MathsHUBS Resources

National Centre for Excellence in the Teaching of Mathematics

Mastery Professional Development

Number, Addition and Subtraction

1.3 Composition of numbers: 0–5

Teacher guide | Year 1

Teaching point 1:

Numbers can represent how many objects there are in a set; for small sets we can recognise the number of objects (subitise) instead of counting them.

Teaching point 2:

Ordinal numbers indicate a single item or event, rather than a quantity.

Teaching point 3:

Each of the numbers one to five can be partitioned in different ways.

Teaching point 4:

Each of the numbers one to five can be partitioned in a systematic way.

Teaching point 5:

Each of the numbers one to five can be partitioned into two parts; if we know one part, we can find the other part.

Teaching point 6:

The number before a given number is one less; the number after a given number is one more.

Teaching point 7:

Partitioning can be represented using the bar model.

Autumn 2017 pilot

Overview of learning

In this segment children will:

- become fluent in enumerating the number of objects in sets up to and including five
- learn the difference between cardinality and ordinality, and learn the names (for example, 'first') and short-hand representations (for example, 1^{st}) of the ordinals up to fifth
- explore the composition of the numbers one to five, working towards a systematic approach to find all of the ways each number can be partitioned into two parts
- develop fluency in partitioning the numbers one to five, and solve missing part problems
- develop fluency in 'one more' and 'one less' for the numbers one to five
- learn how to represent partitioning using the bar model.

The primary aim of this segment is for children to develop factual and conceptual fluency for the numbers to five, including:

- subitising – children should be able to quickly, accurately and confidently recognise the number of objects in a group without counting
- ordinality – children should be able to confidently use the names (for example, first) and short-hand representations (e.g. 1st), as well as being able to identify and name, for example, the third tallest person in a line
- partitioning – by the end of the segment, children should be well on their way to having factual and conceptual fluency in all of the 'number bonds' for each of the numbers to five (for example, if they are told the whole is five and one part is two, they should be able to immediately identify that the other part is three); additional practice in committing number facts to memory should be provided outside of the main maths lesson
- 'one more' and 'one less' – given any number children should be able to confidently identify 'one more' and 'one less', and they should be able to complete missing number sequences.

In this segment children deepen their understanding and develop fluency in the composition of the numbers to five, through the structure of partitioning. Partitioning underpins many later concepts such as addition and subtraction, and place value. The segment will also introduce some new concepts and ways of working. The difference between cardinality and ordinality is explored; for example, the difference between *'Circle three cars'* and *'Circle the third car.'* Children will also learn how to work systematically, using double-sided counters, to find all of the ways a number can be partitioned into two parts – this is presented in the context of ensuring that we identify and learn all of the 'number pairs' for each of the numbers one to five; the approach will be used again in segment *1.4 Composition of numbers: 6–10*. When learning 'one more' and 'one less', the concept of 'movement is magnitude' will be explored, using multilink staircases and number lines. Finally, once children have gained some fluency in partitioning for this number set, and using the cherry representation, they are introduced to the bar model.

In later segments children will gain further exposure to the bar-model representation. In general, the cherry model or bar model can be used interchangeably, according to preference, although there are some cases where one is more appropriate or useful than the other. In the upcoming segments we present either both together (as a reminder that either one could be used), or one or the other (for variation or because one is more appropriate in a given context). It is recommended that when teaching any new concept just one representation is used, to help children progress through the conceptual steps more smoothly; once children have mastered a concept either model can be used to present varied practice.

An explanation of the structure of these materials, with guidance on how teachers can use them, is contained in this NCETM podcast: www.ncetm.org.uk/primarympdpodcast. The main message in the podcast is that the materials are principally for professional development purposes. They demonstrate how understanding of concepts can be built through small coherent steps and the application of mathematical representations. Unlike a textbook scheme they are not designed to be directly lifted and used as teaching materials. The materials can support teachers to develop their subject and pedagogical knowledge and so help to improve mathematics teaching in combination with other high-quality resources, such as textbooks

Teaching point 1:

Numbers can represent how many objects there are in a set; for small sets we can recognise the number of objects (subitise) instead of counting them.

Steps in learning

	Guidance	Representations
1:1	The purpose of this teaching point is for children to develop complete fluency in both counting and subitising (see step *1:4*) within five.	Numberblock (1-10):

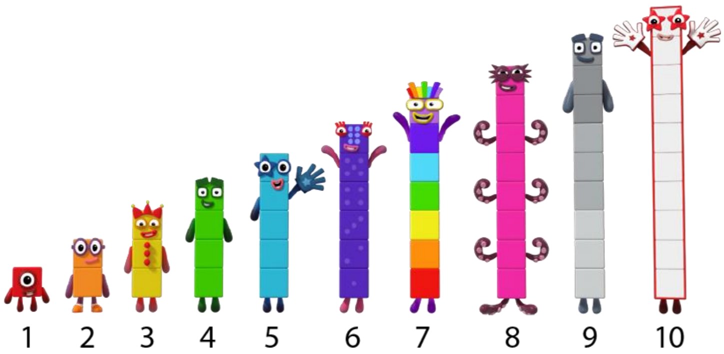
Before beginning detailed work on the numbers 0–5, review counting to ten. Provide children with frequent opportunities to chant/sing number-based rhymes and songs, as well as count forwards and backwards, to build a sense of sequence and synchronicity. This will allow you to see whether any children have not secured the stable-order principle (knowing that the list of words used to count must be in a specific, repeatable order).

When using counting rhymes and songs, make sure you link the following four aspects of number:

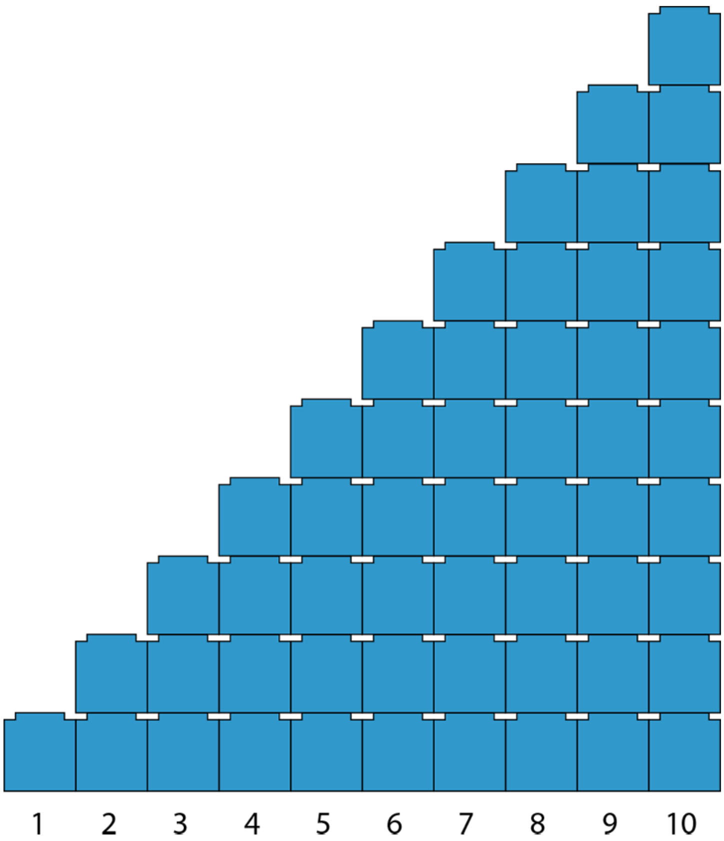
- names (for example, 'four')
- numerals (for example, 4)
- quantity or cardinal value (a set of four objects)
- place in the linear number system (seeing that the number four 'sits' between three and five)

Chanting or singing *'one, two, three…'* develops fluency with the counting sequence. However simultaneously counting and pointing to:

- objects, such as the Numberblocks images or sets of items, will help children to make links between the number name and quantity value of each number
- a number line or number track will help children to make links between



Multilink 'staircase':



<table>
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<td>the number name, numeral, and 'location' of each number.

