

White

**Rose
Maths**

Autumn - Block 1

Place Value

Overview

Small Steps

- Count objects to 100 and read and write numbers in numerals and words
- Represent numbers to 100
- Tens and ones with a part-whole model
- Tens and ones using addition
- Use a place value chart
- Compare objects
- Compare numbers
- Order objects and numbers
- Count in 2s, 5s and 10s
- Count in 3s

NC Objectives

Read and write numbers to at least 100 in numerals and in words.

Recognise the place value of each digit in a two digit number (tens, ones).

Identify, represent and estimate numbers using different representations including the number line.

Compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs.

Use place value and number facts to solve problems.

Count in steps of 2, 3 and 5 from 0, and in tens from any number, forwards and backwards.

Count Objects to 100

Notes and Guidance

To build on skills learned in Year 1, children need to be able to count objects to 100 in words and represent these numbers in numerals.

Problems should be presented in a variety of ways e.g. numerals, words and images. Variation should challenge children by providing them with missing numbers which are non-consecutive.

Mathematical Talk

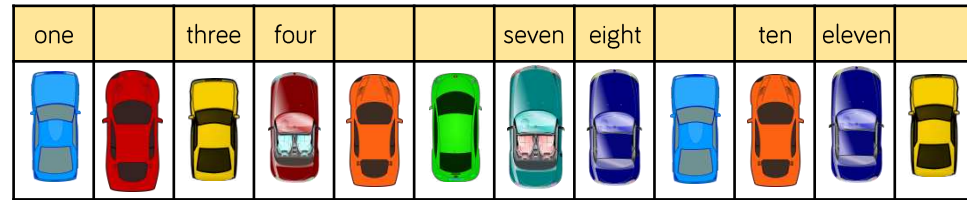
How can you count the cars?
Do you have a strategy?
What is one more/one less?

Which is the largest number?
Which number is tricky to write in words?

Which numbers sound similar?
How are 17 and 70 different? Can you show me?

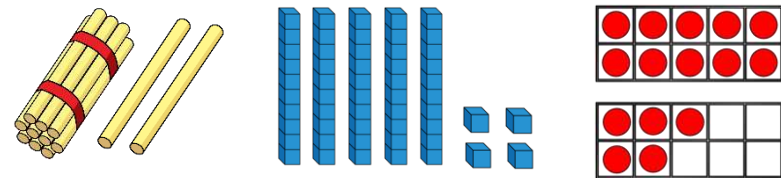
Varied Fluency

- Count and write the number of cars in the car park.



There are _____ cars in the car park.

- What numbers are represented below?
Write your answer in numerals and words.



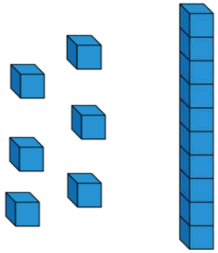
- Match the numerals to the words.



Count Objects to 100

Reasoning and Problem Solving

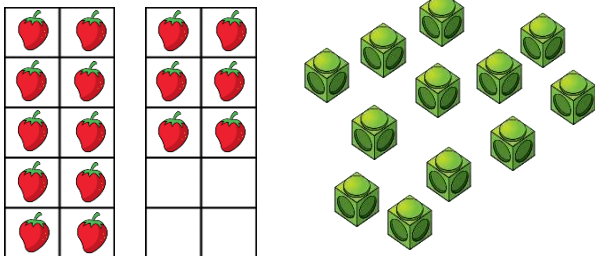
Jack says he has 61
Is he correct?



Explain your reasoning.

Jack is incorrect.
He has 16 not 61

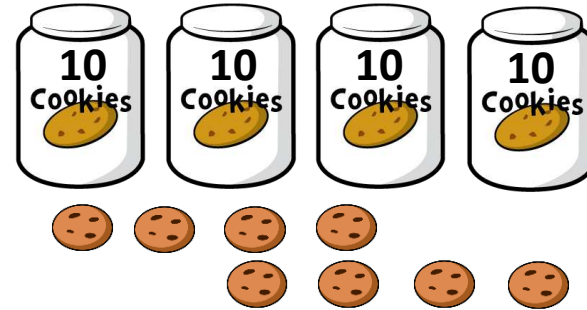
Here are two sets of objects.



