Spring Block 3

Place value (within 50)

Small steps

Step 1	Count from 20 to 50
Step 2	20, 30, 40 and 50
Step 3	Count by making groups of tens
Step 4	Groups of tens and ones
Step 5	Partition into tens and ones
Step 6	The number line to 50
Step 7	Estimate on a number line to 50
Step 8	1 more, 1 less

Count from 20 to 50

Notes and guidance

In this small step, children count forwards and backwards between 20 and 50

Chanting games, such as "I count, you count", give children the opportunity to count from different starting points alongside their peers.

Number tracks and half-hundred squares are useful representations to support children counting up to 50. When counting on a half-hundred square, ensure that they recognise the convention of moving to the next row after reaching a multiple of 10

Things to look out for

- As children have become familiar with teen numbers, they may use these interchangeably with multiples of 10, for example saying "thirteen" instead of "thirty".

- When counting backwards from a multiple of 10, children may start going forwards again, for example 42, 41, 40, 41

- Children may reverse the digits of 2-digit numbers, for example writing "41" as "14".

Key questions

- What number comes next?

- What number comes after _____?

- Will you say the number _____ when counting from _____ to _____?

- What numbers sound similar?

- What number comes before _____?

Possible sentence stems

- The number that comes after _____ is _____

- The number that comes before _____ is _____

- I will/will not say the number _____ , because ...

National Curriculum links

- Count to and across 100, forwards and backwards, beginning with zero or 1, or from any given number

- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least

Count from 20 to 50

Key learning

Divide children into groups.

As you point to a group, they begin counting from 1. When you point to another group, they continue the count. Keep switching between groups.

To increase the challenge, point upwards when you want children to count on from the last number counted and point down for them to count back.

Using a puppet, model counting forwards or backwards from 20 to 50 with deliberate mistakes, such as saying "fourteen" instead of "forty" or not continuing in the correct direction after counting a multiple of 10

Ask children to help the puppet to count correctly.

Encourage children to collect more than 20 natural objects. Discuss how lining the objects up can make them easier to count.
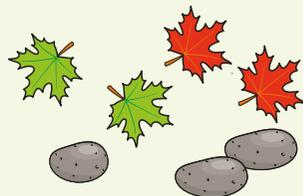
Put children in pairs and give them a half-hundred square.

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

Ask children to take it in turns to count forwards or backwards from a given number.

While one child counts aloud, their partner checks by moving their finger on the half-hundred square. They then swap roles.

- Complete the number tracks.

40	41	42	43						

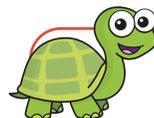| 32	31	30							

Count from 20 to 50

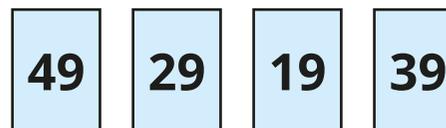## Reasoning and problem solving

Complete the number track.

				19	20	21			

15, 16, 17, 18, 22, 23, 24

Tiny counts up from 24 to 40

Which of the numbers will Tiny say?

49 **29** **19** **39**

29, 39

Jo is counting.

28, 29, 30, 13, 32

What mistake has she made?

Jo has reversed the digits when writing 31

Ron is counting back from 43

43, 42, 41, 40, 41, 42

What mistake has Ron made?
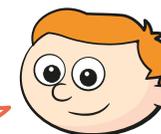
He has started counting forwards after counting 40

20, 30, 40 and 50

Notes and guidance

In this small step, children develop their understanding of multiples of 10 up to 50

Recap learning from Spring Block 1 about the equivalence of 10 ones and 1 ten using representations such as a ten frame or a bundle of 10 straws.

There are several representations that can be used in this step to highlight how many tens are in each number, for example ten frames, base 10, bead strings and towers of cubes. Give children practical opportunities to explore each number in different ways using a range of concrete resources. Children could move on to seeing e.g. 20 as two base 10 pieces that cannot be broken apart, although the individual ones are still obvious.

Things to look out for

- Children may count groups of 10 as discrete objects rather than groups of objects, for example counting 4 packs of 10 pencils as "4 pencils".

- Children may not recognise that 40 is greater than 39, because they are looking at the digit in the ones place value position instead of the tens.

Key questions

- Is this a group of ten? How do you know?

- How many ways can you make _____?

- How many ones make 30?

- How many tens make 30?

- If you have 3 full ten frames, what number have you made?

- How many base 10 pieces make 50?

Possible sentence stems

- _____ ten frames are full, so I know that I have made _____

- There are _____ ones in _____

- There are _____ tens in _____

National Curriculum links

- Count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s

- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
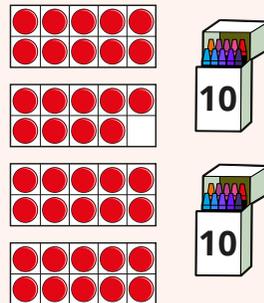
20, 30, 40 and 50

Key learning

Hide small objects outside and provide 5 ten frames for each group.

