approximately

	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*	*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*	*195 thousands + 6 thousands = 201 thousands* *So, 195,000 + 6,000 = 201,000*	approximating compare decimal difference digit estimating hundred hundreds of thousands million ten million minus nearest nearly negative numeral order place-holder rounding column bridge place value bar model combine addition inverse difference additive and multiplicative relationships addition and subtraction equations facts formal written method pictotal concrete resources

Understanding order of operations in calculations	Use equipment to model different interpretations of a calculation with more than one operation. Explore different results. *3 × 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 × 16* *4 + 96 = 100* *(4 + 6) × 16* *10 × 16 = 160*	Brackets/order/division/multiplication/addition/subtraction concrete pictotal formal method first step organise procedure strategy interpret
Year 6 Subtraction				
Comparing and selecting efficient methods	Use counters on a place value grid to represent subtractions of larger numbers. 	Compare subtraction methods alongside place value representations. $\begin{array}{rrrrr} & Th & H & T & O \\ & 2 & 6 & 7 & 9 \\ - & & 5 & 3 & 4 \\ \hline & 2 & 1 & 4 & 5 \end{array}$	Compare and select methods. Use column subtraction when mental methods are not efficient. Use two different methods for one calculation as a checking strategy. $\begin{array}{rrrrr} & Th & H & T & O \\ & 1 & {}^{8}\cancel{9} & {}^{14}\cancel{5} & {}^{1}2 \\ - & 1 & 5 & 5 & 8 \\ \hline & & 3 & 9 & 4 \end{array}$ Use column subtraction for decimal problems, including in the context of measure.	difference total addition subtraction inverse counting on bridging compensation number bonds calculation representation represent difference less than

		Use a bar model to represent calculations, including 'find the difference' with two bars as comparison. 	H T O · Tth Hth 3 0 9 · 6 0 − 2 0 6 · 4 0 1 0 3 · 2 0	placeholder value operation exchange compensate representation represent subtract less than fewer formal method place value decimal point position
Subtracting mentally with larger numbers		Use a bar model to show how unitising can support mental calculations. *950,000 − 150,000* *That is 950 thousands − 150 thousands*  *So, the difference is 800 thousands.* *950,000 − 150,000 = 800,000*	Subtract efficiently from powers of 10. *10,000 − 500 = ?*	difference total addition subtraction inverse counting on bridging compensation number bonds calculation representation represent difference less than placeholder value operation representation represent subtract less than fewer pictotal formal method

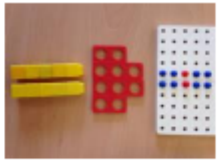
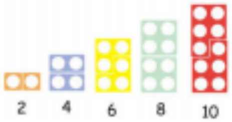
				relationship of number mental methods

Government Guidance Ready to Progress criteria
6AS/MD–1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).
6AS/MD–2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
6AS/MD–3 Solve problems involving ratio relationships
6AS/MD–4 Solve problems with 2 unknowns

Reception			
Mathematics Early Years Outcomes **ELG: Number** ● Children at the expected level of development will: ● Have a deep understanding of number to 10, including the composition of each number; ● Subitise (recognise quantities without counting) up to 5; ● Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. **ELG: Numerical Patterns Children at the expected level of development will:** ● Verbally count beyond 20, recognising the pattern of the counting system; ● Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; ● Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.			
Concrete	**Pictorial**	**Abstract**	**Vocabulary**
Reception Multiplication			

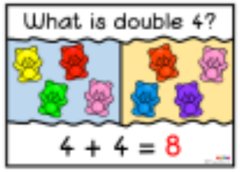
Within reception, a variety of concrete, pictorial and abstract resources will be used depending on the focus or unit. The teacher will use their professional judgement to decide which of these would be most appropriate. Concrete, pictorial and abstract resources can be used individually or collectively. Examples of these are below.

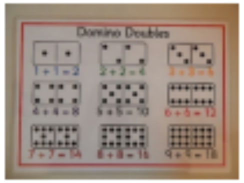
At The Oaks, we provide opportunities for children to;
- Solve problems including doubling

Counting and other maths resources for children to make 2 equal groups.


Physical and real life examples that encourage children to see concept of doubling as adding two equal groups.





Pictures and icons that encourage children to see concept of doubling as adding two equal groups.

1+1=	7+7=
2+2=	8+8=
3+3=	9+9=
4+4=	10+10=
5+5=	11+11=
6+6=	12+12=

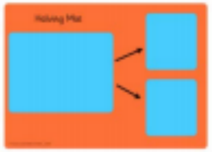
Addition calculations to model adding two equal groups.

Reception Division

At The Oaks, we provide opportunities for our children to;
-solve problems including halving and sharing;
-halve a whole, halving a quantity of objects;
-share a quantity of objects.

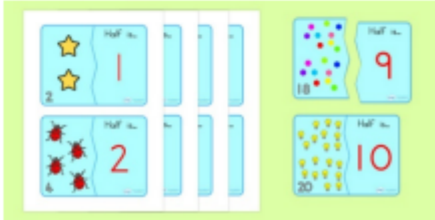
Children have the opportunity to physically cut objects, food or shapes in half.

Counting and other maths resources for children to share into two equal groups.

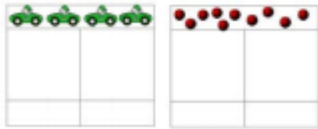


Use visual supports such as halving mats and part part whole, with the physical objects and resources that can be manipulated.

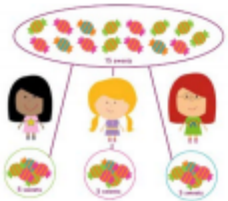
Counting and other maths resources for children to explore sharing between 3 or more.



Pictures and icons that encourage children to see concept of halving in relation to subitising, addition and subtraction knowledge. i.e. Knowing 4 is made of 2 groups of 2, so half of 4 is 2.



Bar model with pictures or icons to support understanding of finding 2 equal parts of a number, to further understand how two halves make a whole.



Pictures for children to create and visualise 3 or more equal groups.

There is not an expectation in Reception for children to write division related symbols.

Year 1				
Year One Addition and Subtraction **National Curriculum Objects** ● add and subtract numbers mentally, including: ○ a three-digit number and 1s ○ a three-digit number and 10s ○ a three-digit number and 100s ● add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction ● estimate the answer to a calculation and use inverse operations to check answers ● solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction				
	Concrete	**Pictorial**	**Abstract**	**Vocabulary** **Further Questioning**