

White Rose Maths Hub
Small steps guidance and examples

Year 2

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, forward and backward.

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 both numerals and words.

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

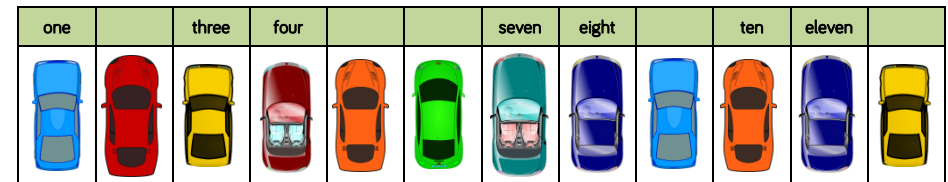
How can you count the cars? Do you have a strategy?
What is one more/one less?

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?

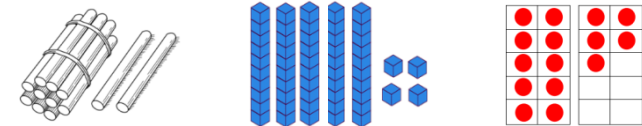
Varied Fluency

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



There are cars in the car park.

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



- 3 Match the numerals to the words.

17

48

38

70

Thirty eight

Seventy

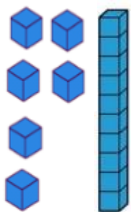
Forty eight

Seventeen

Count Objects to 100

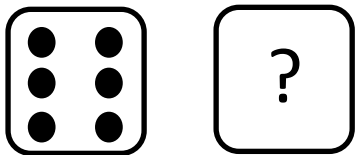
Reasoning and Problem Solving

Tom says he has 61
Is he correct?
Explain your reasoning



Tom is not correct
because he has 16. He
has switched his ten
and one around.

Freddy rolls two dice.
One dice shows a 6.
What could his total be?
Write your answers in words.



How many dots of one die?
How did you count the dots?
How many dots on a nine sided die?

Freddy's totals could
be: seven, eight, nine,
ten, eleven and twelve.

6 sided die:
21 dots

9 sided die:
50 dots

Each bag contains 10 cookies.



How many cookies are there
altogether?

Write your answers 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
equals 40, then count
on 8 more.)*

Representing Numbers

Notes and Guidance

Children need to be able to represent numbers to 100 using a range of concrete materials.

In this small step, 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?

Which part of the resource represents tens/ones?

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

Varied Fluency

- 1 Here is part of a bead string.



Complete the sentence.

There are tens and ones.

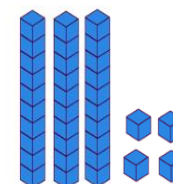
The number is

Represent 45 on a bead string.

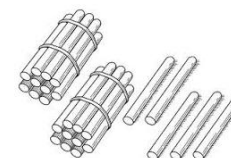
- 2 Match the number to the correct representation.



Three tens
and four ones



Twenty five



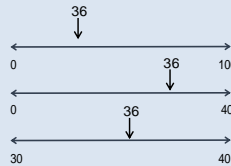
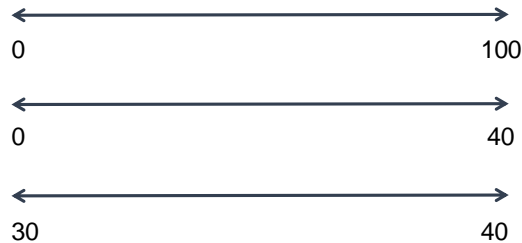
33

- 3 Represent 67 in **three different** ways?

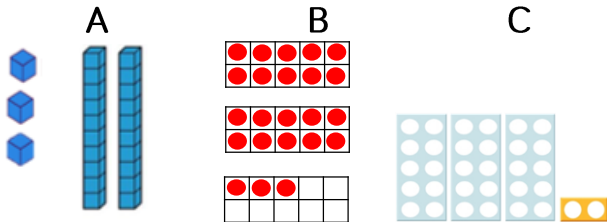
Represent Numbers

Reasoning and Problem Solving

Place 36 on each of the number lines below:

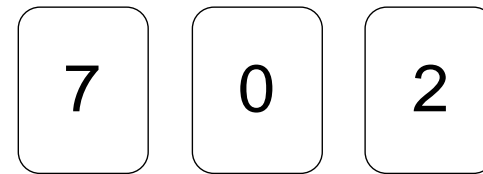


One of these images does not show 23. Can you explain the mistake?



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.

Tens and Ones (1)

Notes and Guidance

Children now partition numbers and need to have an understanding of what each digit represents.

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 20 and 38, etc.

Mathematical Talk

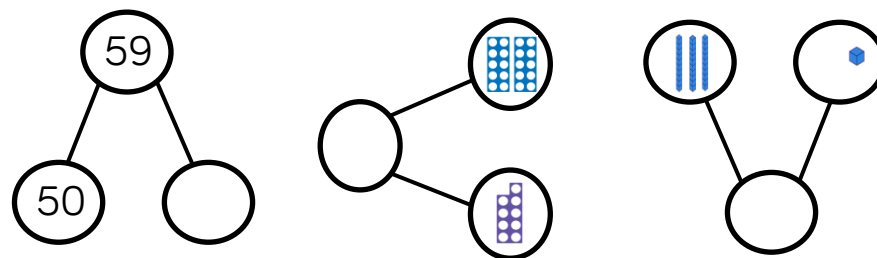
Which part do we know? How can we use the whole and part to work out the missing part?

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

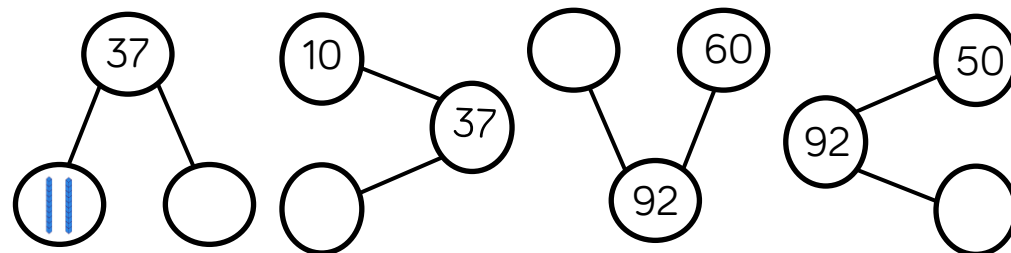
How can you rearrange the counters to help you count the lemon and strawberry cupcakes?

Varied Fluency

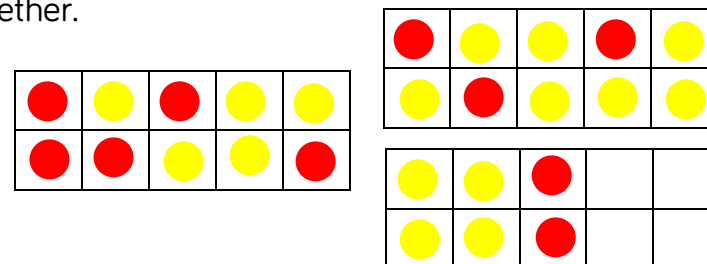
- 1 Complete the part whole models.



- 2 Complete the part whole models.



- 3 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)

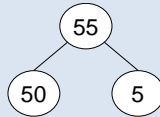
Reasoning and Problem Solving

Charlotte says:



In a part whole model you cannot use the same digit twice

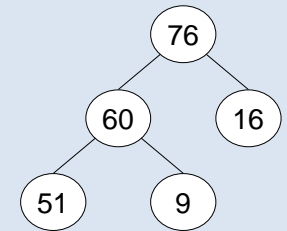
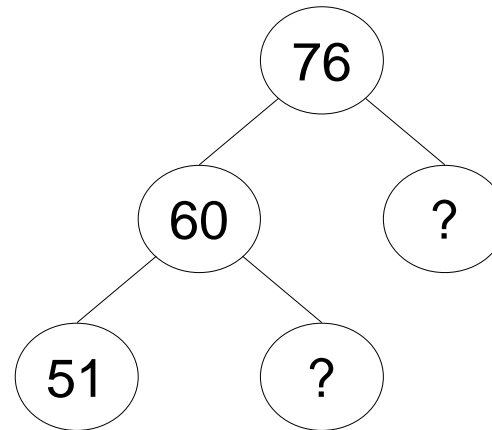
Disagree- you can use the same digit in a part whole model. i.e



Do you agree with Charlotte?

Explain your reasoning.

Complete the extended part whole model:



Tens and Ones (2)

Notes and Guidance

Children will build on previous learning on the part whole model and how tens and ones can be partitioned and recombined to make a total.

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 and different about the calculations?

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

Varied Fluency

- 1 Match the number sentences to the correct number.

$20 + 19$

$10 + 4$

$40 + 0$

$80 + 1$

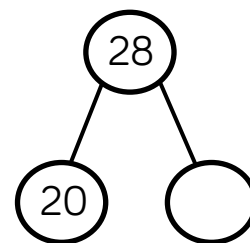
40

14

81

39

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



_____	+	_____	=	_____
_____	+	_____	=	_____
_____	=	_____	+	_____
_____	=	_____	+	_____

- 3 Hattie has 20 sweets and Noah 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

Joel thinks that:



$$40 + 2 = 402$$

Explain the mistake he has made.

Can you show the correct answer using concrete resources?

$40 + 2 = 42$
Joel has combined the
numbers to make 402

Fill in the missing numbers:

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

$$2 \text{ tens} + \boxed{} \text{ ones} = 23$$

$$\boxed{}3 \text{ tens} + 3 \text{ ones} = \boxed{}$$

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

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

To build on skills previously taught, children are now formally presenting 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?

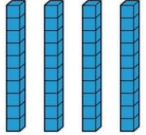

How many ones are there?

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



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

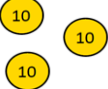

Varied Fluency

- 1 What number is represented in the place value chart?

Tens	Ones
	

- 2 Complete the place value charts using Base 10 and place value counters to represent the number 56.

Tens	Ones
	

Tens	Ones
	

- 3 What number is represented in the place value chart?

Tens	Ones
9	1

Write two different number sentences for this number.

$$\begin{array}{rclcl} \underline{\quad} & + & \underline{\quad} & = & \underline{\quad} \\ \underline{\quad} & = & \underline{\quad} & + & \underline{\quad} \end{array}$$

Place Value Charts

Reasoning and Problem Solving

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

Tens	Ones

Tens	Ones

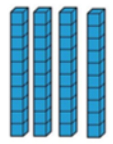

Tens	Ones

Possible answers:

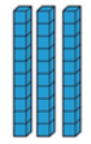

11
22
33
44
55
66
77
88
99

Are these two place value charts of equal value?

A

Tens	Ones
	

B

Tens	Ones
	

What is the same?

What is different?

Yes they are of the same value - 41.

$$40 + 1 = 41$$

$$30 + 11 = 41$$

Same: Both A and B show 41

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

Comparing Objects

Notes and Guidance

Once children are secure with tens and ones and how to place numbers on a place value chart, comparing objects can be introduced.

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

Mathematical Talk

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

Do groups of ten help you count? Why?

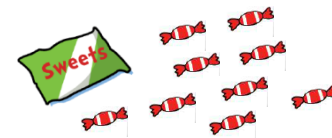
Varied Fluency

- 1 A packet of sweets contain 10 sweets.

Helena's sweets



Zak's sweets

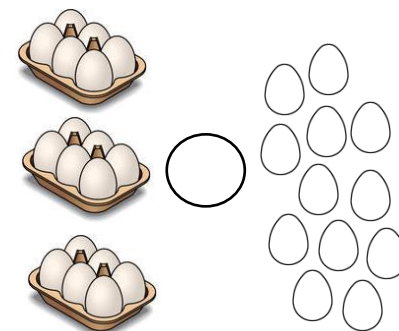
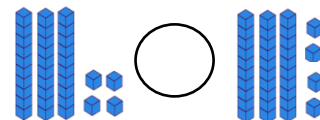
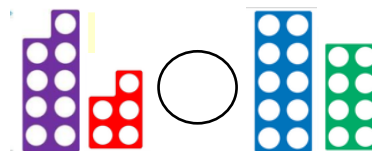


Who has the most sweets?

- 2 Use cubes to show that:

- Eleven is less than fifteen.
- 19 is greater than 9.
- 2 tens is equal to 20.

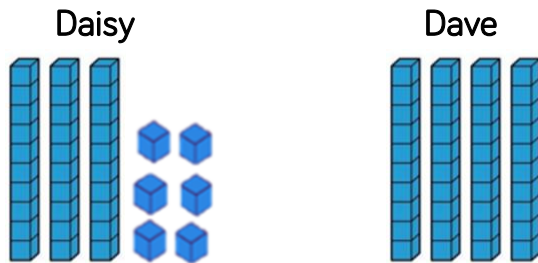
- 3 Put $<$, $>$ or $=$ in each circle.



Compare Objects

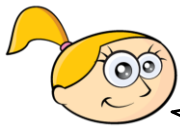
Reasoning and Problem Solving

Daisy and Dave are comparing numbers that they have made.



Daisy is incorrect because Dave has 4 tens which makes 40 and Daisy has 3 tens and 6 ones which makes 36. Therefore Dave has more.

Daisy

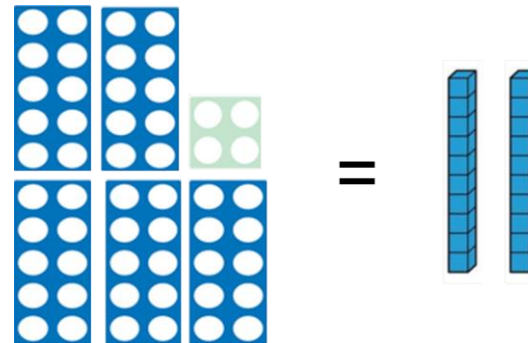


My number is greater because I have more objects.

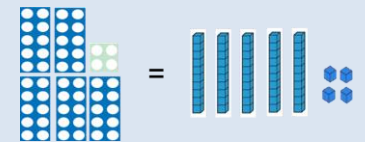
Is Daisy correct?

Explain your answer.

Use Base 10 to make A and B equal:



How could you make B more than A?



B can be greater than A if you add more than 34 to it.

Comparing 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.

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

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

42 is _____ 46

81 is _____ $60 + 4$

$30 + 8$ is _____ thirty eight

- 2 Complete the number sentences.

4 tens and 9 ones $>$ _____

_____ $<$ $70 + 5$

eight tens = _____

- 3 Put $<$, $>$ or $=$ in each circle.

28 30

90 $70 + 28$

$30 + 23$ $40 + 13$

$20 + 14$ 24

Comparing Numbers

Reasoning and Problem Solving

How many different numbers can go in the box?

$$13 < \square < 20$$

14,15,16,17,18,19

True or False:

One ten and twelve ones is bigger than two tens.

Explain how you know.

True:
One ten + twelve ones
= 22
Two tens = 20

Fill in the missing numbers using 1,2,4 and 7

	<	<	8
^		v	v
5	<	6	>
v		^	v
	<	9	>

4	<	7	<	8
^		v		v
5	<	6	>	3
v		^		v
2	<	9	>	1

Ordering 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?

Varied Fluency

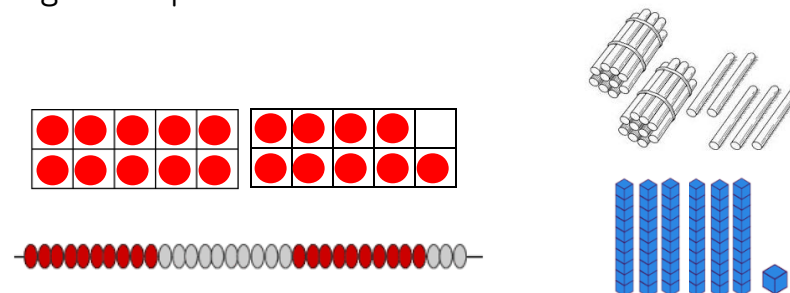
- 1 Circle the numbers 48, 43 and 50 on the number line.



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

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

- 3 The diagrams represent different numbers.



Circle the greatest number.

Circle the smallest number.

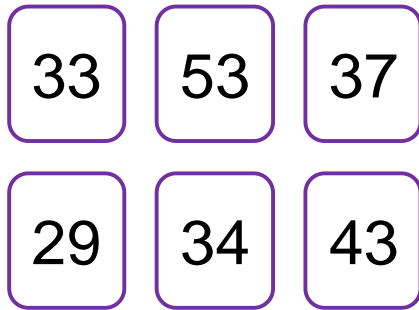
Complete the number sentence _____ $>$ _____

Order Numbers and Objects

Reasoning and Problem Solving

If you ordered the numbers below, which would be the fourth?

Explain how you ordered them.



37 would be the fourth number

I ordered them from smallest to largest:

29, 33, 34, 37, 43, 53

Bill has written a list of 2 digit numbers.

The digits of each number add up to 5.

None of the digits are 0.

Can you find all the numbers Bill could have written?

Write the numbers in order from smallest to largest.

14, 23, 32, 41

Counting in 2s, 5s, 10s

Notes and Guidance

Children now need to count on and back 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?

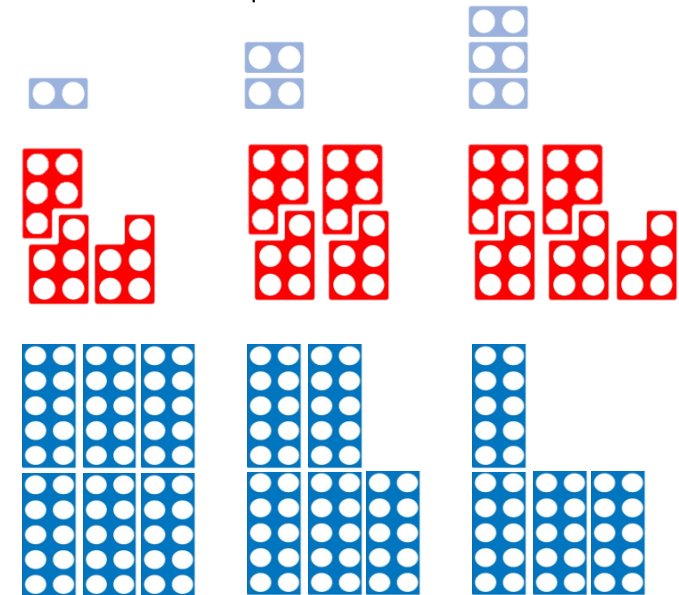
Are the numbers getting bigger or smaller each time? By how much?

Can you spot a pattern?

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

Varied Fluency

1 Continue each number sequence.



2 Circle the odd one out in each number pattern.

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

3 Count forwards and backwards in jumps of ten from:

- Fifty seven
- $40 + 1$

Counting in 2s, 5s, 10s

Reasoning and Problem Solving

Alfie says:

If you count in 5s from any number in the five times table your numbers have to end in 5 or 0.



Do you agree with Alfie?

Prove it.

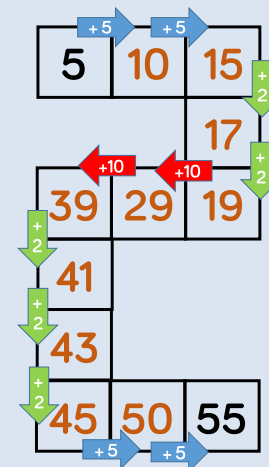
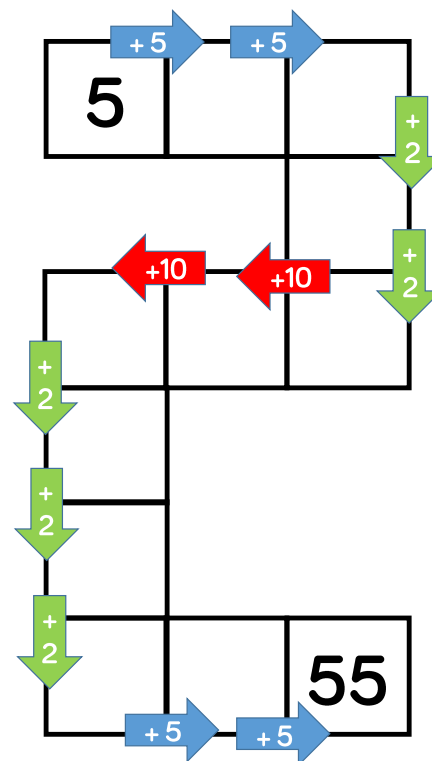
Agree.

Each number in the 5 times tables does end in a 5 or 0.

5, 10, 15, 20, 25, 30, 35, 40, 45, 50.

Using these numbers, travel from 5 to 53 adding 2s, 5s and 10s:

10, 29, 43, 15, 17, 48, 39, 19, 41



Counting in 3s

Notes and Guidance

Children now need to count on and back 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.

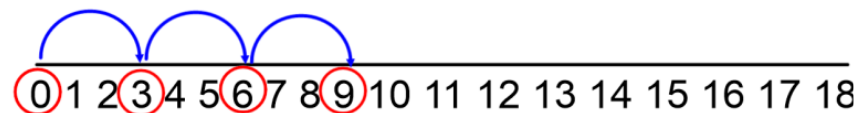
Mathematical Talk

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

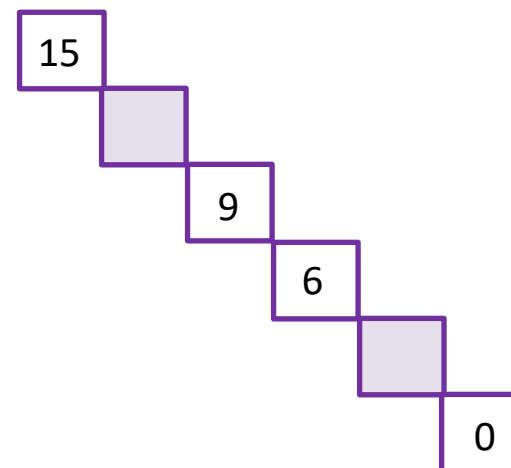
Can you spot a pattern?

Varied Fluency

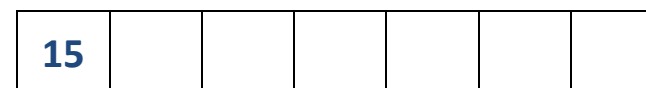
- 1 What do you notice about the numbers that are circled? Continue the pattern.



- 2 Complete the number sequence.



- 3 Sid has 15 stickers. He collects 3 more each day. Complete the number track to show how many he will have in 6 days.



Counting in 3s

Reasoning and Problem Solving

True or False

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

False, If I count in 3s I go: 3, 6, 9, 12, 15

Sid is counting in 2s, Luke is counting in 3s.

Sid	2	4	6	8
Luke	3	6	9	12
+				

Sid says:



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

What pattern do they make?

What happens if both Sid and Luke count in 5s?

If Sid and Luke add their numbers together they will be counting in 5s.

If Sid and Luke both count in 5s they will be counting in 10s.