You can find more detail on important counting principles in segment 1.1 Comparison of quantities and measures.</td>
<td>Number track:

<table>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
<tr><td>one</td><td>two</td><td>three</td><td>four</td><td>five</td><td>six</td><td>seven</td><td>eight</td><td>nine</td><td>ten</td></tr>
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<td>1:2</td>
<td>Now move on to a detailed study of the numbers 0–5, beginning with enumerating small sets by counting. The focus should be on children further developing fluency in counting and securing the cardinality principal (that the last number of a count represents the number in the group).

Present children with a range of contexts and concrete objects to count, including cases with zero objects. Relate this to 'finding the total' number of objects in a set. Encourage children to count and then use a full sentence to describe the completed count as the total, for example:

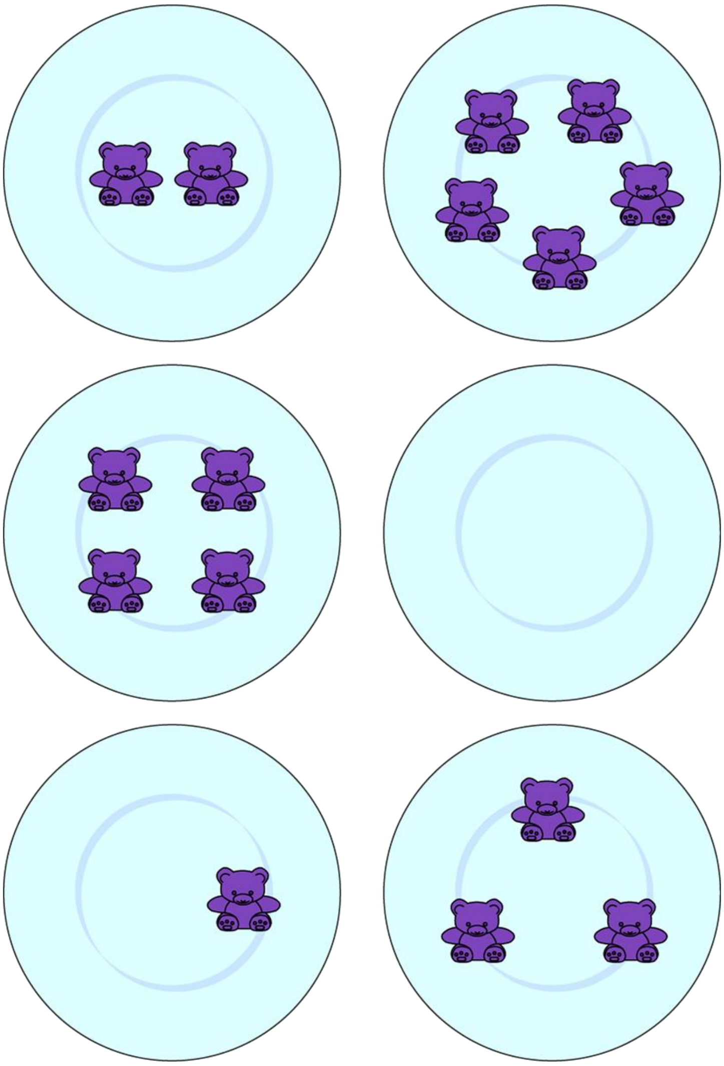
• 'One, two, three, four. There are four bears.'
• 'There are no bears.'

Repeatedly use the stem sentence:
'One, two… There are ___ objects.'

Using concrete objects will help children who have not yet secured the one-to-one correspondence principle (each item should be counted once, but once only); for more information on this, see segment 1.1 Comparison of quantities and measures, step 2:2. At the same time, children will gain familiarity with the quantity value of the numbers.

Also show children groups containing different sets of items, such as a mixture of fruit. It is important to consider zero – for example, by asking how many there are of something that isn't present.</td>
<td>Sets of identical objects:

'How many bears are there on each tray?'

</td>
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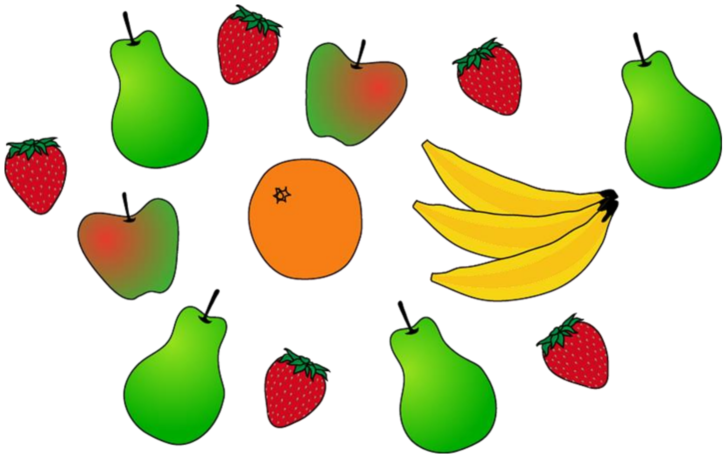
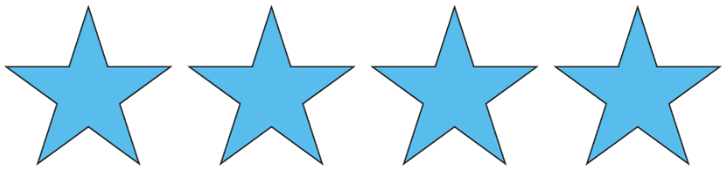
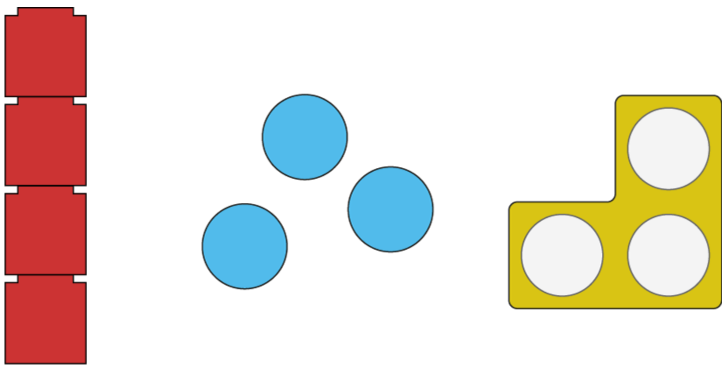
	Throughout, continue to use and link number names, numerals and quantity value.	Mixed sets of objects: • *'How many pears are there?'* • *'How many potatoes are there?'* 
1:3	Build on the previous step, introducing both pictorial representations of real-life objects and generalised representations (such as four counters representing four cats). Movement to these representations necessarily increases the challenge, because: • with pictorial representations, the individual objects can no longer be moved as children count • generalised representations (either concrete manipulatives, or pictorial versions) represent a level of abstraction from real-world contexts. Encourage depth, by presenting true/false-style questions.	*'Ling says there are three stars. Is she right?'* 
1:4	The culmination of this teaching point should be children's ability to subitise for the numbers one to five – i.e. to recognise the number of objects in the set *without* counting. Encourage children to subitise, by moving away from counting concrete objects systematically (for example, moving them from a 'not yet counted' group to a 'counted' group) and building fluency in the rapid, accurate, confident judgement of the total number. Present	Spot the mistake: *'Which of the following does not represent three?'* 