Which are easier to count?
Explain your answer.

The strawberries
are easier to count
because they are
set out on ten
frames.

Each jar contains 10 cookies.



How many cookies are there altogether?

Write your answer in numerals and
words.

What strategy did you use?

Did your partner use a different method?

What is the best strategy to use?

There are 48
(forty-eight)
cookies altogether.

Children may
count in 10s and
1s or know that
there are 4 tens
which are equal to
40 and then count
on 8 more.

Represent Numbers to 100

Notes and Guidance

Children need to be able to represent numbers to 100 using a range of concrete materials, such as bead strings, straws, Base 10 equipment etc.

Children should also be able to state how a number is made up. For example, they can express 42 as 4 tens and 2 ones or as 42 ones.

Mathematical Talk

How have the beads been grouped? How does this help you count?

Can you show me the tens/ones in the number?

Which resource do you prefer to use for larger numbers? Which is quickest? Which would take a long time?

Varied Fluency

Here is part of a bead string.



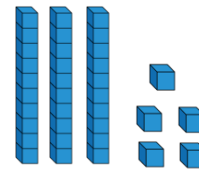
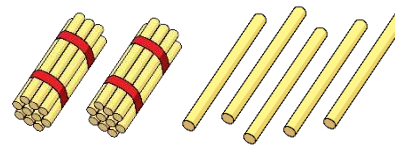
Complete the sentences.

There are _____ tens and _____ ones.

The number is _____.

Represent 45 on a bead string and complete the same sentence stems.

Match the number to the correct representation.



One ten and
five ones

Thirty-five

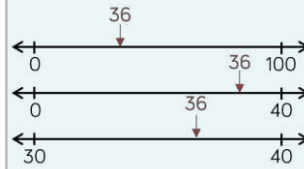
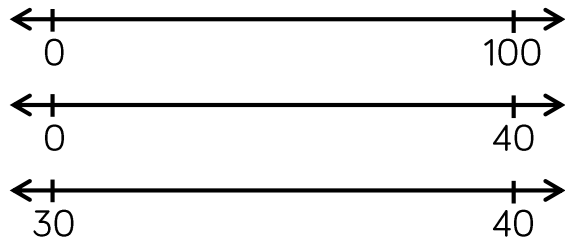
25

Represent 67 in **three different** ways.

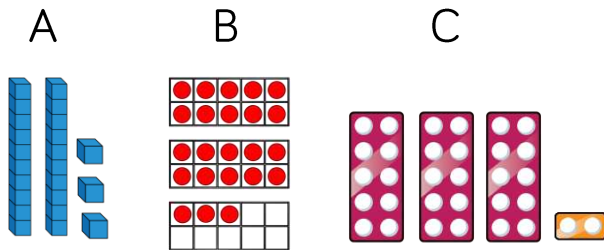
Represent Numbers to 100

Reasoning and Problem Solving

Where would 36 go on each of the number lines?

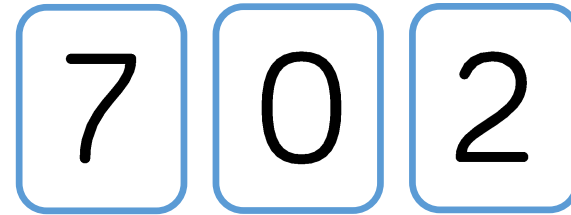


One of these images **does not** show 23. Can you explain the mistake?



C does not show 23, it shows 32. They have reversed the tens and ones.

How many two digit numbers can you make using the digit cards?



What is the largest number? Prove it by using concrete resources.

What is the smallest number? Prove it by using concrete resources.

Why can't the 0 be used as a tens number?

70, 20, 72, 27

The largest number is 72

The smallest number is 20

Because it would make a 1 digit number.

Tens and Ones (1)

Notes and Guidance

Children should have an understanding of what each digit represents when partitioning a number.

It is important that children can partition numbers in a variety of ways, not just as tens and ones. For example, 58 is made up of 5 tens and 8 ones or 4 tens and 18 ones, or 2 tens and 38 ones, etc.