Each group collects objects to fill their ten frames. Prompt children to tell you how many they have found and how many groups of ten they have.

Show children representations of numbers, some of which show multiples of 10 and some of which do not.

Ask them to decide if the number shown is a multiple of 10 and to explain how they know.

Read the book *One is a Snail, Ten is a Crab* by April Pulley Sayre and Jeff Sayre.

30 is 3 crabs or 10 people and 1 crab. Ask children why 3 crabs make 30

Children could draw crabs to show each multiple of 10

Put children into groups and give each group 5 ten frames.

Children take turns to roll a 6-sided dice. They put the corresponding number of counters on the ten frames. The first group to reach 50 (5 full ten frames) wins.

- Complete the table and continue the pattern.

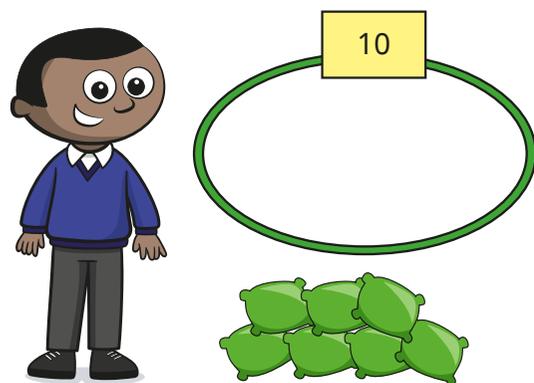| Base 10	Number	How many tens?
		1 ten
	20	2 tens

- Which pictures show 30?
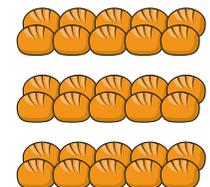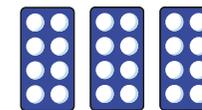
20, 30, 40 and 50

Reasoning and problem solving

Mo is playing a game.

10

He scores 10 points for every bean bag that lands in the hoop.

He scores 50 points in total.
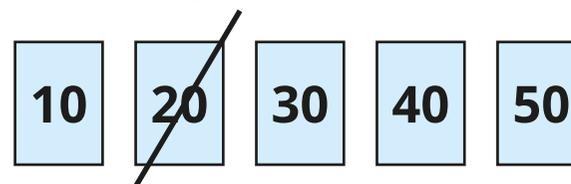
How many bean bags does Mo get in the hoop?

Ben scores 10 fewer points than Mo.

How many points does Ben score?

5

_____

40

How many ways can you show each number?

One has been done for you.

| 10 | ~~20~~ | 30 | 40 | 50 |

multiple possible answers

Count by making groups of tens

Notes and guidance

In this small step, children learn how to count objects more efficiently by grouping into tens and ones.

Children should spend time practically counting groups of ten from objects such as counters, cubes and straws. Building towers of 10 cubes or bundling 10 straws will reinforce the concept of 1 ten being equal to 10 ones.

After grouping objects into tens practically, children practise counting pictures of objects and circling each group of ten.

It is important that children recognise that a 2-digit number is formed by counting the number of groups of ten for the first digit and the ones left over as the second digit.

Things to look out for

- Children may not correctly group objects into tens.

- Children may reverse the digits in a 2-digit number.

- Children may not generalise that the group of 10 objects is equal to 1 ten, which can lead to them counting, for example, 3 bundles of 10 straws and 4 extra straws as 7

- Children may write 2-digit numbers incorrectly. For example, if there are 3 tens and 4 ones, they may write this as 304 rather than 34

Key questions

- How many _____ are there?

- How did you count them?

- Is there an easier way to count the objects?

- How can you make sure you do not miscount any objects?

- How could you use a ten frame to help you count groups of ten?

- How many ones are there in 10?

- How many groups of ten are there and how many more?

Possible sentence stems

- _____ ones = _____ ten(s)

- There are _____ groups of 10 and _____ more. There are _____ in total.

National Curriculum links

- Count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s

- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least

Count by making groups of tens

Key learning

Using a puppet, model counting a large number of objects, such as 36 cubes.

Lose count or double count cubes to show the inefficiency of counting in ones.

Ask children if they can think of a better way to count.

Model counting 10 cubes and putting them in a group.

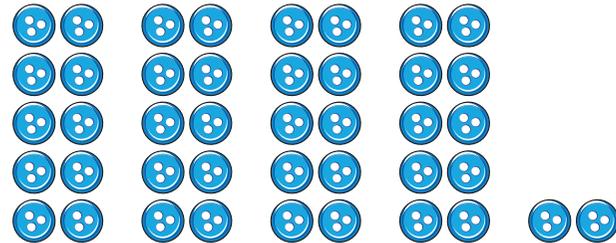Continue grouping the rest of the cubes into tens.