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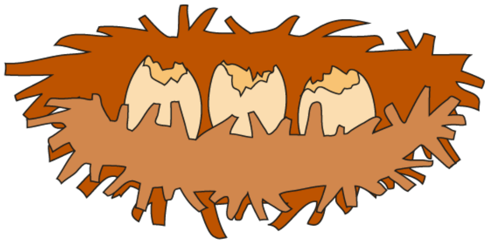
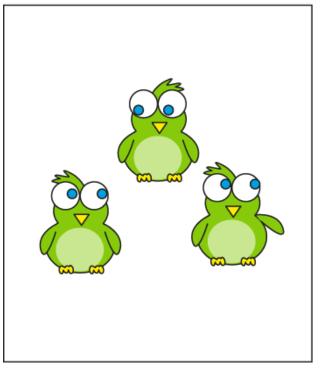
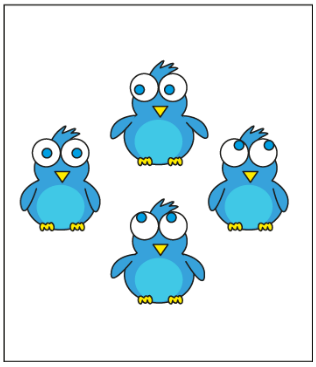
<td>sets as before, but now ask 'Can we just see how many there are without counting?' Children should practise until counting is no longer their primary strategy for enumerating sets within five.

Use familiar contexts too, such as dice and fingers/hands (children may be better able to subitise these), as well as familiar representations, such as base-ten number boards.

Use spot-the-mistake or match-the-items problems to assess children's ability to subitise.</td>
<td>Match the items:

'Which group of chicks matches the eggs? Explain why.'



 </td>
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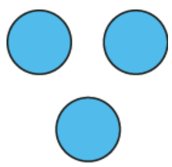
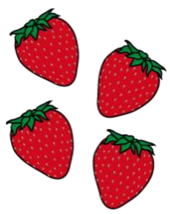
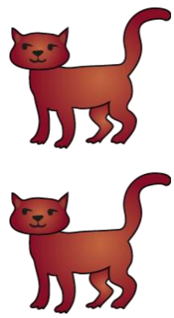
<td>1:5</td>
<td>The teaching sequence began with chanting/singing to ten, and linking number names, numerals and quantity values. Once children can confidently subitise within five, provide them with varied practice moving between these representations, including:
enumerating a set of objects (concrete, pictorial or generalised representation) and recording the total as both number names and numerals; continue to encourage subitising instead of counting
preparing a set of objects to match a number card or instruction (for example, 'Show me four cubes.')
drawing a quantity of items to represent a number presented with either its name or numeral.
In step 1:1 children were linking number names, numerals and cardinality within the context of counting. By this point they should have progressed to making these links in different contexts and with the use of subitising. They should be able to move easily between different</td>
<td>Enumerating objects:

'Find the totals. Record using the number name and the numeral.'

<table><tr><td></td><td></td><td></td></tr><tr><td>three</td><td></td><td></td></tr><tr><td>3</td><td></td><td></td></tr></table></td>
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<td>concrete/pictorial representations, numerals and number names.</td>
<td>'Use drawings to show these numbers.'
<table>
<tr><th>one</th><th>zero</th><th>4</th></tr>
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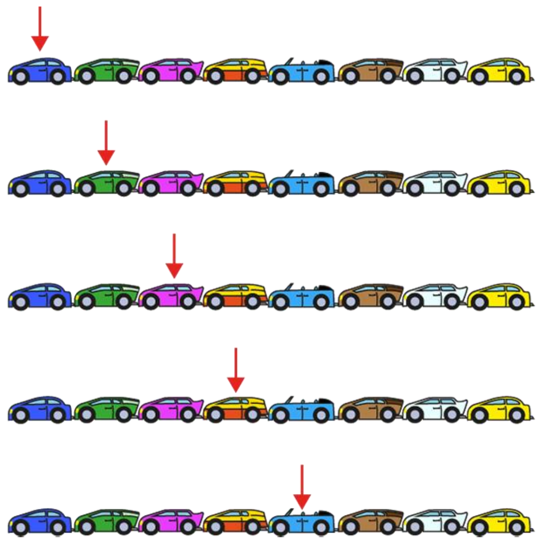
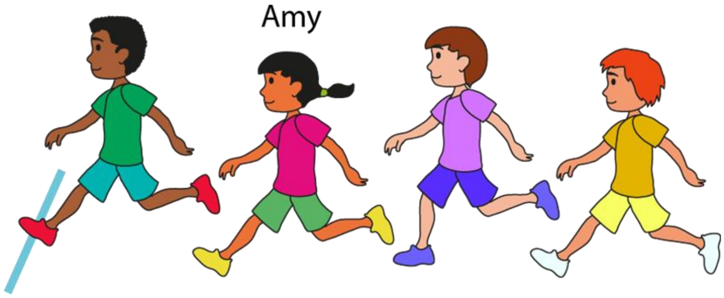
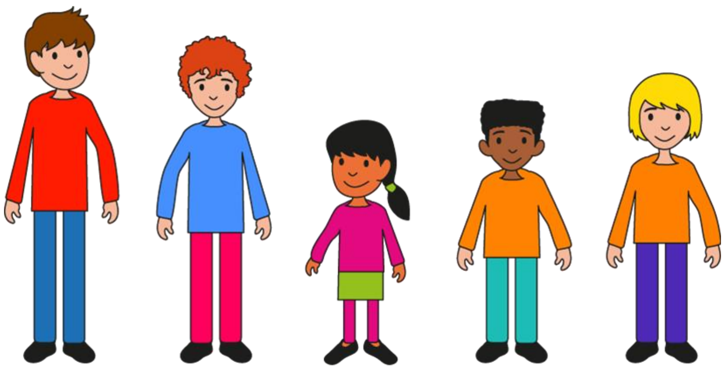
Teaching point 2:

Ordinal numbers indicate a single item or event, rather than a quantity.