Mathematical Talk

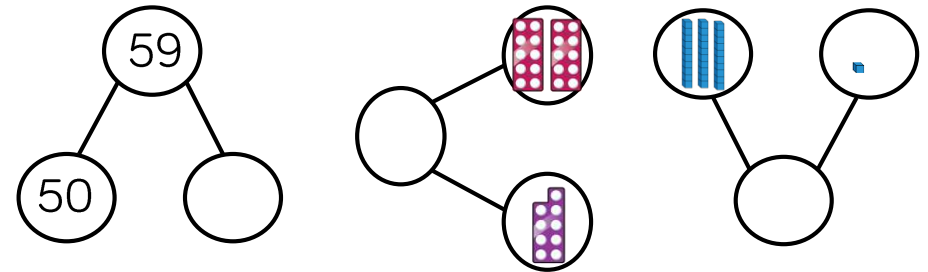
Which part do we know? How can we use the whole and part to work out the missing part?

Can you use concrete resources/draw something to help you partition?

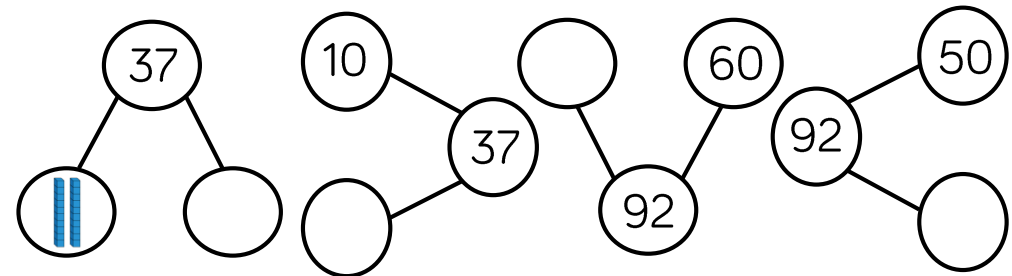
How can you rearrange the counters to help you count the lemon and strawberry cupcakes?

Varied Fluency

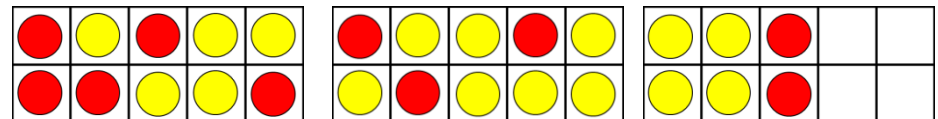
Complete the part-whole models.



Complete the part-whole models.



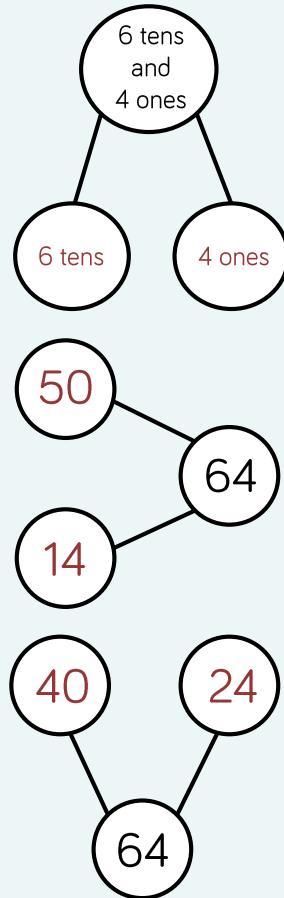
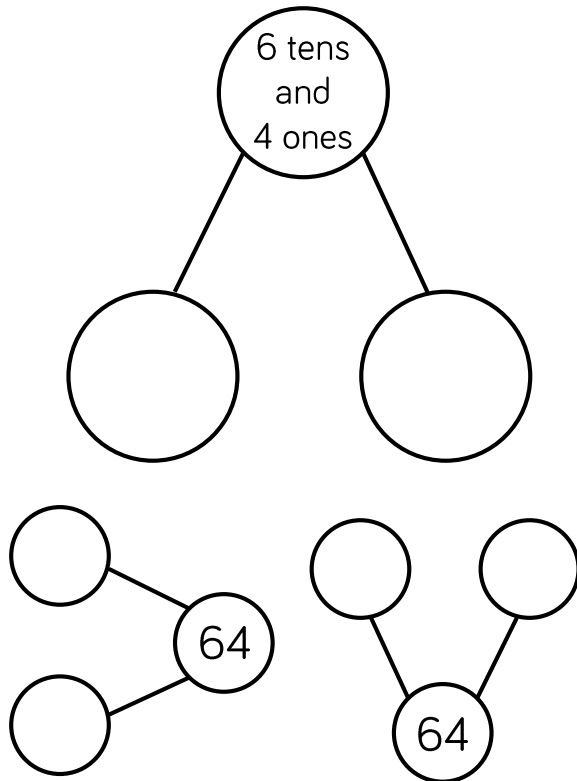
The ten frames represent lemon and strawberry cupcakes. Draw a part-whole model to show how many cupcakes there are altogether.