Give children a large number of objects.

Ask them to count by grouping into tens and ones.

Draw attention to different ways the children have grouped the sets of 10 objects, such as stacking, making arrays, putting into piles.

Discuss whether this affects the value of the 10 objects.

• Complete the sentences.

There are _____ groups of ten buttons and _____ buttons.

There are _____ buttons in total.

• Circle groups of 10 to count how many frogs there are.
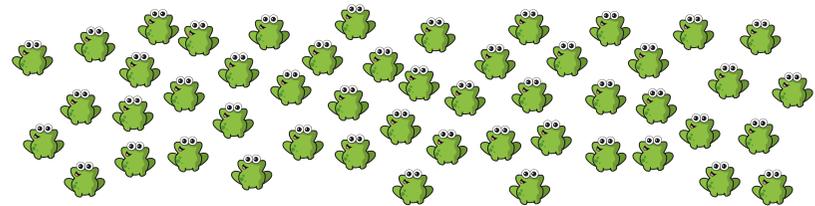
• Ann and Fay are counting straws.
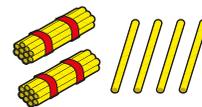
Ann   **Fay**
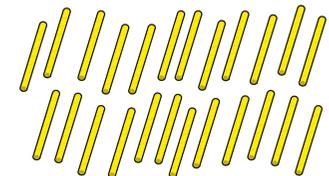
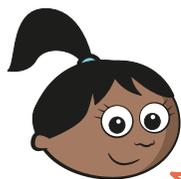What is the same? What is different?

Count by making groups of tens

Reasoning and problem solving
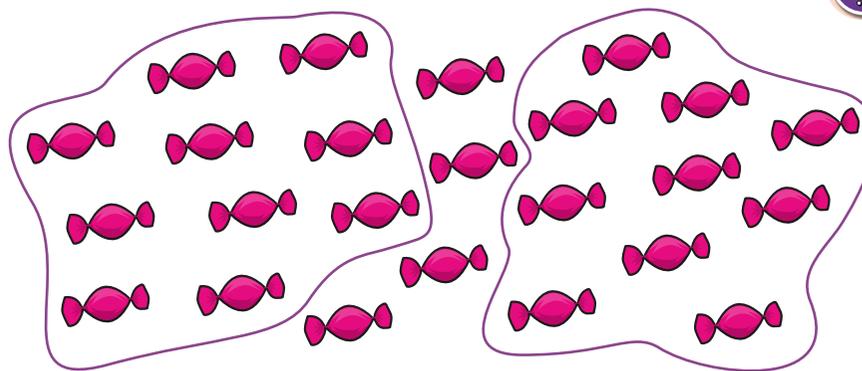
Sam counts by grouping 10 buttons.
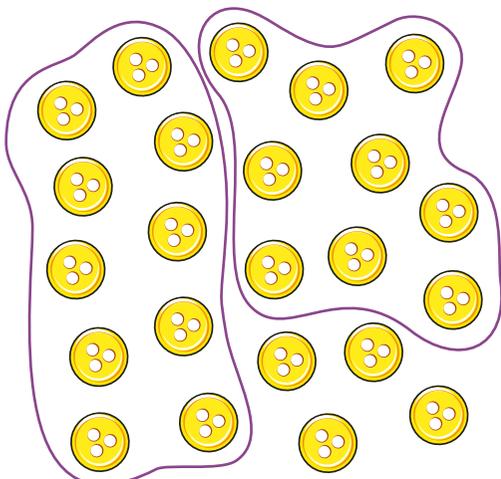
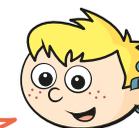I have 2 tens and 4 ones, so I have 24 buttons.

What mistake has Sam made?

How many buttons are there?

23

Max is counting sweets.

I have 2 groups of 10 sweets and 4 sweets, so I have 42 sweets.

What mistake has Max made?

How many sweets does Max have?

24

Groups of tens and ones

Notes and guidance

This small step consolidates children's place value understanding of tens and ones.

Children continue to describe a number by the number of tens and ones the number is made from. Learning from the previous step is extended, as the representations of the tens and ones are not always in place value order.

Children need to count the number of groups of 10 and then the ones to find the total. All the representations still show that 10 ones make 1 ten, and children could still count individual ones to find the total. However, this is not efficient, so if children are still doing this, encourage them to recognise the groups of 10. Using base 10 is useful, as it gives children no option other than to count tens and ones, since they cannot split the ten apart.

Things to look out for

- Children may count the number of objects, rather than consider what each object represents.
- Children may reverse the digits of the 2-digit number, particularly if the representation is not organised in place value order.

Key questions

- How many _____ are there? How do you know?
- How many groups of ten are there? How many more are there?
- How many ones are there in 10?
- How many tens are there? How many ones?
- How many _____ are there in each pack/box?

Possible sentence stems

- There are _____ groups of 10 objects and _____ more objects.
  There are _____ objects in total.
- I have _____ tens and _____ ones.
  I have _____

National Curriculum links

- Count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s
- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
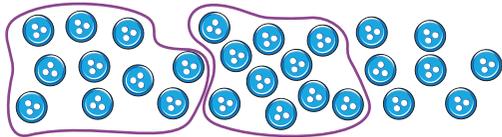
Groups of tens and ones

Key learning

Show children 37 on ten frames.

What do they notice about 37?

Get children to say out loud, "37 has 3 tens and 7 ones."

Ask children to build 38 and 39 and talk to a partner about what they notice.

Explore other numbers to 50, getting children to verbalise how many tens and ones make up the number.

- How many buttons are there?

There are _____ groups of 10 buttons and _____ more buttons.
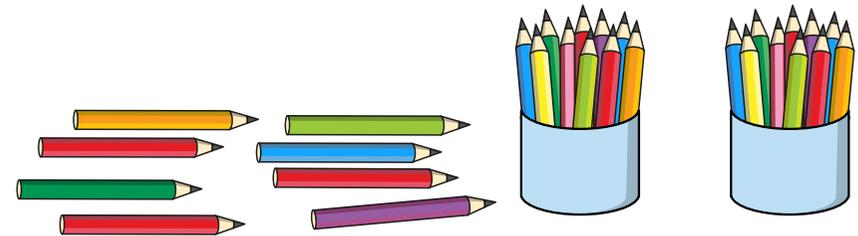
There are _____ buttons in total.

- How many flowers are there?

There are _____ groups of 10 flowers and _____ more flower.

There are _____ flowers in total.

- Kay counts pencils by grouping them in tens.

How many pencils are there?

- How many counters are there?
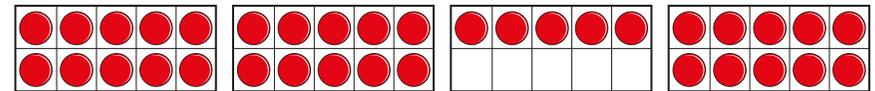
Ask children to make a number up to 50 using base 10, without showing their partner.

Children should tell their partner how many tens and ones their number has.

Then their partner draws the number.

They check to see whether the drawing matches their number.

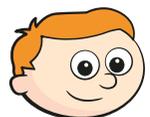# Groups of tens and ones

Reasoning and problem solving

Kim and Ron are making the same number.

Kim's number has these tens.
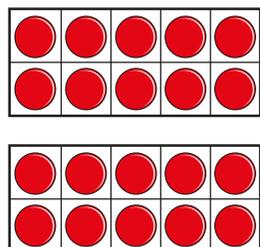
Ron's number has these ones.

What number are Kim and Ron making?
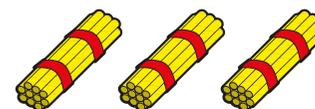
How do you know?

23

Dan counts straws by grouping them in tens.

He has grouped as many tens as he can.

He has some ones left.

How many straws could Dan have in total?

between 31 and 39

Mo has some cubes.

He wants to count them by making tens.

I cannot make a group of 10

How many cubes might Mo have?

between 1 and 9

Partition into tens and ones

Notes and guidance

In this small step, children develop their understanding of place value for 2-digit numbers as they begin to partition numbers to 50. They have already explored how many tens and ones make a number and they now use a part-whole model to partition a number into tens and ones.

Children first investigate partitioning with representations, followed by numbers. It is important that they see that the whole can be partitioned into tens and ones or ones and tens. The value of the whole and each part does not change in either order.

At this stage, children do not need to describe the part-whole model as an addition number sentence.

Things to look out for

- Children may partition a number into its digits, rather than considering the value of each digit, for example stating that 32 is made up of 3 and 2

- When the parts of a part-whole model are "the wrong way round", children may interpret the whole incorrectly.

- Where part-whole models are presented in different orientations, children may not correctly identify the whole.

Key questions

- How many tens are there? How many ones are there? What is the number?

- What is the whole? What are the parts?

- Does it matter which way round you draw the parts?

Possible sentence stems

- There are _____ tens.

  There are _____ ones.

  The number is _____

- _____ is the whole.

  _____ is a part and _____ is a part.

National Curriculum links

- Count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s

- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
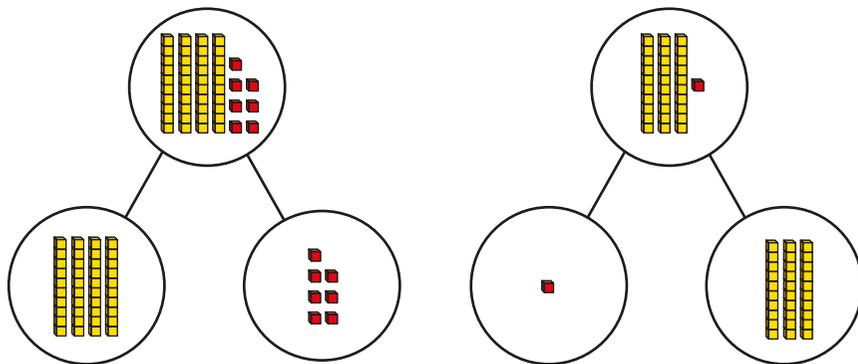
Partition into tens and ones

Key learning

Read *Count to 100* by Felicity Brooks.

Give children a picture of up to 50 birds.

Can they partition the birds into tens and ones?

- Complete the sentences to describe each part-whole model.

  ▶ _____ is a part and _____ is a part.

  _____ is the whole.

  ▶ There are _____ tens.

  There are _____ ones.

  The number is _____

  What do you notice?

Ask children to use base 10 to make the number 32 and then to use a part-whole model to partition the number into tens and ones.

Can they tell you how many tens and ones there are in 32?

Repeat with other numbers.

- How does the part-whole model match the base 10?
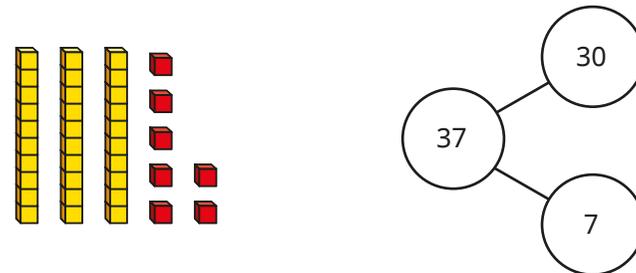
- Use a part-whole model to partition each number into tens and ones.

  | 41 | 22 | 36 | 17 | 50 |

Partition into tens and ones

Reasoning and problem solving

Jo, Max and Sam each show a number in a part-whole model.

Jo

Max
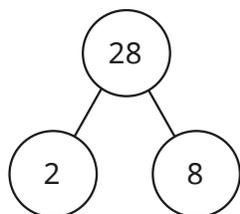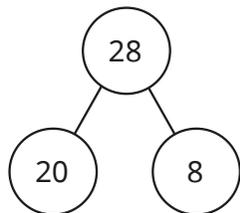
Sam
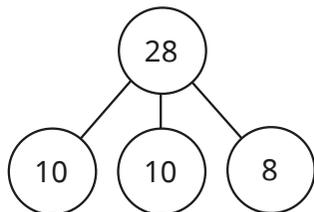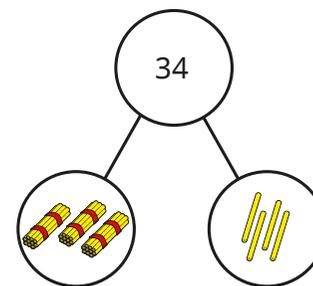
Who is correct?

How do you know?

Max and Sam

Kim and Ron use straws to show a number.

Kim

Ron

Who is correct?
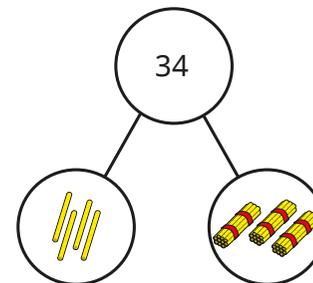
How do you know?

Both children are correct.

The number line to 50

Notes and guidance

Children have used a number line to count to 10 and 20 in previous blocks; in this small step, the number line is extended to include numbers to 50

Encourage children to explore the similarities and differences between a number track and a number line. There are lots of opportunities for practical activities within this step, such as children creating their own number line on the playground.

Children see examples of number lines with different start and end point values, as well as number lines between zero and 50 or between multiples of 10. They use their knowledge of counting to label number lines counting up in 1s before labelling number lines counting in 10s. Building on this, they find the position of given numbers on unlabelled number lines.

Key questions

- Where does the number line start?
- Where does the number line end?
- Where do the numbers go on a number line?
- How can you use a number line to decide which number is greater/less?
- How much is each jump on the number line?

Possible sentence stems

- The first number on the number line is _____
- The last number on the number line is _____
- The number line is going up in _____

Things to look out for

- Children may think that number lines can only go up in 1s.
- When labelling a number line, children may write the numbers in between divisions, as they do on number tracks, rather than on divisions.
- Children may assume that all number lines start from zero.

National Curriculum links

- Count to and across 100, forwards and backwards, beginning with zero or 1, or from any given number
- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
- Given a number, identify 1 more and 1 less

The number line to 50

Key learning

Use chalk to draw number lines with different start and end point values on the playground. Children practise starting on a given number and hopping to another number. Discuss which numbers they land on, and which ones they do not land on.

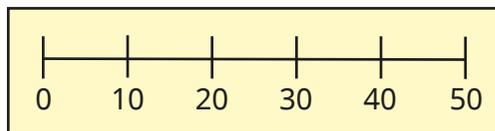Challenge children to use the number lines to find 1 more or 1 less than a given number.

Give six children a number from 25 to 30
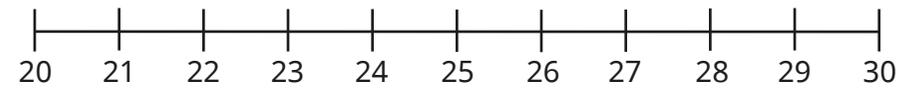
Ask them to order themselves into a number line.

What is the next number? What is the previous number?

- What is the same? What is different?

0	10	20	30	40	50

| 0 | 10 | 20 | 30 | 40 | 50 |

- Circle all the numbers on the number line that are less than 23

20 21 22 23 24 25 26 27 28 29 30

Circle all the numbers on the number line that are greater than 45

40 41 42 43 44 45 46 47 48 49 50

- Complete the number lines.

30 31 32   36   40

25 26 27   33   35
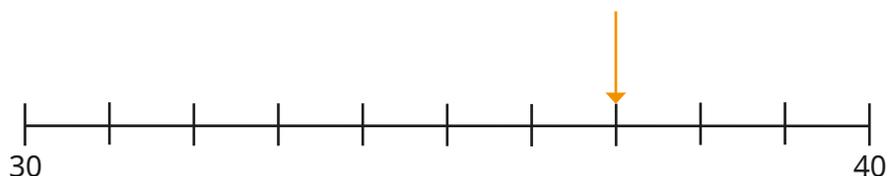
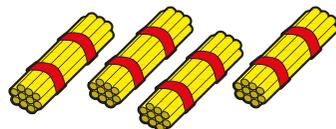0   10   50
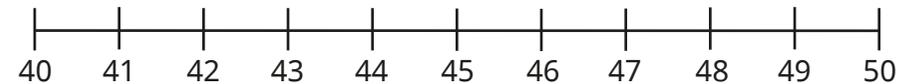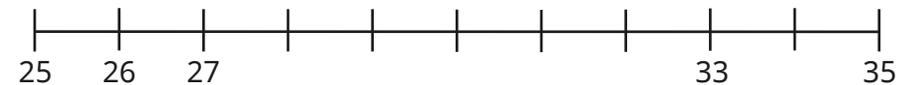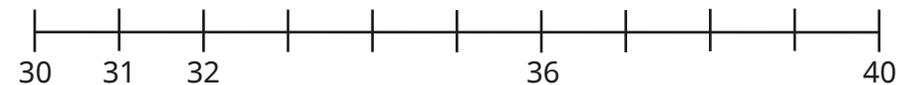
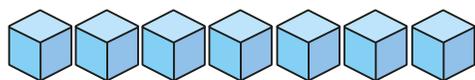What is the same about the number lines? What is different?
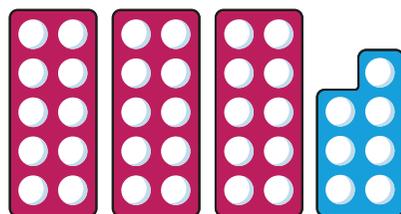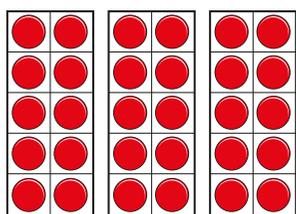
The number line to 50

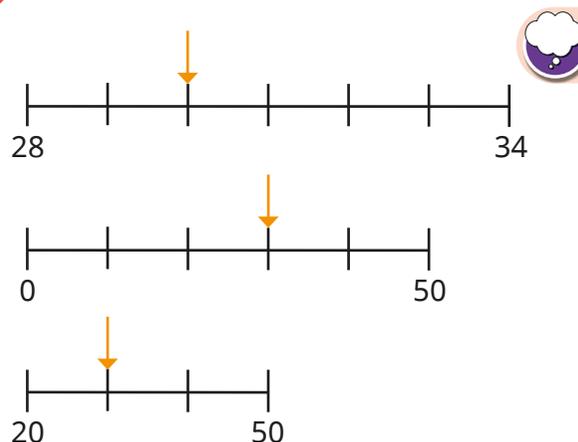## Reasoning and problem solving

Ben draws an arrow on the number line.

Which picture matches Ben's number?

37 (number pieces)

The arrows are pointing to the same number.

Sam

They are pointing to different numbers.

Mo

Who is correct?

Sam

Estimate on a number line to 50

Notes and guidance

Building on the previous small step, children estimate the positions of numbers on number lines up to 50

Children have estimated on number lines to 20, but they may need to recap the idea of an estimate being a "best guess". Remind them that estimates are not exact. Explore the process of finding a midpoint on a blank number line by asking what number is halfway between the start and end point numbers.

Discuss how that makes it easier to estimate the position of a number. After finding the midpoint, children can then position the number using proportional reasoning.

Things to look out for

- Children may position a number at the multiple of 10 on the number line, as they do not recognise that numbers can be between intervals.

- Children may think that they have an incorrect answer if their answer is slightly different from their partner's. As these are estimates, they could both be correct.

- Some children may find it difficult that there is not an exact answer when estimating.

Key questions

- What does "estimate" mean?

- Can you find halfway on the number line?

- What number is halfway between _____ and _____?

- Is _____ less than halfway or more than halfway? How do you know?

- Where is _____ on the number line? How do you know?

- Which two multiples of 10 is _____ between?

Possible sentence stems

- Halfway is _____

- _____ is here on the number line because …

- _____ is closer to _____, so it goes here on the number line.

National Curriculum links

- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least

Estimate on a number line to 50

Key learning

Use chalk to draw a line on the playground. Label one end 20 and the other end 30

Give a child a number card for 25 and ask them to position themselves on the number line, explaining their position. Discuss with the class whether they agree. Give another child a number card for 22. Discuss whether 22 is greater or less than 25. Why is this important? Give other children numbers to join the number line.

Ask what number would be halfway if the number line was changed to show 20 to 40
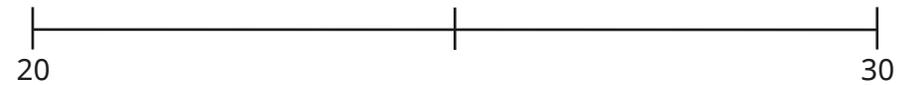
- Draw arrows to 4 and 9 on the number line.

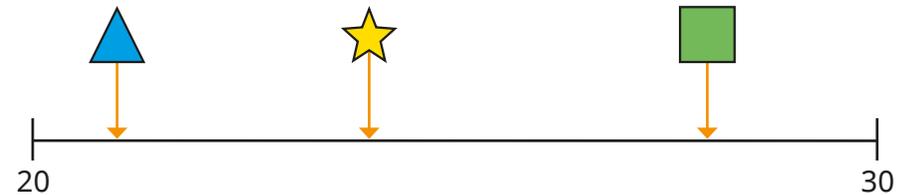Use your answer to help you estimate where 24 and 29 are on this number line.
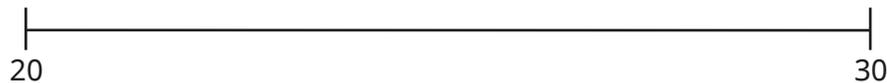
- Draw an arrow to 32 on the number line.
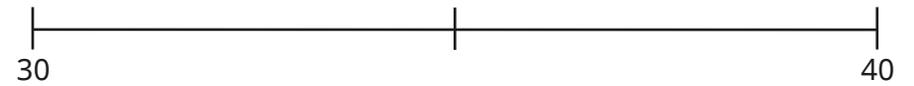
Draw an arrow to 28 on the number line.

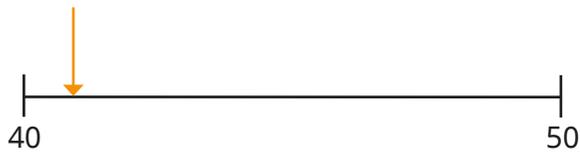- Here is a number line.

Match the shapes to the numbers.

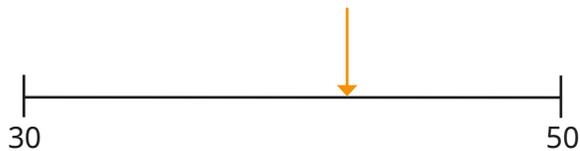| 24 | 21 | 28 |

Estimate on a number line to 50

Reasoning and problem solving

What number could the arrow be pointing to?

40 ——————————————— 50

e.g. 41

Ann draws an arrow on a number line to show a number.

30 ——————————————— 50

What could Ann's number be?

What can Ann's number **not** be?

Compare answers with a partner.

any number between 40 and 45

———————————

less than 40 or greater than 45

Tiny estimates where 28 belongs on the number line.

28

20 ——————————————— 30
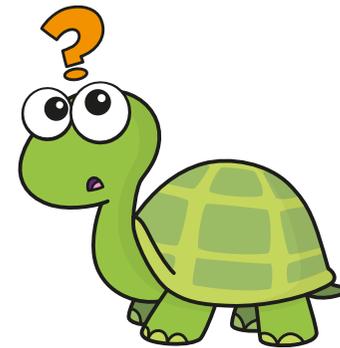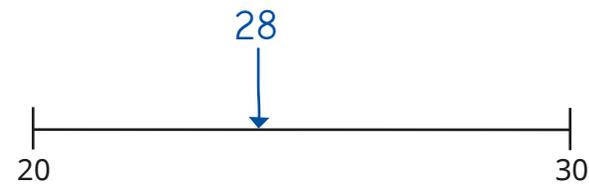
How do you know that Tiny is incorrect?

25 is the halfway point on the number line.

28 is greater than 25 so should be between halfway and 30

1 more, 1 less

Notes and guidance

In this final step, children apply their counting skills to find 1 more and 1 less than any number between zero and 50. They have already found 1 more and 1 less than numbers within 20 in a previous block.

As children are still developing their understanding of 2-digit numbers, it is important that they find 1 more and 1 less of a number using concrete resources and representations. Initially, they could make a number using a ten frame and counters, before working out 1 more and 1 less by adding or removing counters. Children could then use number lines alongside concrete resources to count forwards or backwards.

Things to look out for

- Children may find it difficult to find 1 less than a multiple of 10. For example, they may write "1 less than 40 = 49"

- When using base 10 to find 1 less than a multiple of 10, children may just subtract a ten, for example 3 base 10 ten pieces is 1 less than 4 base 10 ten pieces.

- When finding 1 more than a multiple of 10, children may add 10, for example 1 more than 30 = 40

Key questions

- How can you represent the number _____?

- How can you find 1 more?
  How does this change the number?
  Which digit changes? Why?

- How can you find 1 less?
  How does this change the number?
  Is it only ever the ones digit that changes?

Possible sentence stems

- _____ is 1 more than _____

- _____ is 1 less than _____

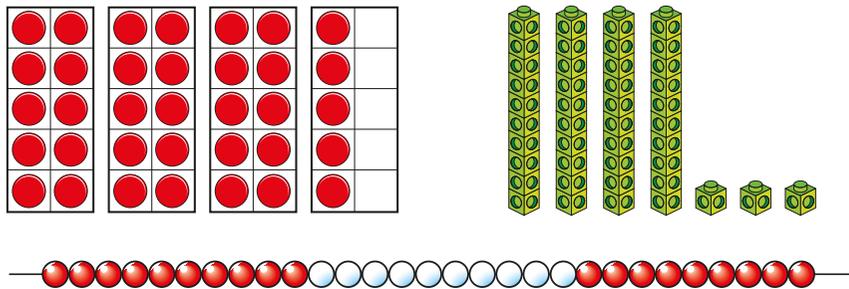- 1 more than _____ is _____

- 1 less than _____ is _____

National Curriculum links

- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least

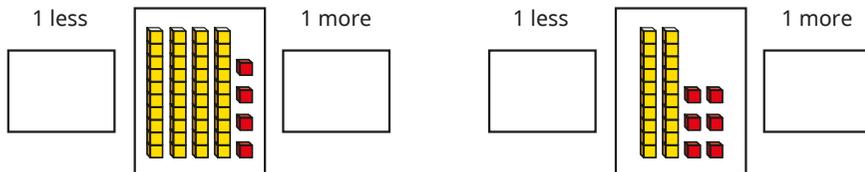- Given a number, identify 1 more and 1 less

1 more, 1 less

Key learning

- Make 1 more and 1 less than each number.
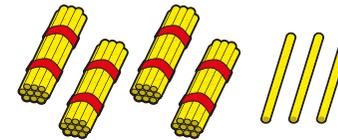

- Write numbers to fill in the boxes.

- Use the number track to fill in the missing numbers.

| 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |

- ▶ _____ is 1 more than 34
- ▶ 34 is 1 more than _____
- ▶ _____ is 1 less than 39
- ▶ 39 is 1 less than _____

- Dan has these straws.

- ▶ How many straws does Dan have?
- ▶ If Dan gives one straw away, how many straws will he have left?
- ▶ If Dan is given one more straw, how many straws will he have?

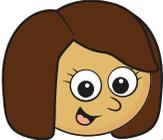- What is the same about each picture? What is different?

32 is 1 more than 31

1 more, 1 less

Reasoning and problem solving

Kim is thinking of a number.

My number has 3 tens.

1 less than my number makes the tens digit change.

1 more than my number has 1 one.

What is Kim's number?

30

Is the statement always true, sometimes true or never true?

When I find 1 more than a number, I only change the ones digit.

Talk about it with a partner.

sometimes true

Use the number cards to complete the sentences.

| 28 | 29 | 30 | 31 | 32 |

_____ is 1 less than _____

_____ is 1 more than _____

How many different ways can you find?

multiple possible answers, e.g.

28 is 1 less than 29

32 is 1 more than 31