Steps in learning

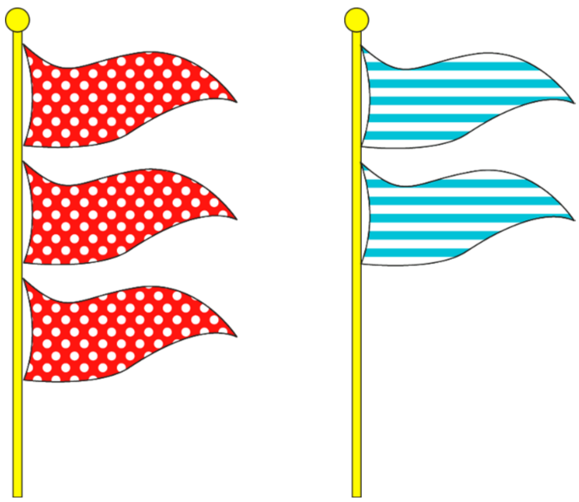
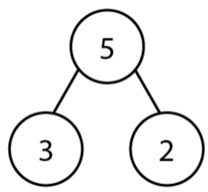
	Guidance	Representations
2:1	Children may have some prior experience of ordinal numbers from everyday life (for example, *'I came third in the race'*) but it is important to explore the difference between ordinal and cardinal numbers. Begin by reviewing how ordinal numbers are named and represented, starting with the shortened written form (1^{st}, 2^{nd}, 3^{rd}, 4^{th}, 5^{th}) and then linking with the full written names. Children may initially struggle with 'first' and 'second', since they don't contain the number names 'one' and 'two'; later ordinals may be more accessible since they *do* contain the number names, to an extent – for example, '**thr**ee' and '**thi**rd', '**four**' and '**four**th'. Use concrete or pictorial representations to present the ordinal numbers, then practise counting using the ordinal names (*'First, second, third…'*). Point to the relevant item as you count as a class. Use contexts for which the 'first' and 'last' are clearly defined; toy cars or people in queues are useful examples since they clearly have a 'front' and 'back' so there is less likely to be confusion about which end of the line is defined as the 'first'. Check that children can link the full written names (for example, 'first') with the shortened written forms (for example, '1^{st}'), and that they can write them. Ask children, for example, to *'Circle the third car'* or *'Circle the 3^{rd} car'*. By now they should be confident with both notations.	Counting with ordinals: first … 1st second … 2nd third … 3rd fourth … 4th fifth … 5th  *'Join the pairs.'* fourth — 5^{th} first — 3^{rd} third — 1^{st} fifth — 4^{th} second — 2^{nd}

2:2	Once children can confidently use the names and shortened written forms of ordinal numbers, highlight the difference between cardinal and ordinal numbers – i.e. the difference between quantity and position. Again, present children with a line of items and set them pairs of tasks, such as: • *'Circle three cars.'* • *'Circle the third car.'* or • *'How many children were in the race?'* • *'Where did Amy come in the race?'*	• *'How many children were in the race?'* • *'Where did Amy come in the race?'* 
2:3	To provide extra challenge, use a dòng nǎo jīn question that presents a selection of items that are not already shown in the 'correct order'; ask children to identify, for example, the third tallest.	*'These people line up starting with the tallest at the front, and ending with the shortest at the back. Who is third in the line?'* 

Teaching point 3:

Each of the numbers one to five can be partitioned in different ways.

Steps in learning

<table>
<tr><th></th><th>Guidance</th><th>Representations</th></tr>
<tr><td>3:1</td><td>Now explore each of the numbers one to five individually, and in particular the different ways each can be partitioned. The number one can't be partitioned into two non-zero, whole number parts, so begin with the number five. Work through the full progression for partitioning five (steps 3:2–5:2), before repeating the whole sequence for four, and so on.</td><td></td></tr>
<tr><td>3:2</td><td>Using both concrete and pictorial representations, provide examples depicting careful arrangements of five items that can be subitised, for example:
• boxes stacked in different ways
• cakes with and without cherries
• a group of children – some sitting, some standing
To direct children's attention to the 'quantities within quantities', ask children questions such as 'What numbers can you see?' Encourage children to describe the contexts in full sentences, enumerating both of the parts and the whole. As you discuss different contexts, draw part–part–whole cherry representations, relating each number in the context to the numbers in the part–part–whole diagram.
Children should already be very confident with the part–part–whole cherry representation (see segment 1.2 Introducing 'whole' and 'parts': part–part–whole). Here the focus is on developing fluency in partitioning the</td><td>Partitioning into two parts:
'What numbers can you see?'

'I can see five flags. Three are spotty and two are stripy.'


• 'The 5 represents the total number of flags; the 3 represents the number of flags with stripes; the 2 represents the number of flags with dots.'
• 'Five is the whole; three is a part and two is a part.'</td></tr>
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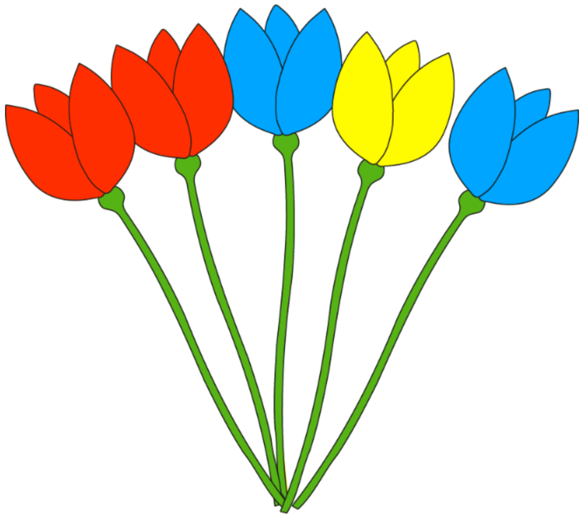
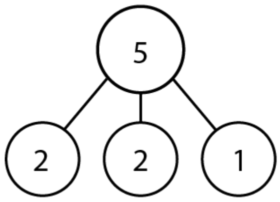
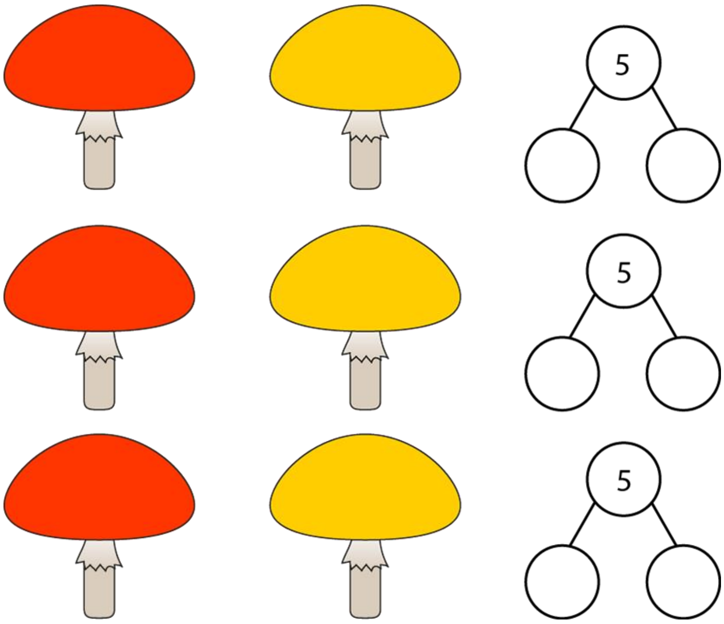
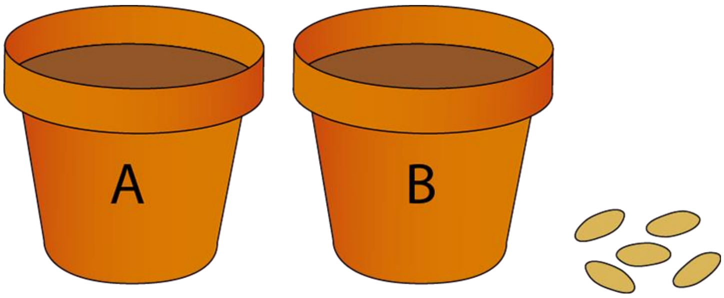
	numbers one to five, using subitising to recognise parts quickly.	
3:3	Ask children to draw their own cherry models to represent different contexts shown or described, for example, ‘*There are five sheep. Four sheep are black and one sheep is white. Draw this on a part–part–whole diagram.*’ Throughout this and the previous step, also include examples where the items are partitioned into more than two parts, such as: • a bunch of five flowers of three different colours • ‘*I have one spoon, two forks and two knives. I have five pieces of cutlery.*’	Partitioning into three parts:  ‘*There are five flowers. Two are red, two are blue and one is yellow.*’  ‘*Five is the whole; two is a part, two is a part and one is a part.*’
3:4	Now present contexts that allow children to explore different partitioning of a single set of items into two parts. Highlight the fact that a given number can be partitioned in different ways. Before children work on this independently, draw attention to cases where one of the ‘parts’ is zero (for example, all five spots are on one mushroom) so that children are prompted to include this in their own representations. In this case, draw the cherry model with 0 to show this, but avoid describing zero as a ‘part’. There is no need for children to work systematically at this stage, though some children may; for others, there will be repetition within their answers,	