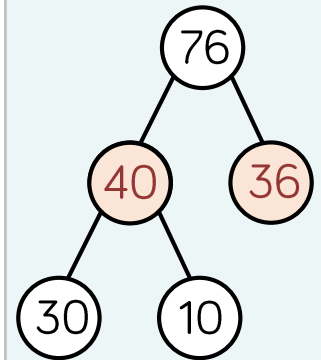
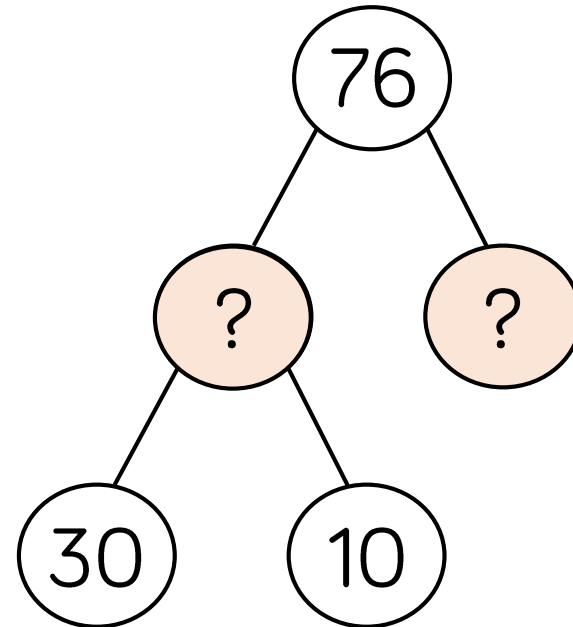
Tens and Ones (1)

Reasoning and Problem Solving

Complete each part-whole model in a different way.



Complete the extended part-whole model.



Tens and Ones (2)

Notes and Guidance

Children continue to use a part-whole model to explore how tens and ones can be partitioned and recombined to make a total.

Children will see numbers partitioned in different ways. For example, 39 written as $20 + 19$

This small step will focus on using the addition symbol to express numbers to 100. For example, 73 can be written as $70 + 3 = 73$

Mathematical Talk

What clues are there in the calculations? Can we look at the tens number or the ones number to help us?

What number completes the part-whole model?

What is the same/different about the calculations?

What are the key bits of information? Can you draw a diagram to help you?

Varied Fluency

- Match the number sentence to the correct number.

$20 + 19$

$10 + 4$

$40 + 0$

$80 + 1$

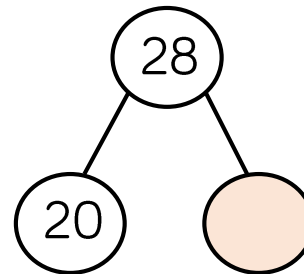
40

14

81

39

- Complete the part-whole model and write four number sentences to match.



$$\begin{array}{l} \underline{\quad} + \underline{\quad} = \underline{\quad} \\ \underline{\quad} + \underline{\quad} = \underline{\quad} \\ \underline{\quad} = \underline{\quad} + \underline{\quad} \\ \underline{\quad} = \underline{\quad} + \underline{\quad} \end{array}$$

- Dora has 20 sweets and Amir has 15 sweets. Represent the total number of sweets:

- With concrete resources.
- In a part-whole model.
- As a number sentence.

Tens and Ones (2)

Reasoning and Problem Solving

Teddy thinks that,



$$40 + 2 = 402$$

$40 + 2 = 42$
Teddy has just combined the numbers to make 402 without thinking about their place value.

Explain the mistake he has made.

Can you show the correct answer using concrete resources?

Fill in the missing numbers.

$$1 \text{ ten} + 3 \text{ ones} = 13$$

$$2 \text{ tens} + \underline{\quad} \text{ ones} = 23$$

$$3 \text{ tens} + 3 \text{ ones} = \underline{\quad}$$

$$\underline{\quad} \text{ tens} + 3 \text{ ones} = 43$$

What would the next number in the pattern be?

1 ten + 3 ones = 13
2 tens + 3 ones = 23
3 tens + 3 ones = 33
4 tens + 3 ones = 43

5 tens + 3 ones = 53

Place Value Charts

Notes and Guidance

Children should formally present their work in the correct place value columns to aid understanding of place value.

It is important for children to use concrete, pictorial and abstract representations in their place value chart.

Mathematical Talk

How many tens are there?

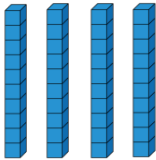
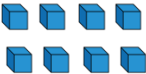
How many ones are there?

What is different about using Base 10 to using place value counters?

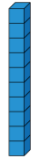

Can you write any other number sentences about the place value chart?

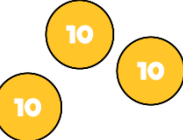

Varied Fluency

- What number is represented in the place value chart?

Tens	Ones
	

- Complete the place value chart using Base 10 and place value counters to represent the number 56

Tens	Ones
	

Tens	Ones
	

- What number is represented in the place value chart?

Tens	Ones
9	1

Write two different number sentences for this number.

$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} = \underline{\quad} + \underline{\quad}$$

Place Value Charts

Reasoning and Problem Solving

How many two digit numbers can you make that have the same number of tens and ones?

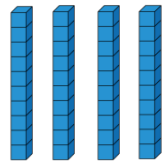

Show each one on a place value chart.

Tens	Ones

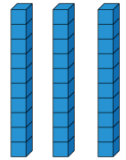
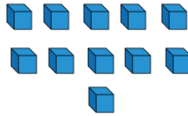
There are nine possibilities:
11, 22, 33, 44, 55,
66, 77, 88, 99

Do both place value charts show the same value?

A

Tens	Ones
	

B

Tens	Ones
	

Yes, they both have the same value of 41

$$40 + 1 = 41$$

$$30 + 11 = 41$$

Same: Both A and B show 41

Different: There are a different number of tens and ones in each place value chart.

What is the same?

What is different?

Compare Objects

Notes and Guidance

Comparing objects is introduced once children have a secure understanding of numbers in a place value chart.

Children are expected to compare a variety of objects using the vocabulary 'more than', 'less than' and 'equal to' and the symbols $<$, $>$, $=$

Mathematical Talk

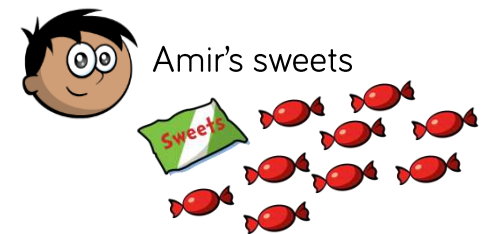
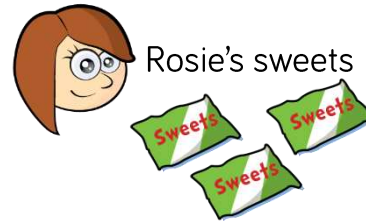
How can you arrange the objects to make them easy to compare?

Do groups of ten help you count? Why?

Do groups of ten help you compare? Why?

Varied Fluency

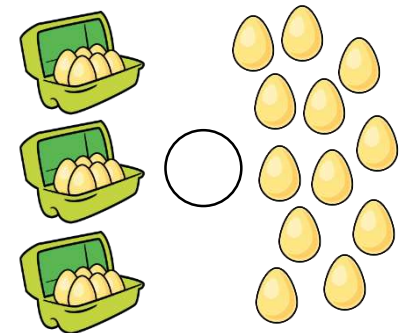
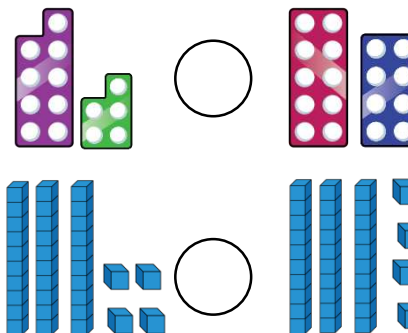
- A packet of sweets contain 10 sweets.



Who has the most sweets?

- Use cubes to show that:
 - Eleven is less than fifteen
 - 19 is greater than 9
 - 2 tens is equal to 20

- Use $<$, $>$ or $=$ to complete.

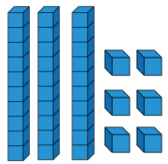


Compare Objects

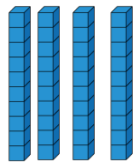
Reasoning and Problem Solving

Rosie and Amir are comparing numbers they have made.

Rosie's number



Amir's number



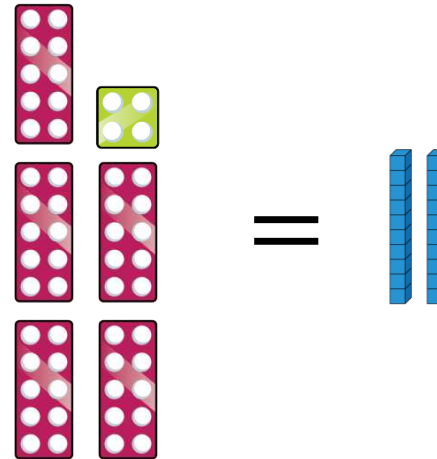
My number is greater because I have more objects.

Is Rosie correct?

Explain your answer.

Rosie is incorrect because Amir has 4 tens which makes 40 and Rosie has 3 tens and 6 ones which makes 36, therefore Amir has more.

Add more Base 10 to make the number shapes and the Base 10 equal.



How much did you add in total to make them equal?

What is the smallest amount you could add if the symbol changed to $<$?

Children should add 3 tens and 4 ones to make 54 on both sides.

If the symbol changed to $<$ the smallest amount they could add is 3 tens and 5 ones.

Compare Numbers

Notes and Guidance

Children compare numbers using the language greater than, less than, more than, fewer, most, least and equal to.

They are able to use the symbols $<$, $>$ and $=$ to write number sentences.

Children should have access to concrete resources to help them justify their answers.

Mathematical Talk

Can you prove your answers using concrete resources?

Can you prove your answers by drawing a diagram?

Is there more than one answer?

Do you need to work the number sentences out to decide which is greater?

Varied Fluency

Complete the statements using **more than**, **less than** or **equal to**.

42 is _____ 46

81 is _____ $60 + 4$

$30 + 8$ is _____ thirty-eight

Complete the number sentences.

4 tens and 9 ones $>$ _____

_____ $<$ $70 + 5$

_____ = eight tens

Put $<$, $>$ or $=$ in each circle to make the statements correct.

28 ○ 30

90 ○ $70 + 28$

$30 + 23$ ○ $40 + 13$

$20 + 14$ ○ 24

Compare Numbers

Reasoning and Problem Solving

How many different numbers can go in the box?

$$13 < \square < 20$$

There are six different numbers:
14, 15, 16, 17, 18, 19

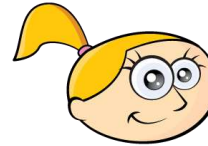
True or False?

One ten and twelve ones is bigger than 2 tens.

Explain how you know.

True
One ten and twelve ones = 22
Two tens = 20

Eva says,



When comparing numbers, the number with the highest number of ones is always the bigger number.

Do you agree?

Give some examples to support your answer.

Disagree, for example 19 is smaller than 21

Order Objects and Numbers

Notes and Guidance

Children order numbers and objects from smallest to greatest or greatest to smallest.

They should be encouraged to use concrete or pictorial representations to prove or check their answers.

Children use the vocabulary 'smallest' and 'greatest' and may also use the $<$ or $>$ symbols to show the order of their numbers.

Mathematical Talk

How does the number line help you order the numbers?

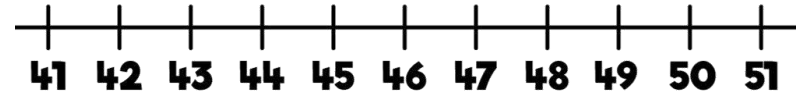
How does Base 10 prove that your order is correct?

How did you know which of the diagrams represented the smallest/greatest number?

Did you look at the tens or ones?

Varied Fluency

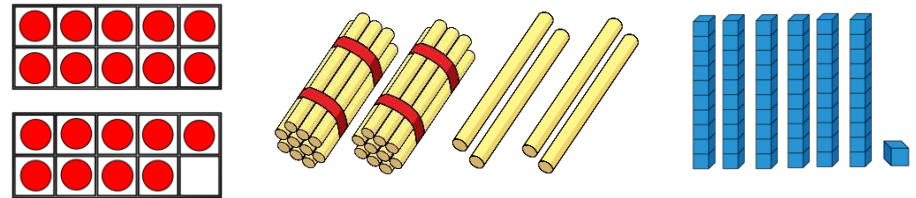
- Circle the numbers 48, 43 and 50 on the number line.



Put the numbers 48, 43 and 50 in order starting with the smallest.

- Use Base 10 to make the numbers sixty, sixteen and twenty-six. Write the numbers in order starting with the greatest number.

- The diagrams represent different numbers.



Circle the greatest number.

Circle the smallest number.

Complete the number sentence $\underline{\quad} > \underline{\quad}$

Order Objects and Numbers

Reasoning and Problem Solving

Order the numbers below.
Which would be the fourth number?

33 53 37

29 34 43

Explain how you ordered them.

If I ordered them from smallest to largest:
29, 33, 34, 37, 43, 53 then 37 would be the fourth number.

Alternatively, if I order the numbers from largest to smallest:
53, 43, 37, 34, 33, 29 then 34 would be the fourth number.

Mo has written a list of 2-digit numbers.



The digits of each number add up to five.
None of the digits are zero.

Can you find all the numbers Mo could have written?

Write the numbers in order from smallest to largest.

What strategy did you use?

14, 23, 32, 41

Count in 2s, 5s and 10s

Notes and Guidance

Children count forwards and backwards in 2s, 5s and 10s. It is important that children do not always start from zero, however they should start on a multiple of 2 or 5 when counting in 2s and 5s but can start from any number when counting in 10s. For example when counting in 2s they should not start at 3.

Encourage children to look for patterns as they count.

Mathematical Talk

What do you notice? Are the numbers getting larger or smaller?

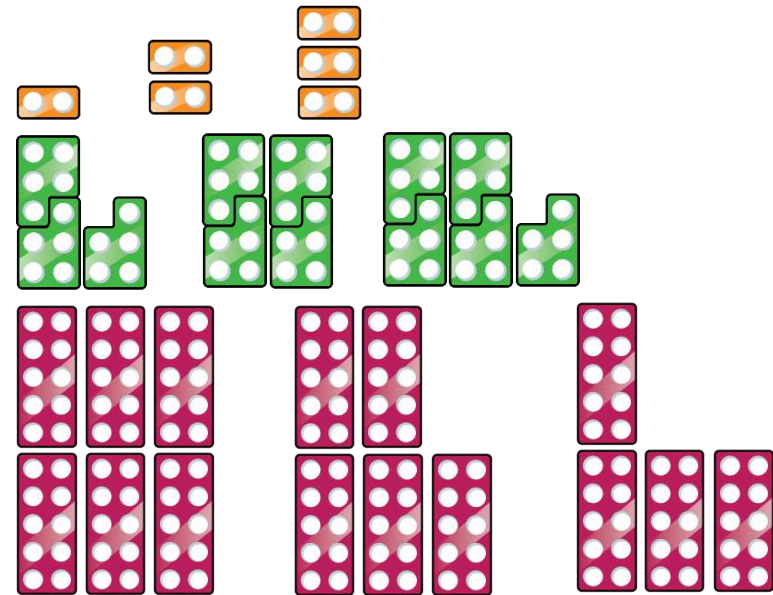
Are the numbers getting bigger or smaller each time? By how many?

Can you spot a pattern?

Why is it the odd one out? Can you correct the mistake?

Varied Fluency

Continue each number sequence.



Circle the odd one out in each number sequence.

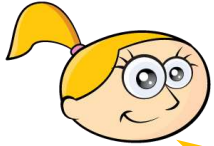
- 2, 4, 6, 8, 9, 10, 12.....
- 0, 5, 10, 20, 30, 40.....
- 35, 30, 25, 20, 12, 10.....

Count forwards and backwards in jumps of 10 from fifty-seven.

Count in 2s, 5s and 10s

Reasoning and Problem Solving

Eva says,



If you count in 5s from any number in the five times table, your numbers will end in 5 or 0

Agree.
Each number in the 5 times table does end in a 5 or 0
5, 10, 15, 20, 25, 30, 35, 40, 45, 50 etc.

Do you agree with Eva?

Prove it.

Always, Sometimes, Never

- When counting in 2s from zero the numbers are even.
- When counting in 5s from zero the numbers are even.
- When counting in 10s from zero the numbers are even.

- Always
- Sometimes
- Always

Teddy and Whitney are both counting from zero to twenty.

- Teddy is counting in 2s.
- Whitney is counting in 5s.

Yes they will both say 10 and 20

The numbers that are the same are the tens.

Will they say any of the same numbers?
What do you notice about your answer?

Count in 3s

Notes and Guidance

Children count forwards and backwards in 3s from any multiple of 3

Encourage children to look for patterns as they count and use resources such as a number track, a counting stick and concrete representations.

Mathematical Talk

What do you notice about the numbers?

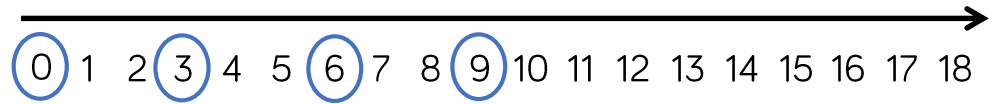
Are the numbers in the sequence getting larger or smaller?

Can you spot a pattern?

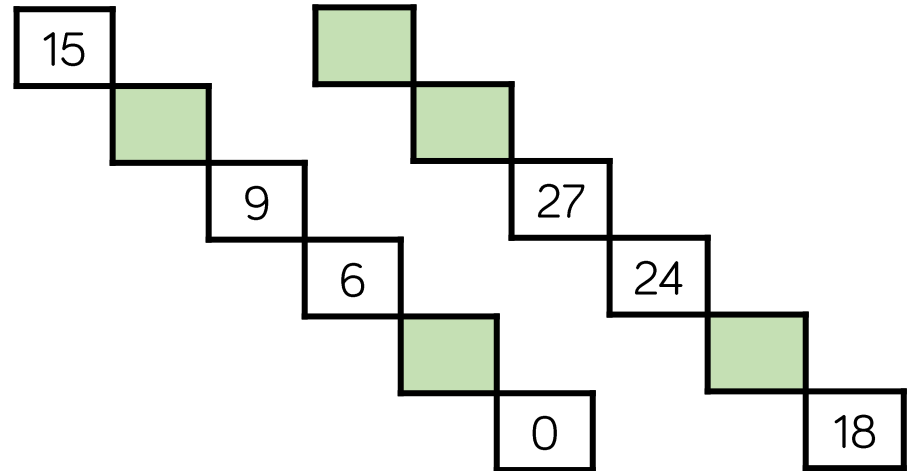
What are you counting up in?

Varied Fluency

- What do you notice about the numbers that are circled? Continue the pattern.



- Complete the number sequences.



- Amir has 15 stickers. He collects 3 more each day. Complete the number track to show how many he will have in six days.



Count in 3s

Reasoning and Problem Solving

True or False?



I start at 0 and count in 3s
I say the number 14

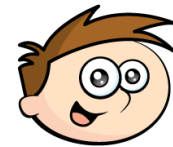
Explain your answer.

False.
If I count in 3s I
say 3, 6, 9, 12, 15...

Teddy is counting in 2s and Jack is counting in 3s.

Teddy	2	4	6	8
Jack	3	6	9	12
+				

Teddy says,



If we add our numbers together as we count we can make a new number pattern.

What pattern do they make?
What happens if both Teddy and Jack count in 5s and they add them together to make a new pattern?

If Teddy and Jack add their numbers together they will be counting in 5s.

If Teddy and Jack both count in 5s their new pattern would be counting in 10s.