



Rawmarsh Ryecroft Infant School

Calculation Policy

Reviewed: March 2025

Next Review Due: March 2027

Foundation Stage 2 Age-Related Expectations

Cardinality and Counting

Objective & Expected Outcome	Activities and opportunities	Notes
Counting: saying number words in sequence.	Activities and opportunities: - counting backwards, for example <i>number rhymes</i> - starting from different numbers. 1 2 3 4 5 Number Rhymes e.g. 5 current buns 11 12 Progress to larger numbers.	When practising counting, children need to know number names, initially to five, then ten, and extending to larger numbers, including crossing boundaries 19/20 and 29/30. Counting back is a useful skill, but young children will find this harder because of the demand this places on the working memory.

Counting: tagging each object with one number word. (1:1 counting)

Activities and opportunities:

- counting things of different sizes - this helps children to focus on the numerosity of the count.
- counting things that can't be seen, such as sounds, actions, words.
- counting things that cannot be moved, such as pictures on a screen, birds at the bird table, faces on a shape.



Children can count sets of objects with correct one to one correspondence, saying the number and touching. (regular and irregular arrangements)

Children need lots of opportunities to count things in irregular arrangements. For example, how many play people are in the sandpit? How many cars have we got in the garage? These opportunities can

also include counting things that cannot be seen, touched or moved.

Counting: knowing the last number counted gives the total so far.	Activities and opportunities: - playing dice games to collect a number of things. Count out a number from a large group. - playing track games and counting along the track.	The cardinal value of a number refers to the quantity of things it represents, e.g. the numerosity, 'howmanyness', or 'threeness' of three. Children need the opportunity to count out or 'give' a number of things from a larger group, not just to count the number that are there. This is to support them in focusing on the 'stopping number' which gives the cardinal value.
Subitising: recognising small quantities without needing to count them all.	Activities and opportunities: - using dot cards, dominoes and dice as part of a game, including irregularly arranged dots (e.g. stuck on) - playing hidden objects games where objects are revealed for a few seconds, for example, small toys hidden under a bowl - shuffle them, lift the bowl briefly and ask how many there were 'all at once fingers' - show me four fingers.	Subitising is recognising how many things are in a group without having to count them one by one. Children need opportunities to see regular arrangements of small quantities, e.g. a dice face, structured manipulatives, etc., and be encouraged to say the quantity represented. Children also need opportunities to recognise small amounts (up to five) when they are not in the 'regular' arrangement, e.g. small handfuls of objects.

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Numerals meanings

Activities and opportunities:

- using numeral dice in games; matching numerals with varied groups of things.



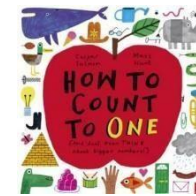
- using 'tidy-up labels' on containers and checking that nothing is missing.

- reading number books

- putting the right number of snacks on a tray for the number of



children shown on a card.

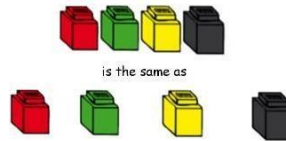


Children need to have the opportunity to match a number symbol with a number of things. Look for opportunities to have a range of number symbols available, e.g. wooden numerals, calculators, handwritten - include different examples of a number:

Conservation: knowing that the number does not change if things are rearranged (so long as none have been added or taken away)

Activities and opportunities:

- correcting a puppet who may say that there are more or fewer objects now, as they have been moved around, e.g. spread out or pushed together.



Children need the opportunity to recognise amounts that have been rearranged and to generalise that, if nothing has been added or taken away, then the amount is the same.

- contexts such as sharing things out (grouping them in different ways) and then the puppet complaining that it is not fair as they have less.



For example - Can you group the cars in a different way?



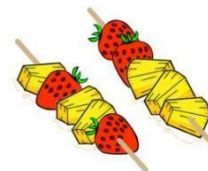
- encourage the children to make different patterns with a given number of things.



Part-whole: identifying smaller numbers within a number (conceptual subitizing - seeing groups and combining to a total)	Activities and opportunities: encouraging making arrangements with (e.g.) ten. Ensure the children talk about the different arrangements they can see within the whole. 	Children need opportunities to see small numbers within a larger collection. 'Number talks' allow children to discuss what they see. For instance, with giant ladybirds: 'There are 5 spots altogether. I can see 4 and 1, I can see 3 and 2, and I can see 1 and 1 and 1 and 1 and 1.' Encourage exploration of all the ways that 'five' can be and look. Children are encouraged to look closely at numbers to
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		see what else they can see. This reinforces the concept of conservation.
Inverse operations	Activities and opportunities: - exploring songs; for example, 'Five Currant Buns' - show that the whole is still five, but some are in the shop and some have been taken away; check throughout that there are still five currant buns. - playing skittles and looking at how many are standing. How many have fallen over? How many are there altogether?  	Children need opportunities to partition a number of things into two groups, and to recognise that those groups can be recombined to make the same total. Encourage children to say the whole number that the 'parts' make altogether.

A number can be partitioned into different pairs of numbers	Activities and opportunities: • Numicon towers: layering up Numicon pieces of the same total. • putting things into two containers in different ways • making a number with two different kinds of things. For example, make a fruit skewer with five pieces of fruit, using bowls of bananas/strawberries to choose from; then ask the children to describe how they have made theirs. They should compare it with a partner's: 'What is the same about your skewers? What is different?'	Children need opportunities to explore a range of ways to partition a whole number. The emphasis here is on identifying the pairs of numbers that make a total. Children can do this in two ways - physically separating a group, or constructing a group from two kinds of things.
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	- Bunny Ears: using your fingers like bunny ears. 'With two hands, show me five fingers. Can you do it in a different way?' Or, 'Show five fingers altogether with a friend' - Spill the Beans: using double-sided counters or beans, where one side is coloured, throw the collection and note how many of each type can be seen and how many altogether.  - using six bean bags with different fabric on each side, throw the collection and note how many of each type can be seen.	
A number can be partitioned into more than two numbers	Activities and opportunities: - role play, e.g. in a toy shop, ten toys need arranging onto the three shelves. How will you organise them? - having more than two places to sort things into in any given context, e.g. arranging characters in small-world play in different locations. - games such as 'Posh Ducks' (Griffiths, R., Back, J.& Gifford, S. (2016) <i>Making Numbers: Using manipulatives to teach arithmetic OUP</i>): using a set number of ducks, for example ten in  	Children need opportunities to explore the different ways that numbers can be partitioned, i.e. into more than two groups. Situations to promote this include increasing the number of pots to put a given amount into, e.g. planting ten seeds into three or more pots.

	three different locations (nest, water, decking), roll the dice and make one group match the amount shown without adding or taking any away.	
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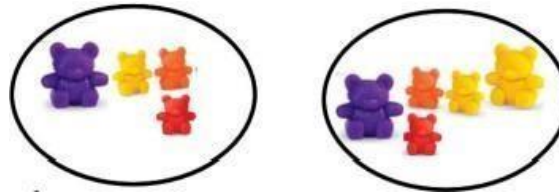
Number bonds: knowing which pairs make a given number.	Activities and opportunities: - playing hiding games with a number of objects in a box, under a cloth, in a tent, in a cave, etc. - utilising classroom routines such as identify how many missing from a pot label.  	 tidy-up time to are still with a number Children need opportunities to say how many are hidden in a known number of things. For example: 'Five toys go into a tent, then two come out. How many are left in the tent?' The child should respond that there are still three toys in the tent.
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Comparison

More than/less than

Activities and opportunities:

- collections for children to sort and compare, which include objects which are identical, and which include objects of different kinds or sizes.
- collections with a large number of things, and collections with a small number of things.

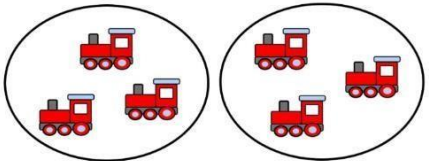
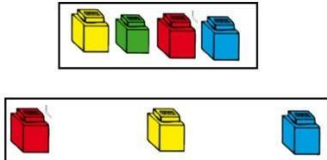


Children need progressive experiences where they can compare collections and begin to talk about which group has more things. Initially, the groups need to be very obviously different, with one group having a widely different number of things. Collections should also offer challenges, such as including more small things and fewer large things, to draw attention to the numerosity of the comparison, i.e. the number of things, not the size of them.

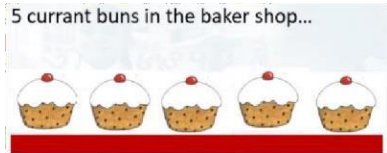
Identifying groups with the same number of things

Activities and opportunities:

Children need the opportunity to see that groups could consist of equal numbers of things. Children can check

	- ensuring that when providing groups to compare, there are some that have an equal amount.  - asking children to convert two unequal groups into two that have the same number, e.g. 'There are 6 apples in one bag and 2 in another bag; can we make the bags equal for the two hungry horses?'	that groups are equal, by matching objects on a one-to-one basis.
Comparing numbers and reasoning	Activities and opportunities: - explain unfair sharing - 'This one has more because it has 5 and that one only has 3'  - compare numbers that are far apart, near to, and next to each other.	Children need opportunities to apply their understanding by comparing actual numbers and explaining which is more. For example, a child is shown two boxes and told one has 5 sweets in and the other has 3 sweets in. Which box would they pick to keep and why? Look for the reasoning in the response they give, i.e. 'I would pick the 5 box because 5 is more than 3 and I want more.' If shown two numerals, children can say which is larger by counting or matching one-to-one. Children can compare numbers that are far apart, near to and next to each other. For example, 8 is a lot bigger than 2 but 3 is only a little bit bigger than 2.

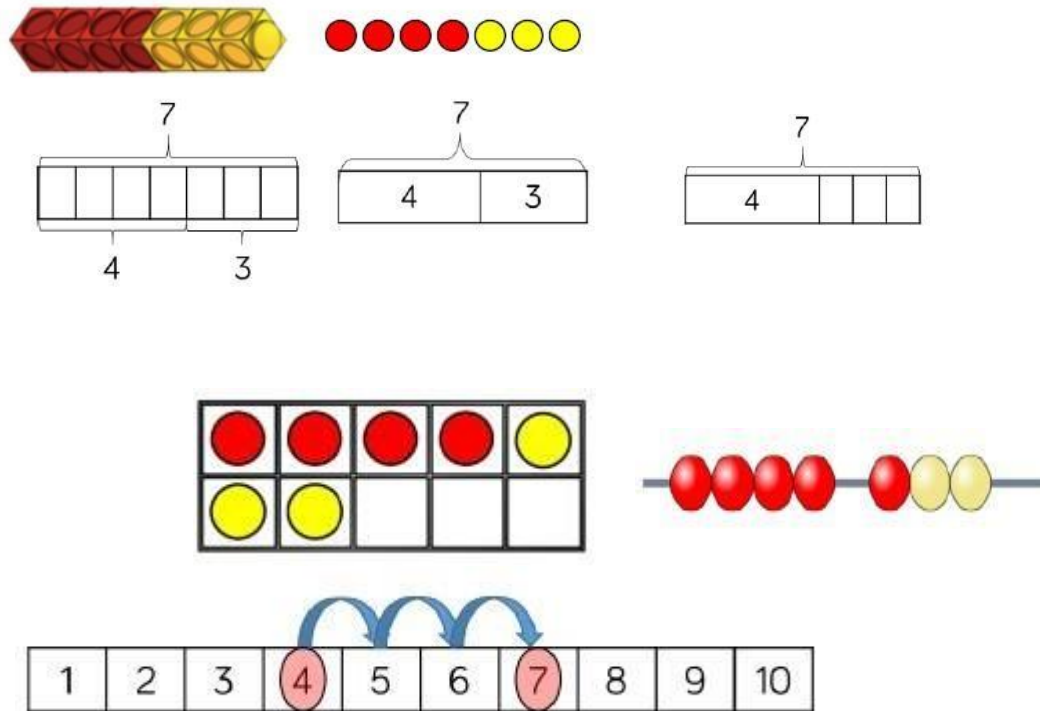
Knowing the 'one more than/one less than' relationship between	Activities and opportunities:	Children need opportunities to see and begin to generalise the 'one more than/one less than' relationship between
counting numbers.	- labelling groups with the correct numeral. Do children spot the error if a group is mislabelled? For example, 'The label on the pot says 4 and we have 5 - what do we need to do?' A child may say, 'We need to take one out because we have one too many.' - ensuring children focus on the numerosity of the group by having items in the collection of different kinds and sizes. - making predictions about what the outcome will be in stories, rhymes and songs if one is added to, or if one is taken away.	sequential numbers. They can apply this understanding by recognising when the quantity does not match the number, i.e. if a pack is labelled as 5 but contains only 4, the children can identify that this is not right. Support children in recognising that if they add one, they will get the next number, or if one is taken away, they will have the previous number. For example: 'There are 4 frogs on the log, 1 frog jumps off. How many will be left? How do you know?'



Addition and Subtraction

Year 1 Age-Related Expectations		
Objective & Expected Outcome	Models & Images	Notes

Add 1 digit numbers
within 10

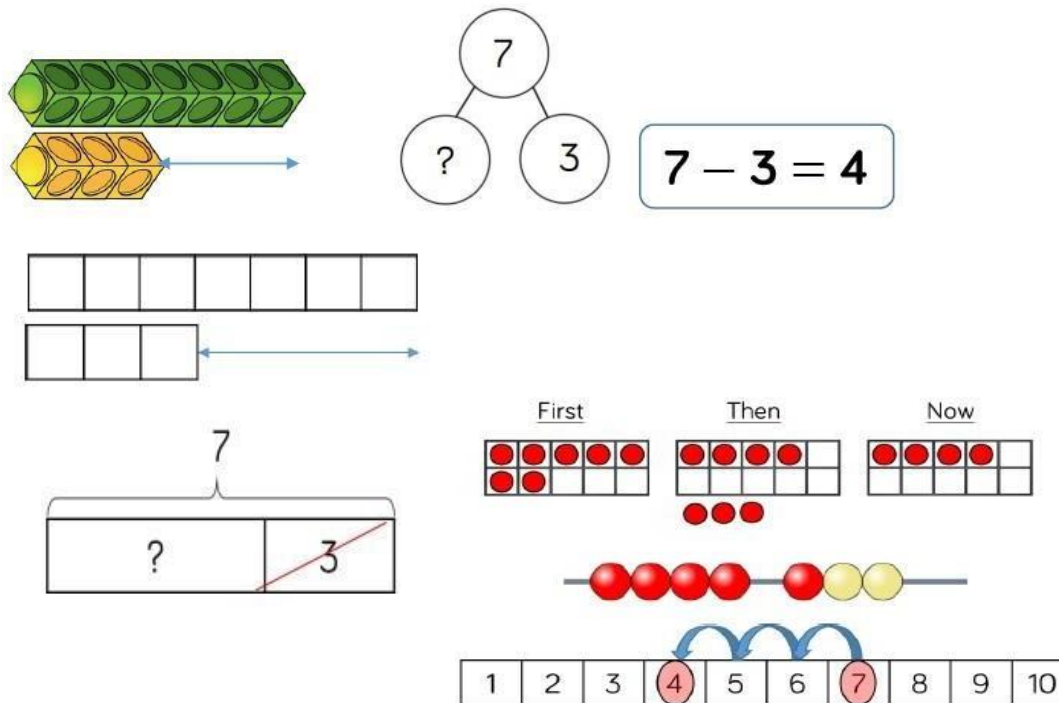


When exploring number bonds to 10, children must explore the fact families as shown in the bar models. This includes identifying missing numbers e.g. $7 = ? + 9$

As well as supporting with addition, Numicon helps children to start to recognise odd and even numbers.

These strategies all support the process of combining two or more quantities or measures to find a total.

Subtract 1 digit
numbers within 10

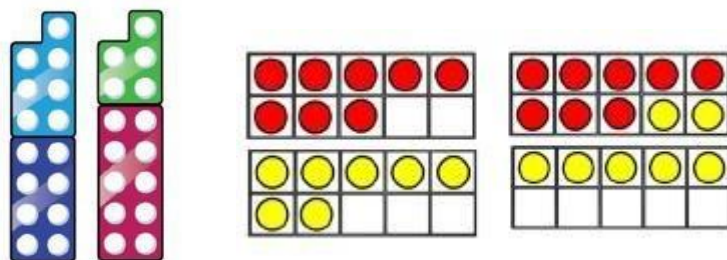


Ten frames, number tracks and bead strings support the visual act of reducing the number with subtraction.

Using single Dienes bricks (the ones) would also be helpful for 'taking away'.

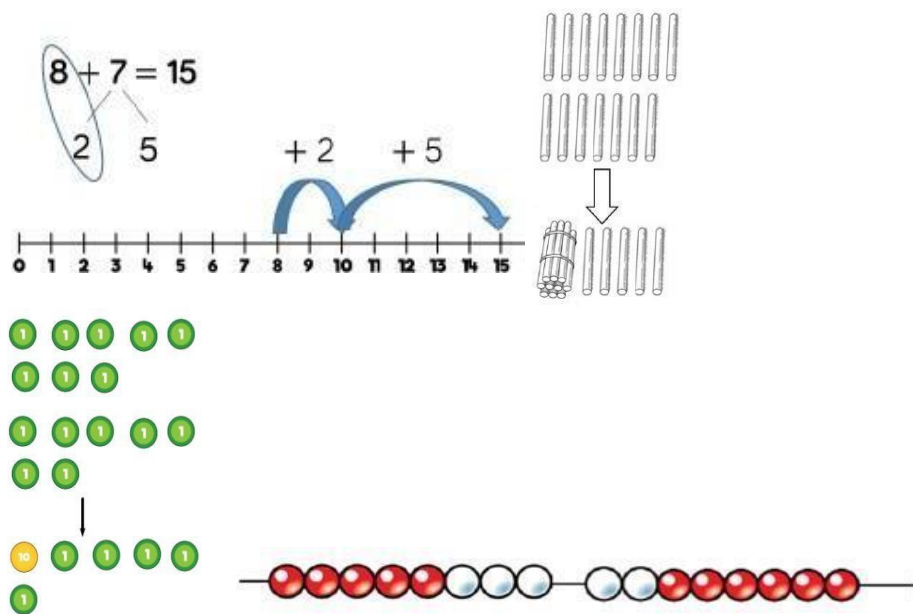
Cubes and bar models with two bars can support finding the difference.

Add 1 and 2-digit numbers to 20



As well as supporting children with addition Numicon helps children to start to recognise odd and even numbers.

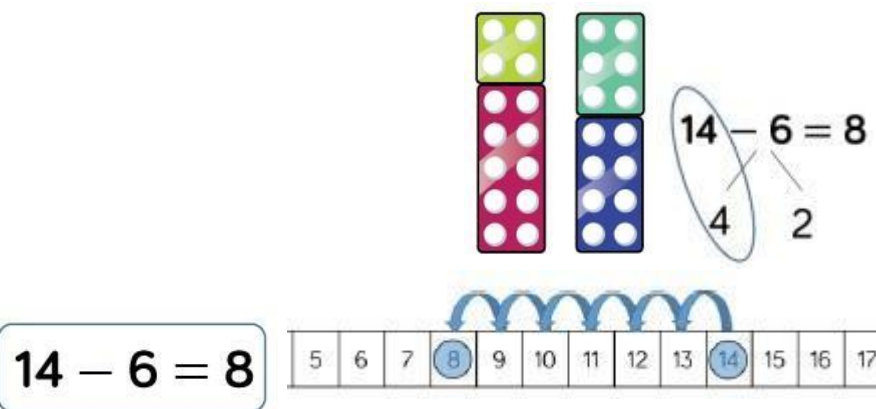
When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. In Year 1, this is only done just by counting on.



Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.

To strengthen understanding of place value, children would partition the second number when adding mentally, making up the number bond to 10.

Subtract 1 and 2-digit numbers to 20

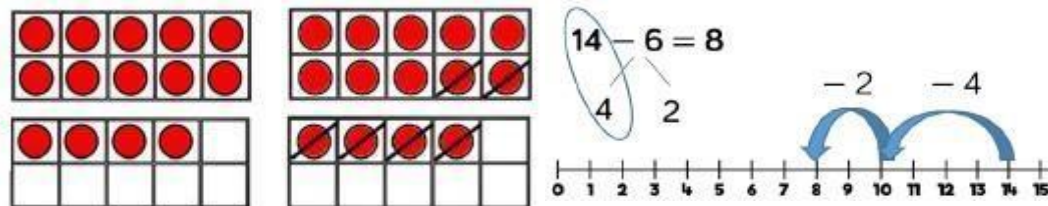


$$14 - 6 = 8$$

When the children's understanding of place value is insecure, counting on will offer more success than counting backwards.

When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames and



$$14 - 6 = 8$$

number lines are particularly useful for this.

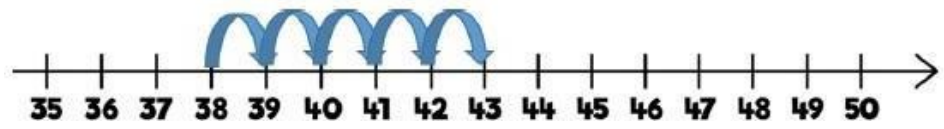
Year 2 Age-Related Expectations

Objective & Expected Outcome

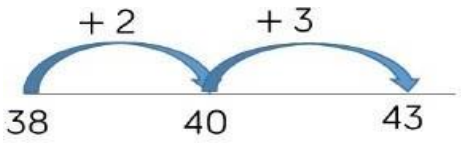
Models & Images

Notes

Add 1 digit and 2-digit numbers to 100



$38 + 5 = 43$



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

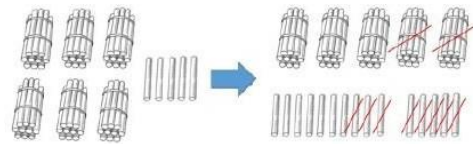
They should also apply their knowledge of number bonds to add more efficiently e.g. $9 + 5$ is the same as $9 + 1 + 4$.

Children need to begin to explore patterns and recognise that if $3 + 5$ is 8 then $30 + 50$ will be 80.

Hundred squares, Numicon, ten frames and straws all support children in finding the number bonds.

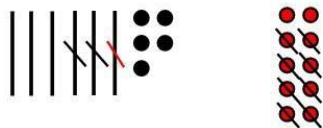


Subtract a 2-digit number from a 2-digit number (up to 100)

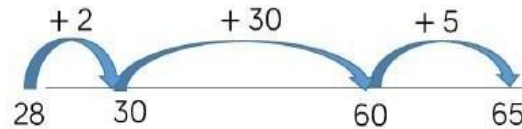


$$65 - 28 = 37$$

$$65 - 28 = 37$$



Tens	Ones



Tens	Ones

Children can also use a blank number line to count on to find the difference. Encourage them to jump in multiples of 10 to become more efficient.

When children use a number line, if they struggle to add 30 all at once, they need to be taught to chunk it into +10 then +10 then +10 with three separate jumps on the line.

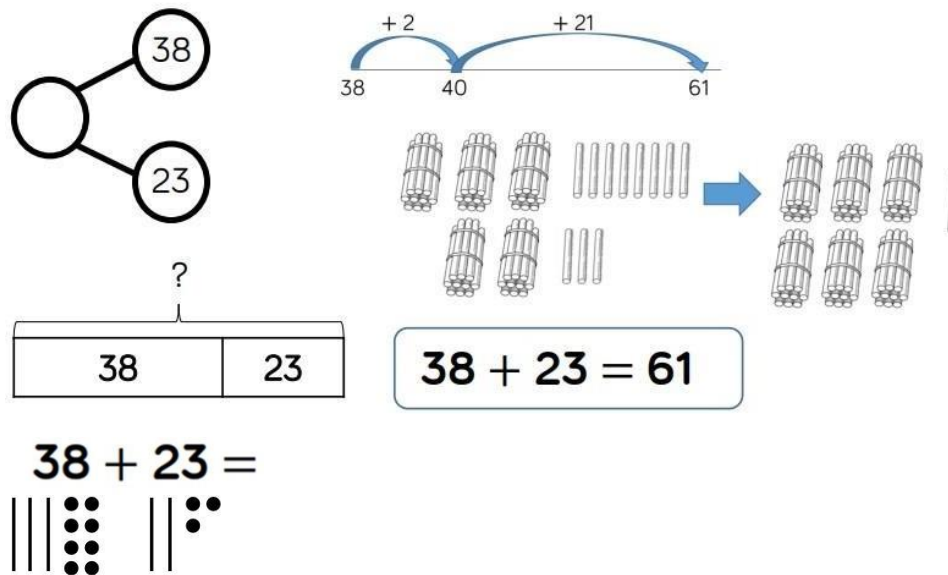
100 squares can also be used, counting back first the ones and then the tens.

This can then move to formal recording using jottings to support but focusing on finding the answer first subtracting ones and then tens.

Jottings to be arranged clearly so that children are able to subitise a group without having to count them one by one.

		Children should be encouraged to subtract the ones column first in preparation to moving onto column addition. Children should then move to bridging ten when this method is concrete.
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Add two 2-digit numbers to 100

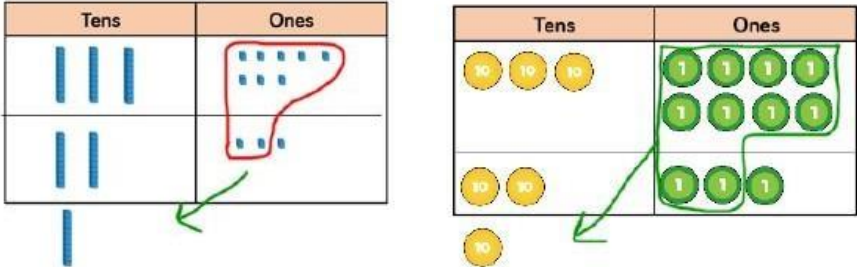
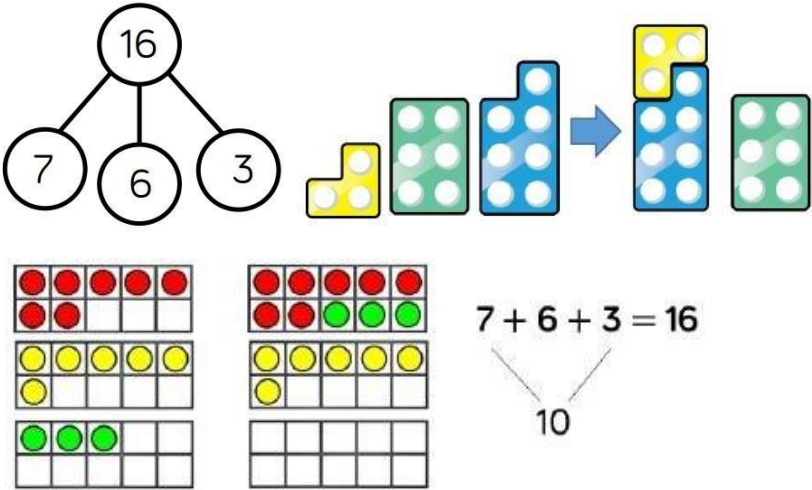


Start by adding multiples of 10. For example - $34 + 20 = 54$ as this allows children to consolidate their understanding of increasing a number by 10.

Children may need to start by using Base 10, bundles or place value counters to add 2-digit numbers.

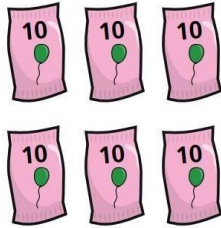
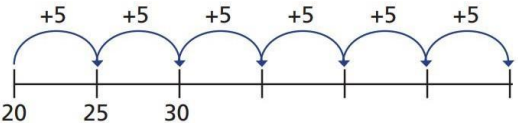
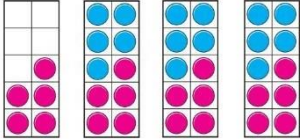
This can then move to formal recording using jottings to support but focusing on finding the total of ones and then the total of tens. Jottings to be arranged clearly so that children are able to subitise a group without having to count them one by one.

Children should then move to bridging ten when this method is concrete.

		Bar models allow children to really see the calculation and understand the parts that make up the whole but they don't help them to actually carry out the calculation at this stage.
Add three 1-digit numbers	 $7 + 6 + 3 = 16$ 10	When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles, to help them to add the numbers more efficiently. Not only does this strengthen the children's understanding of number bonds but it supports their understanding of commutativity. Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

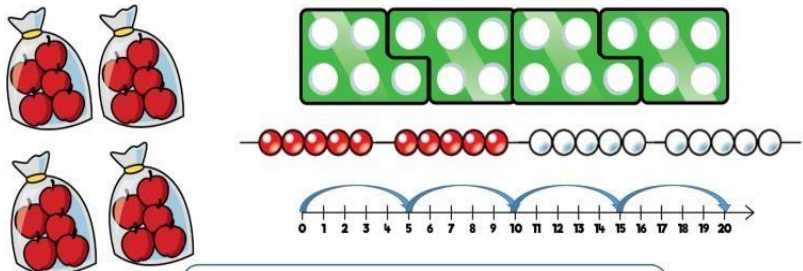
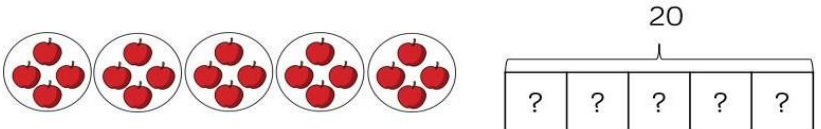
Multiplication and Division

Year 1 Age-Related Expectations

Objective & Expected Outcome	Models & Images	Notes
Solve one-step problems with multiplication	   	In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally. Use counting objects and pictorial representation to solve multiplication problems. Children group items into 2s, 5s or 10s and count in groups. Children make connections between arrays, number patterns and counting up in 2s, 5s and 10s.

Solve one-step problems using division (sharing)	$20 \div 5 = 4$ Share the bananas into 5 equal groups.	In year 1, children use concrete and pictorial representations to solve problems. They are not expected to record divisions formally. This should be done physically with apparatus, moving onto making jottings with pencil.
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Year 2 Age-Related Expectations		
Objective & Expected Outcome	Models & Images	Notes

Solve one-step problems with multiplication	 One bag holds 5 apples. How many apples do 4 bags hold? $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ $5 \times 4 = 20$	Children represent multiplication as repeated addition in many different ways In Year 2, children are introduced to the multiplication symbol. Children can use counters to explore arrays.
Solve one-step problems using division (sharing)		Children solve problems by sharing amounts into equal groups. In year 2, children are introduced to the division symbol. The sharing method reinforces the 'one for you, one for you, one for you' concept.

	There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag? $20 \div 5 = 4$	
Solve one-step problems using division (grouping)	There are 20 apples altogether. They are put in bags of 5. How many bags are there? $20 \div 5 = 4$	Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division. The grouping method encourages counting in multiples. '5 for you, 5 for you' until they have all gone.