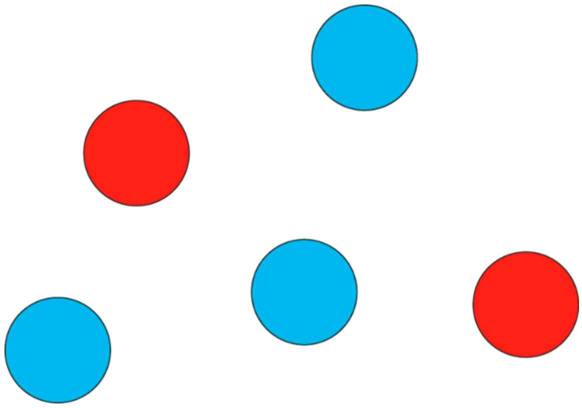
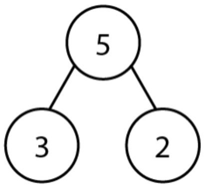
	and this is fine. Draw attention to the recurring partitioning options, for example *'Look, we've got a three and a two again.'* Give children practice completing part–part–whole cherry diagrams for each solution they find. Remember that children ultimately need to be fluent in partitioning facts for all numbers to ten. Take opportunities all through this segment to develop that fluency for the numbers to five.	*'There are a total of five spots on the mushrooms. Find different ways to split them between the two mushrooms.'* 

3:5	To promote and assess depth of understanding use a dòng nǎo jīn question, such as:
	• *'There are two plant pots and five seeds. The gardener puts more seeds in Pot A than Pot B.'*
	  • *'How many seeds might be in each pot?'*
	  • *'How many seeds cannot be in Pot A?'*
		'Pot A has more seeds than Pot B. There are five seeds altogether.'
		
		
		• *'How many seeds might be in each pot?'*
		• *'How many seeds cannot be in Pot A?'*

Teaching point 4:

Each of the numbers one to five can be partitioned in a systematic way.

Steps in learning

	Guidance	Representations
4:1	Now begin to look systematically at the different ways a given whole number can be partitioned into two parts. In this step, use 'double-sided' counters – counters whose two sides are distinguishable. The two sides could be different colours (as exemplified here), but if some children in the class have colour-vision deficiency, use a different method to distinguish between the sides (such as placing a sticker on one side). Give each child/pair five double-sided counters. Ask children to arrange their own group of counters, deciding for themselves how many to show as red and how many to show as blue. As a class, record the different ways that the children have partitioned the counters, for example: • *'Maisie has these colours.'* • Draw out the related image, rearranging the counters into a line. • *'Does anyone else have the same?'* • Draw out the part–part–whole cherry representation of the partitioning. Work through the different combinations, in no particular order (we will move onto a systematic examination in the next step). Although unlikely, it doesn't matter if not all pairs arise at this stage. Some children may have all red or all blue sides showing. In this case, draw the cherry model with 0 to show this, but avoid describing zero as a 'part'. Also note that, for example, three red and two blue is different from three	Maisie's counters:  *'Maisie has these colours.'*  Part–part–whole cherry model:  • *'The 5 represents all the counters.'* • *'The 3 represents the three blue counters.'* • *'The 2 represents the two red counters.'*

blue and two red, but both can be represented by the same cherry model. Use the following stem sentences to help children explain which number represents which colour:

- ***'The 5 represents all the counters.'***
- ***'The ___ represents the ___ blue counter(s).'***
- ***'The ___ represents the ___ red counter(s).'***

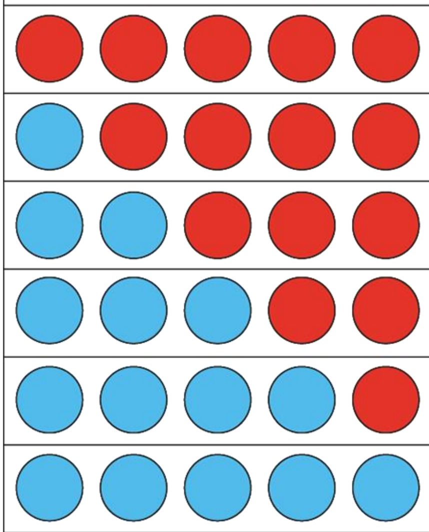
Again, draw children's attention to the recurring pairs: three and two, four and one, and five and zero.

4:2

Now ask children *'Can we be sure that we have all of the possible combinations?'* Then introduce the idea that we can work systematically to make sure we cover all possibilities.

Line up five double-sided counters, and systematically flip one at a time. Record each different combination in a table or with a part–part–whole cherry model.

The image opposite summarises all the possible combinations; review this summary with children after working through each example.

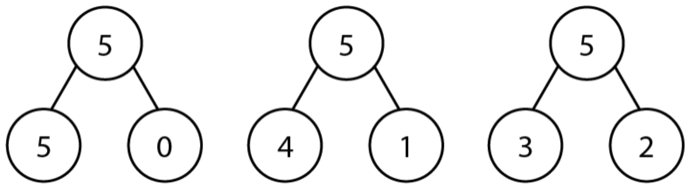


	Blue	Red
	0	5
	1	4
	2	3
	3	2
	4	1
	5	0

4:3

Summarise by identifying the three different number pairs which make five. Add the three cherry representations to a classroom display so that children can refer to them throughout the segment. It is vital that children become fluent in these pairs such that, given the whole and one part, all children know what the other part is.

Provide some opportunity for children to practise spotting these pairs, for example, playing 'snap' with number cards zero to five – children say *'snap'*



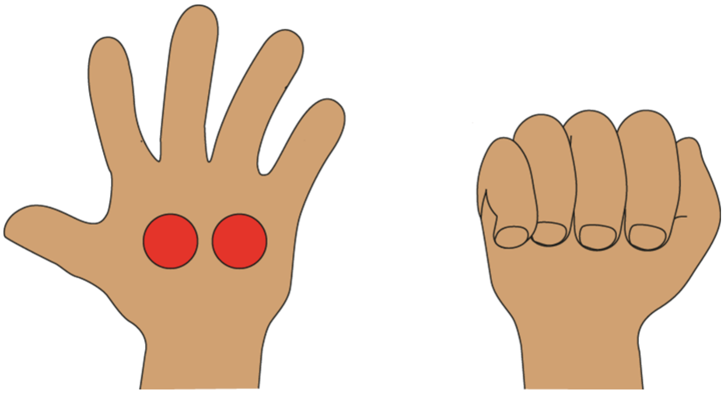
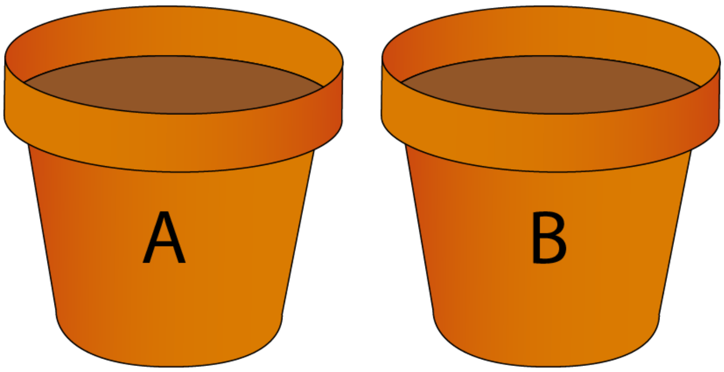
	each time a pair is turned up which totals five. Children should keep referring to the part–part–whole diagrams on display to check that their pairs do total five.	

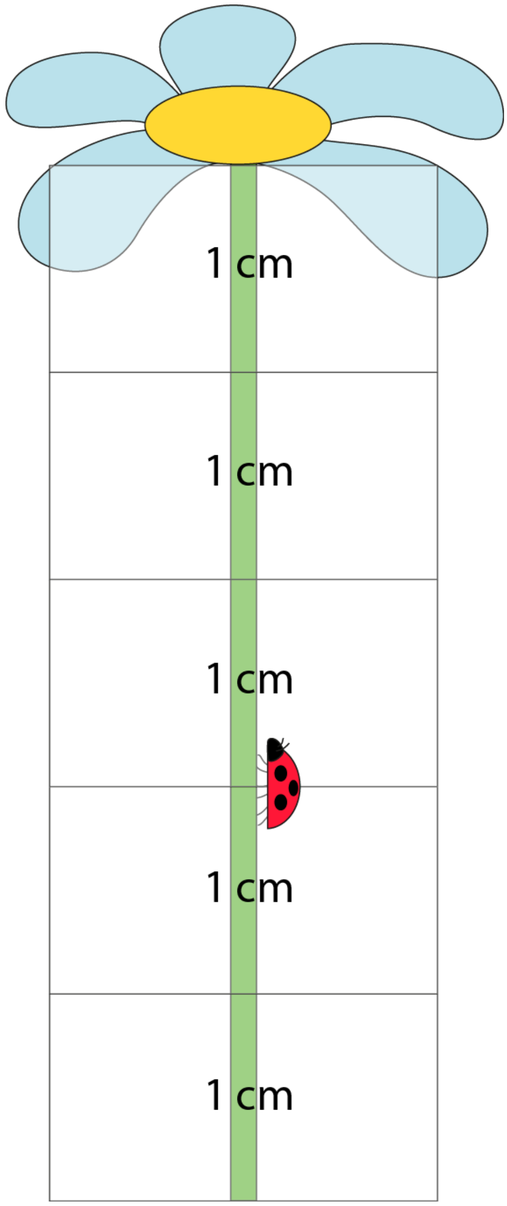
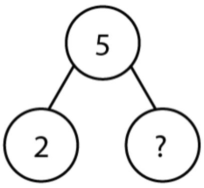
Teaching point 5:

Each of the numbers one to five can be partitioned into two parts; if we know one part, we can find the other part.

Steps in learning

	Guidance	Representations

5:1	By this stage, children should be fluent in subitising and partitioning. Now, present opportunities for children to apply these skills to find missing 'parts'. Essentially children will be *subtracting* a part from the whole, but at this stage do not use the term 'subtraction' (or take away or difference), and do not use the subtraction symbol (this is introduced in segment *1.5 Additive structures: introduction to aggregation and partitioning*).
	
	Begin by using a range of concrete and pictorial contexts for which one of the parts is missing or unknown. As well as asking children to identify the missing part, develop their reasoning skills by asking '*What could the missing part* not *be?'* and encouraging them to explain their answers. In both cases, children should describe the contexts in full sentences.
	
	Remember to include cases where:
	• the known 'part' is zero
	• the missing 'part' is zero
	• the context relates to measures or the relative value of numbers
	• the parts are not visual, for example:
	  ◦ *'I am going to clap five times.'*
	  ◦ Clap once.
	  ◦ *'How many more times do I need to clap?'*
	
	Children can use the part–part–whole representations on display (step *4:3*) for support if they still need this scaffold; however, the aim is for all children to be able to solve contextual and
		Concrete:
		'I have five counters. There are two counters in my open hand. How many counters are there in my closed hand?'
		
		'There are five counters altogether. Two are in the open hand, so there must be three in the closed hand. I know this because five can be partitioned into two and three.'
		
		Pictorial:
		'There are five seeds altogether. Four of the seeds are in Pot A. How many are in Pot B?'
		
		
		Story:
		'There are five children. One child has a carton of milk. How many do not have a carton of milk?'

	abstract missing part problems without referring to the diagrams by the end of the segment.	Measures context: *'A flower is five centimetres tall and the ladybird is two centimetres up the flower. How much further does the ladybird need to go to get to the top?'* 
5:2	Use the part–part–whole cherry representation in the following ways: • Encourage children to use the representation to record and justify their answers to contextual problems. • Present abstract, non-contextual problems using these representations.	 *'The whole is five and one part is two, so the other part must be three.'*

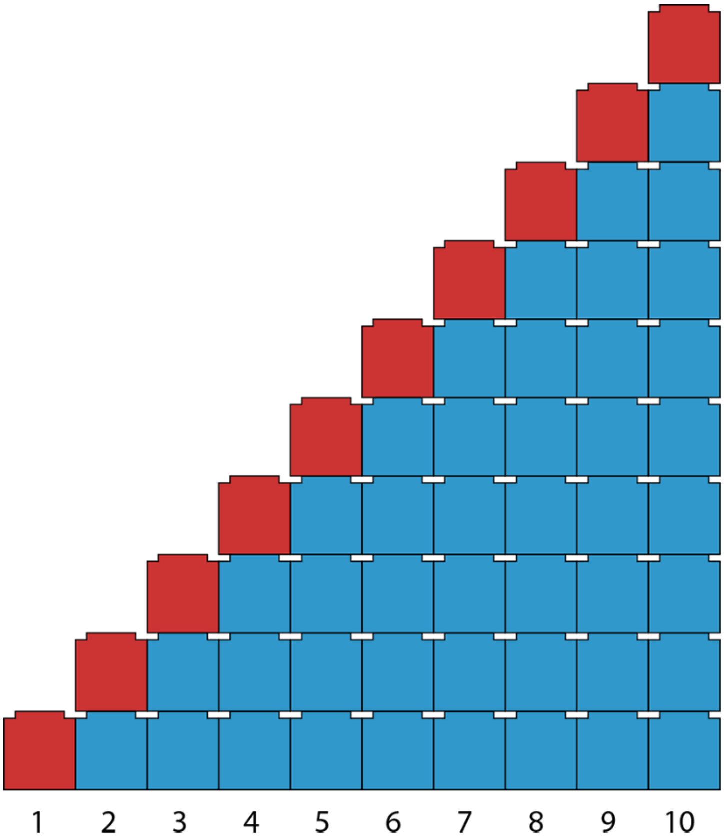
	Use a stem sentence of the form: ***'The whole is ___ and one part is ___, so the other part must be ___.'***	
5:3	Repeat steps *3:2–5:2*, focusing on partitioning four, then three and so on. As you get towards the smaller numbers there are fewer combinations, and you may be able to move more quickly through the teaching points. Ensure that you plan a variety of contexts and use a range of representations. Throughout, continue to: • encourage children to initially use subitising (rather than counting) to quickly recognise parts • keep the focus on fluency in partitioning the numbers, ultimately working towards children being able to partition quickly and confidently without relying on visual images.	

Teaching point 6:

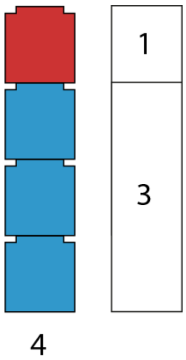
The number before a given number is one less; the number after a given number is one more.

Steps in learning

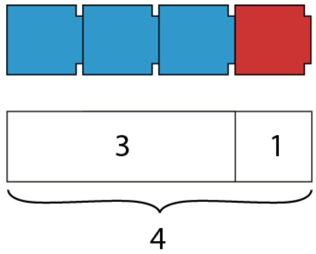
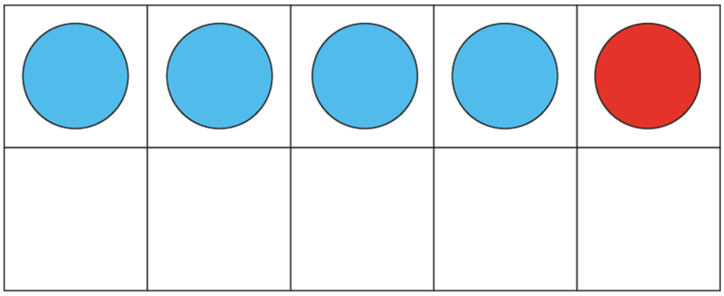
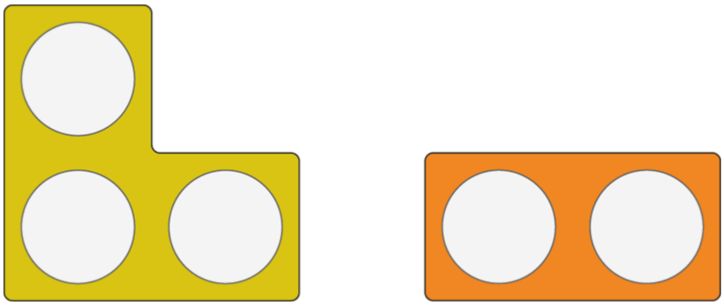
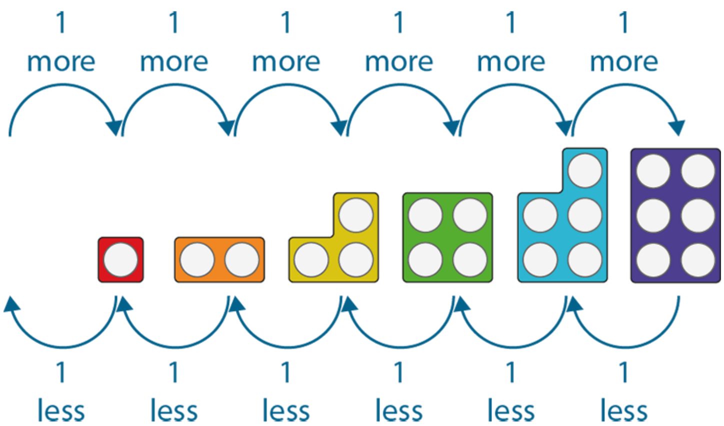
	Guidance	Representations
6:1	Return to the multilink staircase used in step *1:1*, now using two different colours of multilink to highlight that each number is 'one more' than the previous number. Isolate columns from the staircase and encourage children to describe what they see, in full sentences, and to make links to previous work on the partitioning of the numbers one to five. Remember to explore one: *'One is one more than zero.'* Here you can start to make links to the bar model, which will be introduced in *Teaching point 7*.	Multilink staircase – one more/less:



Multilink – comparing consecutive numbers:



- *'Four is made up of three and one more.'*
- *'Four is one more than three.'*

		
6:2	Using the multilink tower, and other varied representations (such as counters on tens frames or base-ten number boards), start to explore 'one less' as well. Ask children to describe the consecutive number pairs in full sentences. Eventually move towards the generalised statement: ***'The number before a given number is one less; the number after a given number is one more.'*** You can put the full multilink staircase back together to help emphasise the generalised statement.	Counters and tens frames:  • *'Four is one less than five.'* • *'Five is one more than four.'* Base-ten number boards:  • *'Two is one less than three.'* • *'Three is one more than two.'*
6:3	Now explore the idea that 'movement is magnitude': • As we move up/forwards through the counting sequence, the quantity increases by one. • As we move down/backwards through the counting sequence, the quantity decreases by one. Use the previous representations to demonstrate this, as well as introducing the number line – the latter will help you to ensure zero is included.	

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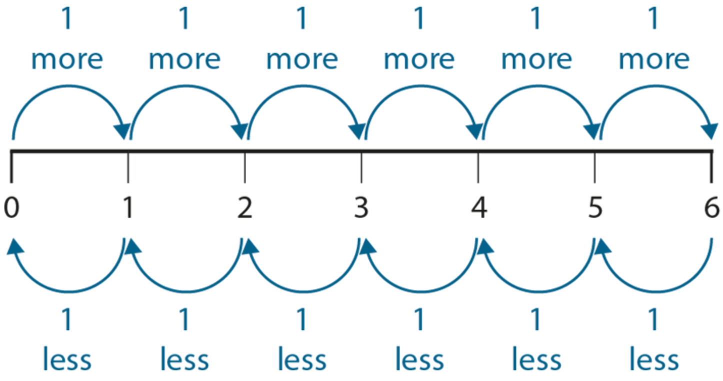
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<tr>
<td>6:4</td>
<td>Provide an opportunity for children to engage in varied fluency practice, encouraging them to use concrete or pictorial manipulatives to solve problems and justify the answers.
Examples of practice include:

completing one more/less sentences presented in different ways (missing numerals)
‘convince me’ problems; for example, ‘Convince me that:

two is one less than three
four is one more than three.’

real-world problems where the ‘answer’ cannot be seen; for example:

put four identical coins in a piggy bank so they cannot be seen
check the children know how many coins there are
take one out or put one more coin in and ask how many there are.

real-world problems that link to measure; for example, ‘I catch a train. It takes three hours to get to the first stop, then one more hour to get to my stop. How many hours does it take to get to my stop?’
</td>
<td>One more/less sentences – example one:

1 more than 3 is ☐

1 less than 2 is ☐

1 more than ☐ is 1

1 less than ☐ is 1

One more/less sentences – example two:

0 is 1 less than ☐

1 is 1 less than ☐

2 is 1 less than ☐

3 is 1 less than ☐

4 is 1 less than ☐

5 is 1 less than ☐</td>
</tr>
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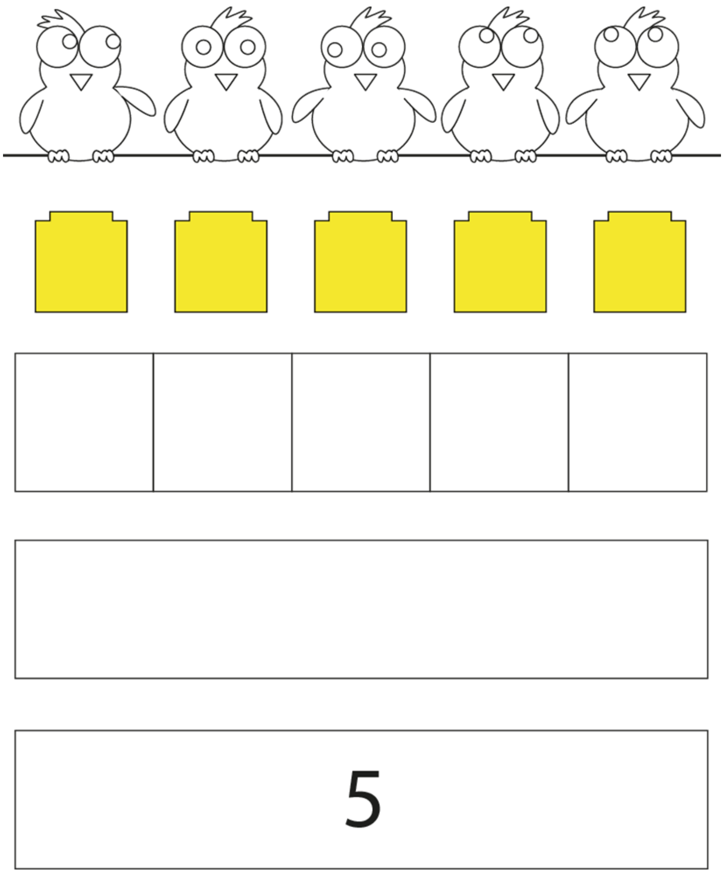
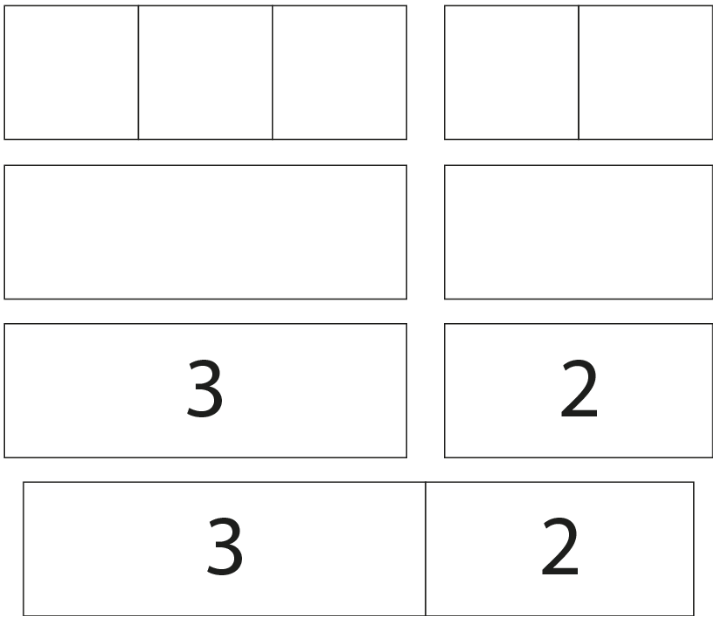
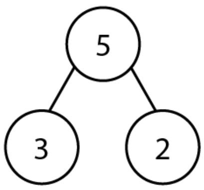
6:5	To complete this teaching point, you could use dòng nǎo jīn questions to promote and assess depth of understanding:
	• Using the number cards zero to five, how many different ways can you complete this:
	
	☐ is 1 less than ☐
	☐ is 1 more than ☐
	
	• *'Jan picks a number card showing 3 and records this sentence:*
	"Three is one less than two."
	Is she correct?'
	• '"One more than three is the same as one less than five."
	'Write another sentence like this.'
	• *'Can I use the same number to fill both gaps? Explain why or why not.'*:
	  • One more than ___ is one.
	  • One less than ___ is one.
	• *'Chloe is one year older than Seb. Seb is one year older than Adlar. Adlar is two years old. How old is Chloe? Who is the oldest? Explain your answers.'*	

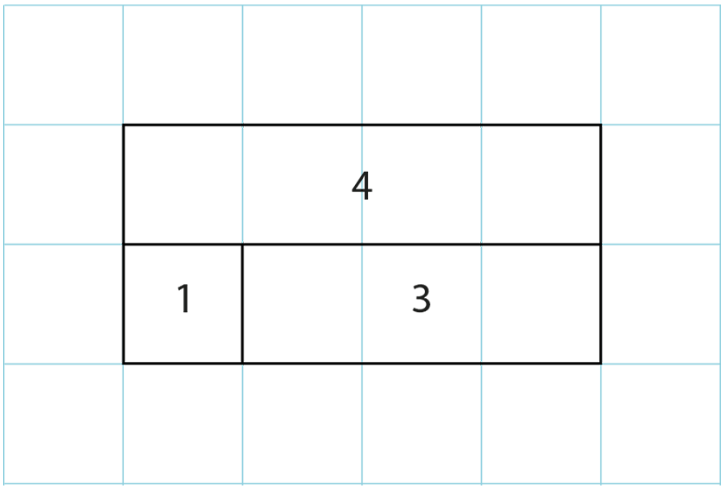
Teaching point 7:

Partitioning can be represented using the bar model.

Steps in learning

	Guidance	Representations
7:1	Now that children have developed some fluency in partitioning the numbers to five, you can use this number set to introduce the bar-model representation of part–part–whole as an alternative to the cherry model. Children will already have had some exposure to the concept of bars whose lengths are proportional to the numbers they represent – see step *6:1* above. Now, combine this idea with the concept of parts and wholes. Begin by working towards a bar that represents a chosen whole. Use multilink cubes alongside a pictorial representation, then progress to simple drawn squares and finally remove the dividing lines between the squares to leave the bar. Use the now-familiar stem sentence to help children make links to what they have already learned about partitioning: ***'There are ___ objects. ___ is the whole.'*** At each step, ask children to describe what the cubes/squares/bar represent.	*'There are five birds. Five is the whole.'* 
7:2	Now follow the same process, but with partitioning of the whole. Continue to: • use familiar stem sentences, for example: ***'There are… and…. ___ is a part. ___ is a part.'*** • ask children to describe what the cubes/squares/bars represent.	

		'There are three red birds and two blue birds. Three is a part. Two is a part.'   
7:3	Now combine the bars to form the full bar model. Show it alongside the cherry representation and, to help children make links, ask: • *'What's the same?'* • *'What's different?'*	 
7:4	Use the bar model to represent all of the different ways of partitioning your chosen number. It will become clear that the bar model provides different visual information – the 'parts' are now drawn proportionally. Help children to see this by continuing to link each bar model to the counters it is representing.	

	Note that the bar model isn't useful for representing cases where one of the 'parts' is zero.	
7:5	Set children some practice representing different partitioning of numbers to five using the bar model. They should be able to confidently move between a context (story, concrete or pictorial), the cherry model and the bar model. Children can use squared paper to make it easier to draw the bars; however, at this stage it isn't crucial if children aren't able to draw an accurate proportional bar model. There will be situations later on where you or the children simply need to sketch a quick bar model as a tool to solve a problem – in these cases, using a non-proportional bar model is equivalent to using the cherry model.	Using squared paper:  Non-proportional bar model: