

Spring Scheme of Learning

Year 1

#MathsEveryoneCan



# Contents

|  |    |
|--|----|
| ▶ Meet the Characters .....                        | 3  |
| ▶ Yearly Overview .....                            | 4  |
| ▶ Spring Blocks                                    |    |
| ▶ Block 1 - Number: Addition and Subtraction ..... | 5  |
| ▶ Block 2 - Number: Place Value (within 50) .....  | 23 |
| ▶ Block 3 - Measurement: Length and Height .....   | 43 |
| ▶ Block 4 - Measurement: Weight and Volume .....   | 51 |

## Meet the Characters

Children love to learn with characters and our team within the scheme will be sure to get them talking and reasoning about mathematical concepts and ideas. Who's your favourite?



Teddy



Rosie



Mo



Eva



Alex



Jack



Whitney



Amir



Dora



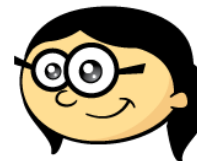
Tommy



Dexter



Ron



Annie

|        | Week 1  | Week 2 | Week 3 | Week 4            | Week 5  | Week 6                           | Week 7                           | Week 8                         | Week 9             | Week 10                         | Week 11 | Week 12       |
|--------|---|--------|--------|-------------------|---|----------------------------------|----------------------------------|--------------------------------|--------------------|---------------------------------|---------|---------------|
| Autumn | Number: Place Value (within 10)   |        |        |                   | Number: Addition and Subtraction (within 10)                        |                                  |                                  |                                | Geometry: Shape    | Number: Place Value (within 20) |         | Consolidation |
| Spring | Number: Addition and Subtraction (within 20)  |        |        |                   | Number: Place Value (within 50) (Multiples of 2, 5 and 10 included) |                                  |                                  | Measurement: Length and Height |                    | Measurement: Weight and Volume  |         | Consolidation |
| Summer | Number: Multiplication and Division (Reinforce multiples of 2, 5 and 10 to be included) |        |        | Number: Fractions |   | Geometry: Position and Direction | Number: Place Value (within 100) |                                | Measurement: Money | Measurement: Time               |         | Consolidation |

**White**

**Rose  
Maths**

Spring - Block 1

**Addition & Subtraction**

# Overview

## Small Steps

- ▶ Add by counting on
- ▶ Find & make number bonds
- ▶ Add by making 10
- ▶ Subtraction – Not crossing 10
- ▶ Subtraction – Crossing 10 (1)
- ▶ Subtraction – Crossing 10 (2)
- ▶ Related facts
- ▶ Compare number sentences

## NC Objectives

Represent and use number bonds and related subtraction facts within 20

Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs.

Add and subtract one-digit and two-digit numbers to 20, including zero.

Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as  $7 = \square - 9$

## Add by Counting On

### Notes and Guidance

Children explore addition by counting on from a given number. They begin to understand that addition is commutative and that it is more efficient to start from the largest number. It is important that children see that they are not just adding two separate numbers or items, they are adding to what they already have.

Ensure children do not include their start number when counting on.

### Mathematical Talk

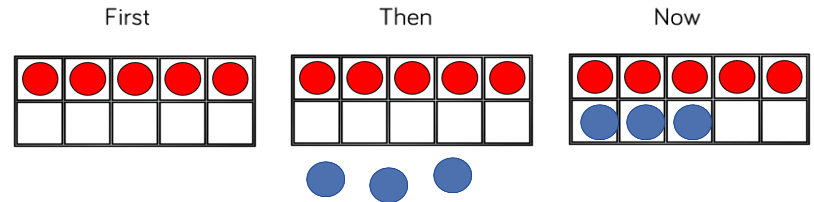
What number did you start with? Then what happened? Now what do I have?

What does each number represent? What do the counters represent?

How can I represent counting on using practical equipment?  
How can I represent counting on using a bar model or a number line?

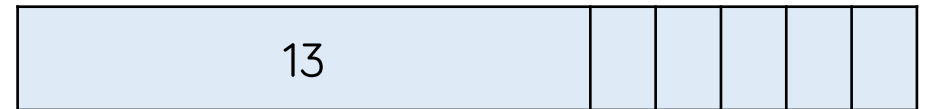
### Varied Fluency

- Use ten frames to complete the number story.

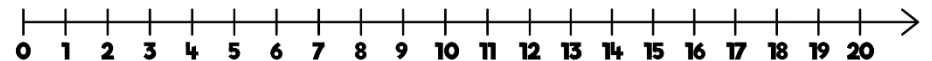


First there were \_\_\_ cars in the car park.  
Then \_\_\_ more cars parked in the car park.  
Now there are \_\_\_ cars in the car park.

- Eva has 13 prize tokens.  
She wins 5 more.  
How many prize tokens does Eva have now?



- Mo starts at 9 and counts on 6       $9 + 6 = \square$   
Show his calculation on the number line.



# Add by Counting On

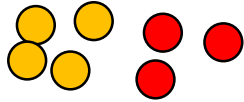
## Reasoning and Problem Solving

Use the diagram and counters to tell your own number story for these calculations:

$0 + 12 = \underline{\quad}$

$7 + 0 = \underline{\quad}$

$14 + \underline{\quad} = 17$



| First | Then | Now |
|-------|------|-----|
|       |      |     |

Children can come up with a range of contexts where they have an amount that is increasing. Using 'First, then and now' they describe it.

Mo and Jack are working out  $11 + 7$

Mo says,



11, 12, 13, 14, 15, 16, 17

Jack says,



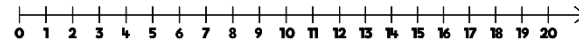
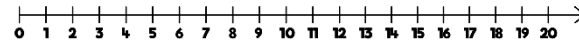
12, 13, 14, 15, 16, 17, 18

Use a number line to show who is correct.

Jack is correct as he has counted on 7 steps from 11. Mo has incorrectly included 11 when counting.

Ron starts at 9 and adds on 5  
 Alex starts at 5 and adds on 9  
 Show their calculations on the number lines.  
 What do you notice? Does this always happen?

Which method do you like best? Why?



Both children end on 14  
 This is because  $9 + 5$  is equivalent to  $5 + 9$

The children can explore their own calculations to understand that addition is always commutative. They see that Ron's method is quicker because there is less to count on.

# Find & Make Number Bonds

## Notes and Guidance

Children see that working systematically helps them to find all the possible number bonds to 20

They will use their knowledge of number bonds to 10 to find number bonds to 20

Using examples such as,  $7 + 3$ ,  $17 + 3$  or  $7 + 13$  encourages children to see the link between bonds to 10 and bonds to 20 and reinforces their understanding of place value.

## Mathematical Talk

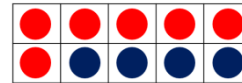
What strategy could you use to make sure you find all the number bonds?

What number bond can we see? How does this help us find the number bond to 20?

How does knowing your number bonds to 10 help you to work out your number bonds to 20?

## Varied Fluency

What number bond is represented in the pictures?

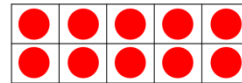


There are \_\_\_ red counters.

There are \_\_\_ blue counters.

Altogether there are \_\_\_ counters.

$\_\_ + \_\_ = \_\_$      $\_\_ + \_\_ = \_\_$



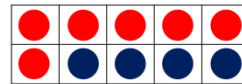
There are \_\_\_ red counters.

There are \_\_\_ blue counters.

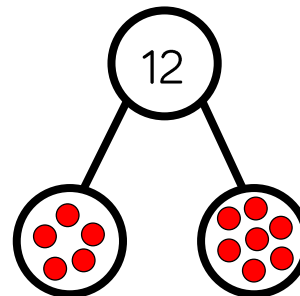
Altogether there are \_\_\_ counters.

$\_\_ + \_\_ = \_\_$

$\_\_ + \_\_ = \_\_$



Continue the pattern to find all the number bonds to 12  
How do you know you have found them all?



$12 = 12 + 0$

$12 = 11 + \_\_$

$12 = 10 + \_\_$

# Find & Make Number Bonds

## Reasoning and Problem Solving

Use equipment to represent each of the calculations below.

What is the same?  
What is different?

$$7 + 3 = 10$$

$$17 + 3 = 20$$

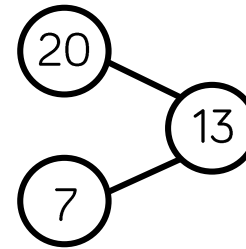
$$20 = 7 + 13$$

Explain your thinking.

Children may notice that the = is in a different place. They might notice that the number of ones remains the same and that a ten has been added to create a number bond to 20. Mathematical equipment such as ten frames or Base 10 will make this clear.



Jack represents a number bond to 20 in the part whole model.



Can you spot his mistake?

### True or false?

There are double the amount of numbers bonds to 20 than there are number bonds to 10

Prove it – can you use a systematic approach?

Possible response: Jack has put 20 as a part but it should be a whole.

False – there are 11 number bonds to 10 and 21 number bonds to 20. Children can show this in various ways.

# Add by Making 10

## Notes and Guidance

Children add numbers within 20 using their knowledge of number bonds.

It is important that children work practically using ten frames and/or number lines to help them see how number bonds to 10 can help them calculate.

They will move towards using this as a mental strategy.

## Mathematical Talk

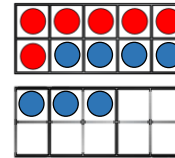
How can you partition a number and use your number bonds to 10 to help you?

How does using the counters help you to see this strategy?

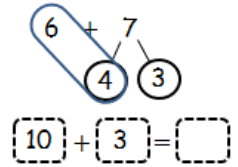
How does using a number line help you to see this strategy?

## Varied Fluency

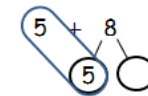
🔲 Rosie has used the 10 frames to calculate  $6 + 7$



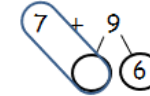
I partitioned the 7 into 4 and 3 so that I could make a full 10



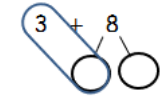
Use Rosie's method to complete:



$\square + 3 = \square$



$\square + \square = \square$

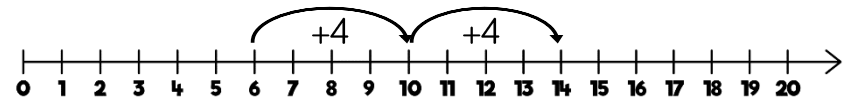


$\square + \square = \square$

🔲 Mo has used a number line to calculate  $6 + 8$



I partitioned 8 into 4 and 4 to make it easier.



Use Mo's method to calculate:

$5 + 8 = \square$

$9 + 4 = \square$

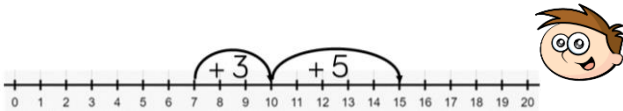
$6 + 8 = \square$

# Add by Making 10

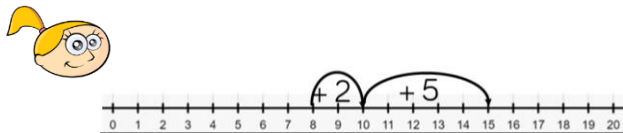
## Reasoning and Problem Solving

Teddy and Eva are adding together 7 and 8 using a number line.

Teddy shows it this way:



Eva shows it this way:



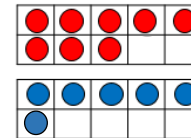
Who is correct?  
Explain your answer.

They are both correct because addition is commutative and the answer to both calculations is 15

Teddy has started with 7 and partitioned the 8 into 3 and 5 to make 10

Eva has started with 8 and partitioned the 7 into 2 and 5 to make 10

Dexter uses ten frames to calculate eight plus six.



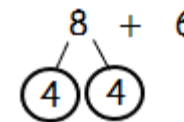
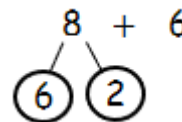
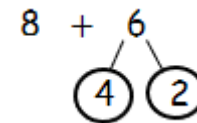
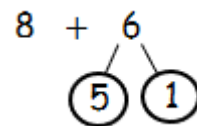
He says,



$$8 + 6 = 16$$

Do you agree?  
Explain why.

Annie is calculating  $8 + 6$   
Which of these methods is most helpful?  
Why?



Dexter is wrong because the answer should be 14. He should have filled the first ten frame before starting a second one.

Partitioning the 6 into 4 and 2 is helpful as 8 and 2 make 10

Partitioning the 8 into 4 and 4 is helpful as 6 and 4 make 10

# Subtraction – Not Crossing 10

## Notes and Guidance

Children build on the language of subtraction, recognising and using the subtraction symbol within 20

The use of zero is important so children know that when nothing is taken away, the start number remains the same or when the whole group is taken away, there will be nothing left.

They will also use the part-whole model alongside practical equipment to reinforce number bonds within 20

## Mathematical Talk

How many objects were there at first? Then what happened to the objects? How many objects are there now?

If Mo ate nothing, what number would we use to represent this? How do we write this as a calculation? What does the zero represent in this calculation?

If Mo ate all of the biscuits, what number would we be left with? How do we write this as a calculation? What does the zero represent in this calculation?

## Varied Fluency

There are 16 biscuits on a plate. Mo eats 5 of them.

Complete the sentences.

First there were \_\_\_ biscuits.

Then \_\_\_ were eaten.

Now there are \_\_\_ biscuits.

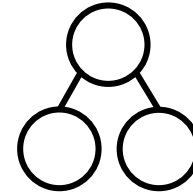
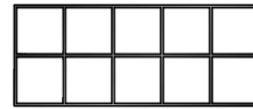
$16 - 5 = \underline{\quad}$

| First | Then | Now |
|-------|------|-----|
|       |      |     |

First there were 9 sheep. Then they all ran away.

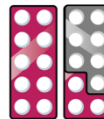
How many sheep are left?

Use ten frames and counters to represent the sheep.

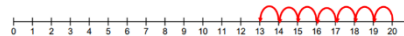


$\square - \square = \square$

Use the number pieces and the number line to complete the number sentences.



$20 - 7 = \underline{\quad}$



Use this method to calculate:

$20 - 8$

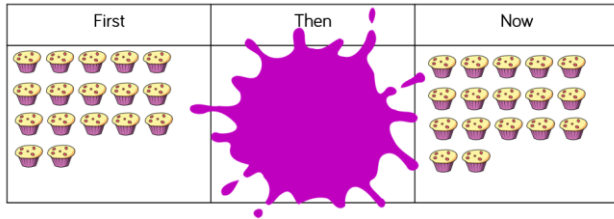
$18 - 6$

$19 - 4$

# Subtraction – Not Crossing 10

## Reasoning and Problem Solving

Annie, Tommy and Alex are working out which calculation is represented below.



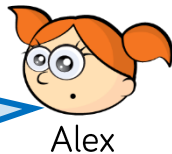
$17 - 17 = 0$



$17 - 0 = 17$



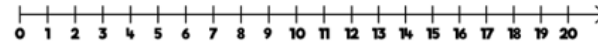
$0 - 17 = 17$



Can you work out who is correct?  
Explain why.

Possible response: Tommy is correct because first there were 17 cakes and now there are still 17 cakes so zero cakes were eaten.

How many ways can you complete this number sentence?  
Use the number line to help you.



$\square - \square = 11$

- $20 - 9 = 11$
- $19 - 8 = 11$
- $18 - 7 = 11$
- $17 - 6 = 11$
- $16 - 5 = 11$  etc.

# Subtraction – Crossing 10 (1)

## Notes and Guidance

For the first time, children will be introduced to subtraction where they have to cross ten. This small step focuses on the strategy of partitioning to make ten.

Children should represent this using concrete manipulatives or pictorially to begin with. Ten frames and number lines are particularly useful to model the structure of this strategy.

Children will move towards using this as a mental strategy.

## Mathematical Talk

How can you partition a number to help you subtract?

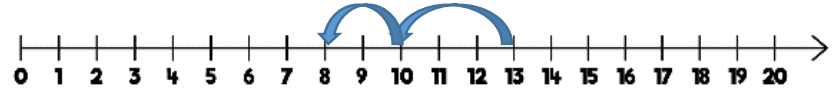
How does using the counters help you to see this strategy?

How does using a number line help you to see this strategy?

Can you think of another way to represent this problem?

## Varied Fluency

First there were 13 jam tarts      Then 5 were eaten      Now there are 8 jam tarts.



Rosie has used the ten frames to calculate  $12 - 5$


$12 - 5 = 7$

Use her method to complete:

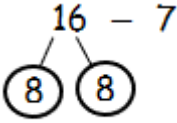
$10 - \square = \square$        $\square - \square = \square$        $\square - \square = \square$

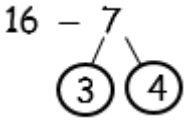
# Subtraction – Crossing 10 (1)

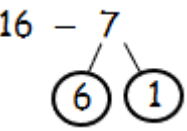
## Reasoning and Problem Solving

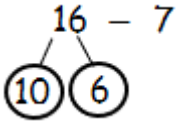
Rosie is calculating  $16 - 7$  

Which of these methods is most helpful? Why?

$16 - 7$   


$16 - 7$   



$16 - 7$   


$16 - 7$   


Could you find a way to partition 16 to help you subtract 7?

Partitioning the 7 into 6 and 1 is useful as Rosie can subtract the 6 to make 10 then subtract the 1


If you partition 16 into 7 and 9, you can subtract 7

Teddy works out  $15 - 6$   
This is Teddy's working out: 

$15 - 5 = 10 - 1 = 9$

Why is Teddy's working out wrong?

Use  $<$ ,  $>$  or  $=$  to make the statements correct.

 I can do this without working out any answers.

$17 - 5$

$12 - 5$

$14 - 4$

$18 - 8$

$11 - 7$

$11 - 4$

Is Whitney correct? Explain how you know.

Teddy has used the = sign incorrectly.  $10 - 1$  is not equal to  $15 - 5$ . He should have written:  
 $15 - 5 = 10$   
 $10 - 1 = 9$

$17 - 5 > 12 - 5$

$14 - 4 = 18 - 8$

$11 - 7 < 11 - 4$

# Subtraction – Crossing 10 (2)

## Notes and Guidance

Children subtract numbers, within 20, crossing the 10. Children begin to understand the different structures of subtraction (taking away, partitioning, difference).

They use concrete manipulatives and pictorial methods to support their understanding.

One of the most difficult concepts for children is finding the difference where they subtract to calculate how many more.

## Mathematical Talk

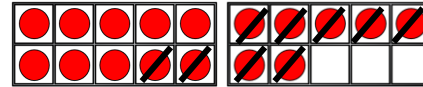
How do the counters and bar models help you to subtract?

Which method would you use to show your thinking and why?

Did you count forwards or backwards? Why?

## Varied Fluency

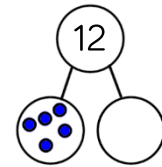
- Complete the number sentences to describe what happens to the sweets.



First there were \_\_\_ sweets.  
Then \_\_\_ sweets were eaten.  
Now there are \_\_\_ sweets.

$$\square - \square = \square$$

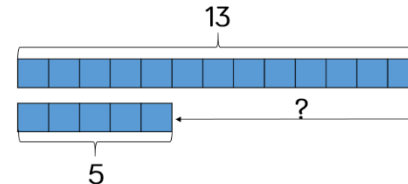
- There are 12 cars in the car park. 5 of them are blue. How many are red?



$$\square - \square = \square$$

\_\_\_ of the cars are red.

- Adam has 13 playing cards. Oliver has 5 playing cards. How many more cards does Adam have?



$$\square - \square = \square$$

# Subtraction – Crossing 10 (2)

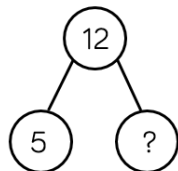
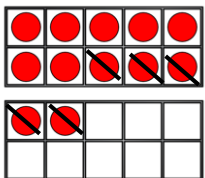
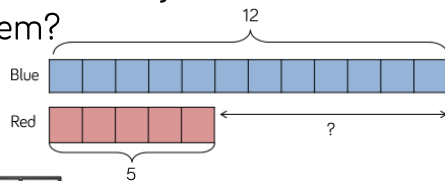
## Reasoning and Problem Solving

**A** Max has 12 balloons.  
5 of the balloons burst.  
How many are left?

**B** Max has 12 balloons.  
5 of the balloons are red.  
The rest are blue.  
How many blue balloons does Max have?

**C** Max has 12 blue balloons and 5 red balloons.  
How many more blue balloons than red balloons does he have?

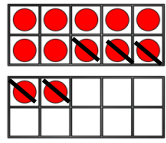
Which method would you use to solve each problem?



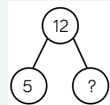
Ask the children to justify which method they would use and why.

Possible answers:

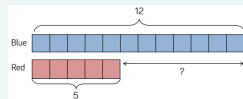
**A** Take away



**B** Partitioning



**C** Difference



Amir has 16 apples. Ron has none. Amir gives Ron 9 apples. Who has the most apples now? Explain how you know.

Ron because he has 9 and Amir only has 7 left.  
 $16 - 9 = 7$

Look at the following objects.



$15 - 4 = 11$   
(Teddy has 15 bears. He eats 4. How many are left?)

Teddy works out these calculations.

$$15 - 4 = \underline{\quad}$$

$$15 - 11 = \underline{\quad}$$

$$11 - 4 = \underline{\quad}$$

$15 - 11 = 4$  (11 are yellow how many are purple?)  
 $11 - 4 = 7$  (How many more yellow bears are there?)

What question could he have asked each time?

## Related Facts

### Notes and Guidance

Children explore addition and subtraction fact families for numbers within 20. They should work concretely and pictorially to find links between the addition and subtraction sentences. They should recognize that addition and subtraction are inverse operations.

Children should begin to understand that addition is commutative but subtraction is not.

### Mathematical Talk

What's the same and what's different?

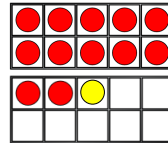
If we know  $12 + 1 = 13$ , what else do we know?

Can you see any patterns?

If we know that  $15 - 3 = 12$ , why can't we say  $3 - 15 = 12$ ?

### Varied Fluency

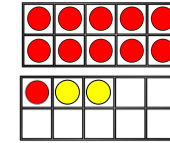
Complete the addition sentences.



$$12 + 1 = 13$$

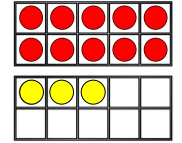
Can you write a subtraction sentence for each?

$$13 - 1 = 12$$



$$11 + \_ = 13$$

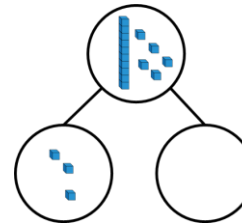
$$13 - \_ = \_$$



$$\_ + \_ = \_$$

$$\_ - \_ = \_$$

Complete:



$$15 - \_ = 3$$

$$15 - 3 = \_$$

$$3 + \_ = 15$$

$$\_ + 3 = 15$$

Complete and write addition and subtraction sentences for each bar model.

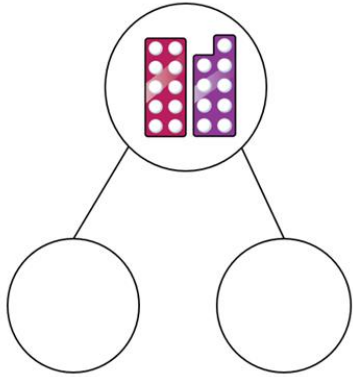


Can you use the numbers 8, 7 and 15 to make a bar model?  
Can you write addition and subtraction sentences for this bar model?

# Related Facts

## Reasoning and Problem Solving

Use the cards to write as many addition and subtraction sentences as you can.

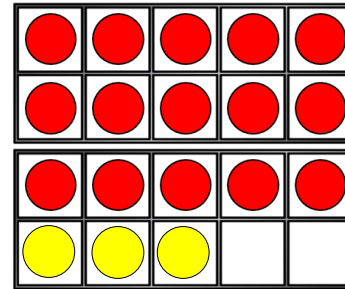


|          |             |
|----------|-------------|
| nine     | add         |
| ten      | subtract    |
| nineteen | is equal to |

Children can use the words to create sentences

Possible answers:  
 Nine add ten is equal to nineteen.  
 Nine is equal to nineteen subtract ten.

Circle the addition and subtraction number sentences that match the ten frames.



- |               |               |
|---------------|---------------|
| $15 + 3 = 18$ | $15 - 3 = 18$ |
| $3 + 18 = 15$ | $18 - 15 = 3$ |
| $18 + 3 = 15$ | $18 - 3 = 15$ |
| $18 = 3 + 15$ | $15 - 18 = 3$ |

- $15 + 3 = 18$
- $18 - 15 = 3$
- $18 - 3 = 15$
- $18 = 3 + 15$

# Compare Number Sentences

## Notes and Guidance

Children compare number sentences within 20 using inequality symbols.

Children may still need to use concrete manipulatives or draw images to help them compare calculations.

They should be encouraged to look at whether it is always necessary to have to work out the answers to calculations in order to compare them.

## Mathematical Talk

What do each of the symbols mean?

Do you always have to work out the answers to be able to compare calculations? Why?

Why might Tommy put 8 into the example below?

e.g.  $7 + 1 = \underline{\quad} - 2$

## Varied Fluency

Which card completes the number sentence?

|             |  |             |
|-------------|--|-------------|
| <br>$5 + 4$ | <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">is more than</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">is less than</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">is equal to</div> | <br>$4 + 5$ |
|-------------|--|-------------|

Use  $<$ ,  $>$  or  $=$  to compare the number sentences.

$3 + 8$    $8 + 3$

$18 - 5$    $18$

$12 + 4$    $12 - 4$

Choose the correct digit card to make the number sentences correct.

$13 - 5 < 13 - \underline{\quad}$

$16 - 4 = \underline{\quad} + 4$

$9 + \underline{\quad} > 9 + 1$



# Compare Number Sentences

## Reasoning and Problem Solving



Alex

Any number less than 11 would make this correct.

$$7 + 11 < 7 + \underline{\quad}$$

Alex is incorrect. She needs to use any number greater than 11

Do you agree with Alex?

Explain why.



Whitney has 16 sweets and eats 7 of them.



Mo has 17 sweets and eats 8 of them.

Mo and Whitney have the same.  $16 - 7$  is equal to  $17 - 8$

Who has more sweets left?

Explain how you know.



Dexter is working out which symbol to use to compare the number sentences.

$$14 - 5 \quad \bigcirc \quad 14 + 5$$

The missing symbol must be = because all of the numbers are the same.

Dexter is incorrect because when you take 5 away from 14 the answer will be smaller than when you add 5 to 14 so the correct symbol should be <

Do you agree with Dexter?

Explain why.

**White**

**Rose  
Maths**

Spring - Block 2

**Place Value (within 50)**

# Overview

## Small Steps

## NC Objectives

- Numbers to 50
- Tens and ones
- Represent numbers to 50
- One more one less
- Compare objects within 50
- Compare numbers within 50
- Order numbers within 50
- Count in 2s
- Count in 5s

Count to 50 forwards and backwards, beginning with 0 or 1, or from any number.

Count, read and write numbers to 50 in numerals.

Given a number, identify one more or one less.

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 in multiples of twos, fives and tens.

# Numbers to 50

## Notes and Guidance

Children count forwards and backwards within 50. They use a number track to support where needed, in particular crossing the tens boundaries and with teen numbers. Children build on previous learning of numbers to 20. They learn about grouping in 10s and their understanding of 1 ten being equal to 10 ones is reinforced.

## Mathematical Talk

How can we count a larger number of objects more easily.

What happens when we get to 10? 20? 30?

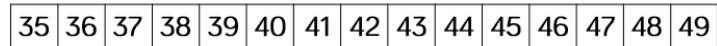
\_\_\_ ones make \_\_\_ ten.

How many groups of 10 can we see in the number \_\_\_?

Which practical equipment is best for showing groups of 10?

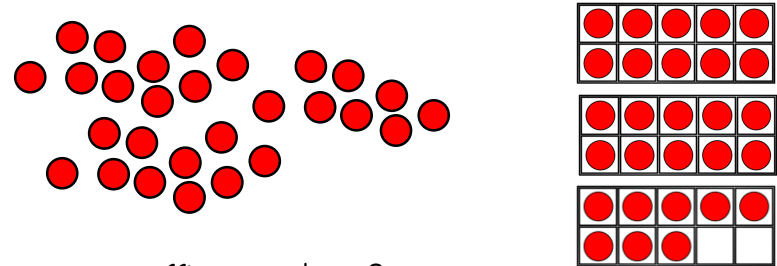
## Varied Fluency

- Use the number track to
  - count forwards from 35 to 49
  - count back from 46 to 38

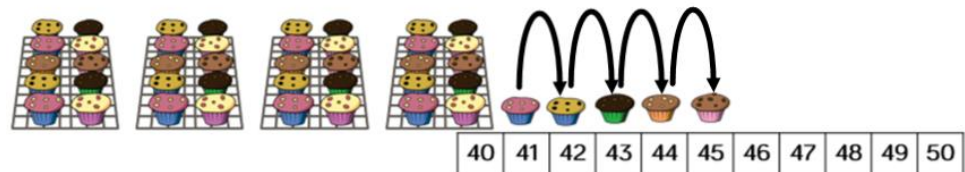


Can you count from \_\_\_ to \_\_\_ without a number track?

- These images both show the same number of counters. Which counters are easier to count? Why?



- How many muffins are there?



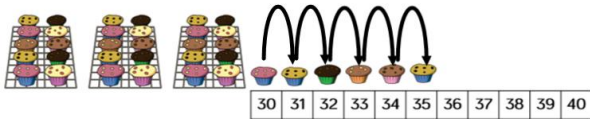
# Numbers to 50

## Reasoning and Problem Solving

Annie counts how many muffins she has.



I have 35 muffins.



Do you agree with Annie?

Explain your answer.

Possible answer:  
I do not agree with Annie because she has counted 30 twice. There should be 36 muffins.

Eva is counting from 38 to 24



Will she say the number 39?  
Will she say the number 29?  
Will she say the number 19?

Explain how you know.

Eva will not say 39 or 19 because they are not between 38 and 24  
She will say 29  
Children could show this on a number track.

Ron and Whitney are counting.

Ron says:



43, 42, 41, 40, 41, 42

Whitney writes:

10 11 12 13 41 15



Can you spot their mistakes?

Ron has started counting up after 40 when he should have continued counting back.  
Whitney has also written 41 instead of 14. She has reversed her digits.

# Tens and Ones

## Notes and Guidance

Children use practical equipment to represent numbers to 50. They continue to build their understanding that ten ones can be grouped into one ten. They need to practice grouping equipment into tens themselves (straws, cubes, lolly sticks, 10 frames) before introducing ready made tens or place value counters.

It is important that children understand how a number is made up of tens and ones, e.g.  $34 = 3$  tens and 4 ones.

## Mathematical Talk

How many have we got? How can we make them easier to count?

How many tens are there?

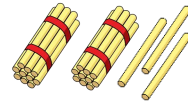
How many ones are there?

I have \_\_\_ tens and \_\_\_ ones. What number does that make?

How do we record this number in words?

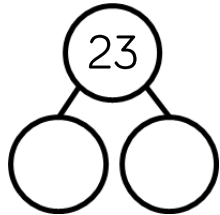
## Varied Fluency

Count out 23 straws. How many bundles of 10 can you make?



There are \_\_\_ tens and \_\_\_ ones.

\_\_\_ tens + \_\_\_ ones = 23



What number is represented in the grid?

| Tens | Ones |
|------|------|
|      |      |

There are \_\_\_ tens and \_\_\_ ones.

\_\_\_ tens + \_\_\_ ones = \_\_\_

Match the pictures and words.

- Four tens and three ones
- Two tens and five ones
- Three tens and four ones
- Three ones and five tens

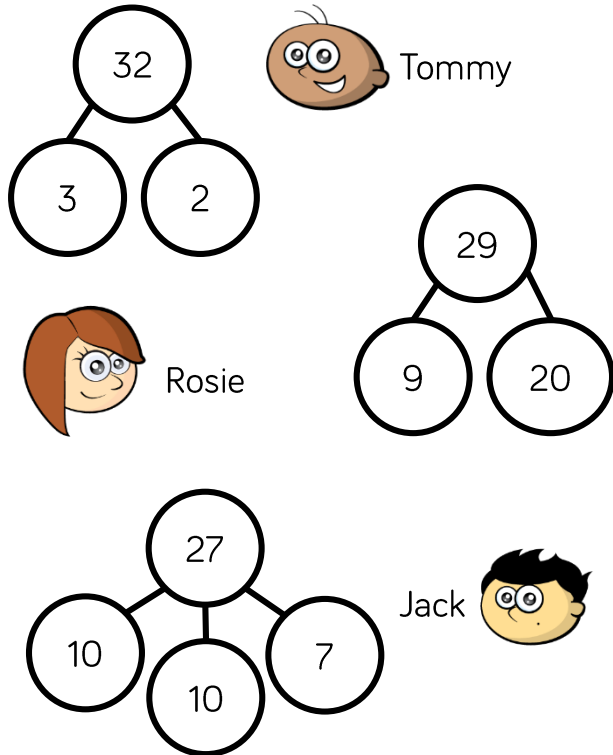
How many?

Four empty boxes for recording the number of items in each picture.

# Tens and Ones

## Reasoning and Problem Solving

The children are completing the part whole models.



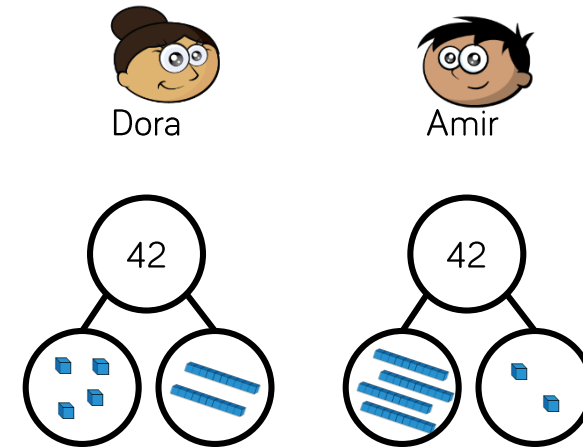
Are they correct?  
Explain why.

Tommy is wrong.  
He has wrote 3  
which should be  
30 or 3 tens.

Rosie is correct –  
she has just  
recorded the ones  
first.

Jack is correct.  
 $10 + 10 = 20$   
Two tens is the  
same as twenty.

Dora and Amir both try to build the  
same number.



Who is correct?

Can you explain the mistake that has  
been made?

Amir is correct.

Dora has got  
mixed up with tens  
and ones and  
shown 4 ones and  
2 tens (24).

# Represent Numbers to 50

## Notes and Guidance

Children continue to represent numbers to 50 using a variety of concrete materials.

Children should continue to see the groups of tens and ones in each number to support their understanding of place value.

## Mathematical Talk

Which digit represents the tens?

Which digit represents the ones?

What do you notice about the numbers 30, 40, 50?

How many tens are there? How many ones?

How do we say/write/represent/partition this number?

What's the same about your representations? What's different?

## Varied Fluency

Complete the table.

| Number | Tens and Ones      | Ten Frame | Straws | Words      |
|--------|--------------------|-----------|--------|------------|
| 26     | 2 tens<br>6 ones   |           |        | Twenty-six |
|        | __ tens<br>__ ones |           |        | Thirty     |
|        | __ tens<br>__ ones |           |        |            |
|        | __ tens<br>__ ones |           |        | Seventeen  |

How many different ways can you represent the following numbers?  
Here is an example for 25

- 34
- 28
- 40
- 16

# Represent Numbers to 50

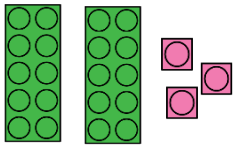
## Reasoning and Problem Solving

Sort the representations in to two groups.

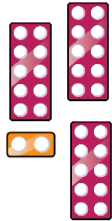


23

Three tens and 2 ones



Twenty and three



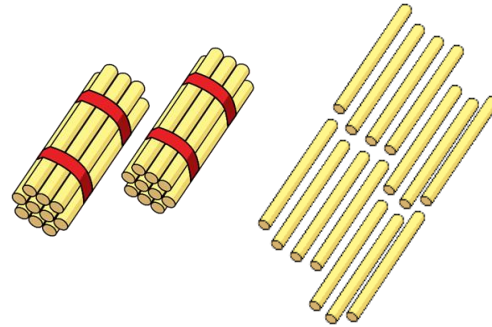
Children sort the representations in to those which show 23 and those which show 32

Whitney says,



I have 2 tens and 14 ones.

How many straws does Whitney have?



Whitney has 34  
She could also make 3 groups of ten and four ones.

Explain how you have sorted them.

Can you add your own representations?

# One More One Less

## Notes and Guidance

Children find one more and one less than given numbers up to 50. Children build numbers concretely before using number tracks and 1–50 grids. As they have already found one more and one less within 10 and 20, they should be able to use this knowledge with larger numbers. Encourage them to notice that it is the ones column that changes most of the time apart from when the ones number is a nine. If they know that 8 is one more than 7 then they also know that 48 is one more than 47

## Mathematical Talk

How many do we have? What number does this represent?  
 What would be the number after/before...?  
 What is one more/one less than...?  
 When finding one more and one less, which digit changes?  
 Why? Does this always happen?

## Varied Fluency



Fill in the blanks:

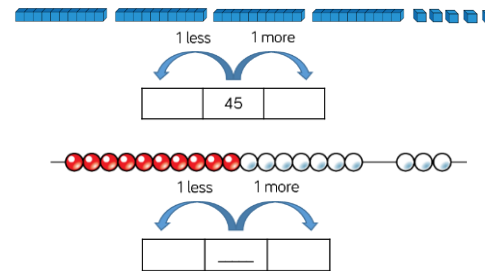


There are \_\_\_ donuts.  
 One more than \_\_\_ is \_\_\_

There are \_\_\_ donuts. One less than \_\_\_ is \_\_\_



Build and find one more and one less.



One more than \_\_\_ is \_\_\_  
 One less than \_\_\_ is \_\_\_

One more than \_\_\_ is \_\_\_  
 One less than \_\_\_ is \_\_\_



Find one more and one less:

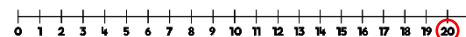
|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
|----|----|----|----|----|----|----|----|----|----|

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 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 |

One more than \_\_\_ is \_\_\_  
 One less than \_\_\_ is \_\_\_

One more than \_\_\_ is \_\_\_  
 One less than \_\_\_ is \_\_\_

One more than \_\_\_ is \_\_\_  
 One less than \_\_\_ is \_\_\_



# One More One Less

## Reasoning and Problem Solving

Always, sometimes, never...



When you find one more than a number, only the ones digit will change.

Convince me using some examples.

Sometimes.

One more than 19 is 20

The tens and ones digit has changed..

One more than 24 is 25

Only the ones has changed.

Use the clues to work out the number.

- I have a number with 3 tens.
- One less than my number makes the tens digit change.
- One more than my number has 1 one.

What is my number?

Can you make some clues to describe your secret number?

30

Choose the correct numbers to make the sentences correct.

28   26   33   45

36   43   35   49

is one less than 27

34 is one less than

is one more than 44

50 is one more than

26

35

45

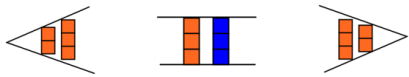
49

# Compare Objects within 50

## Notes and Guidance

Children compare two sets of objects using the language ‘more than’, ‘less than’ and ‘equal to’. Children also use the inequality symbols to compare the sets of objects.

If children are struggling to understand how to use the inequality symbols a visual may help them, for example,



## Mathematical Talk

How could we arrange the objects to help us compare them?

What do  $<$ ,  $>$  and  $=$  mean?

How do you know you have more or less?

Can you record your ideas in a different way?

## Varied Fluency

Teddy and Eva each have some muffins. Who has more muffins? Which picture helps you to compare?



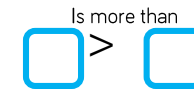
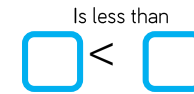
\_\_\_ is more than \_\_\_

\_\_\_  $>$  \_\_\_

\_\_\_\_\_ has more muffins.



Fill in the blanks:



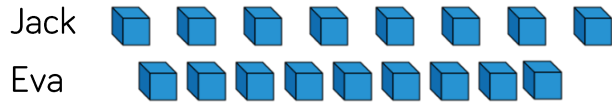
Complete each box using  $<$ ,  $>$  or  $=$ . Say and write the number sentences for each one.

|                   |  |                   |
|-------------------|--|-------------------|
|                   |  |                   |
|                   |  |                   |
| 2 tens and 8 ones |  | 3 tens and 6 ones |

# Compare Objects within 50

## Reasoning and Problem Solving

Jack and Eva are playing a game. They each collect a handful of cubes. They arrange their cubes to see who has more.



Jack says:

I have more.



Eva says:

I have more.



Who is right?  
Practise comparing objects with your friend.

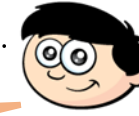
Jack looks like he has more but his cubes are spread out.

Eva has more.

This illustrates the importance of lining up the objects carefully when comparing.

Dexter compares two numbers.

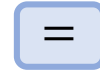
30 is less than 33



Do you agree with Dexter?

Explain your answer.

Pick a card.



Draw pictures in the boxes to make the comparison true.



Dexter is correct but he has used the wrong symbol.

Encourage children to use the correct language of 'more than', 'less than' or 'equal to'

# Compare Numbers within 50

## Notes and Guidance

Building on previous learning of comparing practical objects within 50, children now compare two numbers within 50 using the inequality symbols.

Children continue to use the language ‘more than’, ‘less than’ and ‘equal to’ alongside the correct symbols to compare numbers.

## Mathematical Talk

Which number is more? Which is less?

What could we use to represent the numbers?

What do  $<$ ,  $>$  and  $=$  mean?

How do you know you have more or less?

What could you use to help you compare?

## Varied Fluency

Use the number track to compare the two numbers using words and inequality symbols.



21 is \_\_\_\_\_ than 26

26 is \_\_\_\_\_ than 21

21  $\bigcirc$  26      26  $\bigcirc$  21

is more than   
 is less than

$>$          $<$

Use the 1-50 grid to compare the numbers.

12  $\bigcirc$  21

38  $\bigcirc$  nineteen

40  $\bigcirc$  39 + 1

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 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 |

Use a number line or 1-50 grid to compare:

fifteen  $\bigcirc$  50


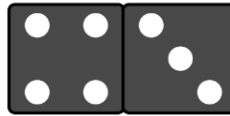
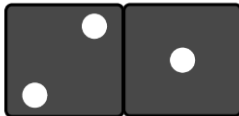
48  $\bigcirc$  39

35      28  $\bigcirc$  29

2 tens  $<$

# Compare Numbers within 50

## Reasoning and Problem Solving

|  |  |   |  |
|--|--|---|--|
| <p>Teddy is comparing two numbers.</p>  <div style="border: 1px solid blue; border-radius: 15px; padding: 5px; width: fit-content; margin: 10px auto;"> <p>My number is larger than 19 but not one more than 19</p> </div> <div style="display: flex; align-items: center; justify-content: center; margin: 20px 0;"> <div style="border: 1px solid purple; border-radius: 15px; padding: 10px 20px; margin-right: 10px;">23</div> <span style="font-size: 2em; margin: 0 10px;">&gt;</span> <div style="border: 1px solid purple; border-radius: 15px; width: 40px; height: 40px; margin-left: 10px;"></div> </div> <p>What could Teddy's number be?</p> <p>What can't it be?</p> | <p>Teddy's number could be 21 or 22<br/>It can't be 20 as this is one more than 19</p> | <p>Dora compares the two values.</p> <div style="display: flex; align-items: center; justify-content: center; margin: 20px 0;"> <div style="border: 1px solid pink; border-radius: 15px; padding: 10px 20px; margin-right: 10px;">23</div> <span style="font-size: 2em; margin: 0 10px;">&lt;</span> <div style="border: 1px solid pink; border-radius: 15px; padding: 10px 20px; margin-left: 10px;">3 tens and 3 ones</div> </div> <p>Change one thing in the values so they are equal.</p>   | <p>Dora could change <math>23 = \underline{2}</math> tens and 3 ones or <math>\underline{3}3 = 3</math> tens and 3 ones.</p> |
|  |  | <p>Pick two dominoes to represent two two-digit numbers.<br/>For example,</p> <div style="display: flex; justify-content: space-around; align-items: center; margin: 10px 0;"> <div style="text-align: center;"> <p>43</p>  </div> <div style="text-align: center;"> <p>21</p>  </div> </div> <p>Then compare them using <math>&lt;</math>, <math>&gt;</math> or <math>=</math><br/> <math>43 &gt; 21</math>   <math>21 &lt; 43</math><br/>                 Explain how you know.</p> | <p>Children could do this with a partner.</p> <p>Possible response:<br/>43 is larger than 21 as it has more tens.</p>        |

# Order Numbers within 50

## Notes and Guidance

Children order numbers using the language, 'largest', 'smallest', 'more than', 'less than', 'least', 'most' and 'equal to'. They continue to use inequality symbols to order numbers in ascending and descending order.

Children should be able to justify the order of numbers using their place value knowledge. They need to know that they should compare the highest place value column first (tens), then move onto the ones if the tens are equal.

## Mathematical Talk

Which group has the most? Which group has the least?  
 How does knowing this help us order the groups from largest to smallest?  
 Can you build the groups using equipment and compare?  
 What is the smallest/largest number that could complete the empty box?

## Varied Fluency

Order the groups of cubes from smallest to largest.

Group 1

Group 2

Group 3

Order the base 10 from smallest to largest:

<  <

Using base 10, build and order from largest to smallest:

- 23, 49, 19
- 11, 33, 22
- 41, 14, 42, 24

Use the four numbers to complete the statement.

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 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 |

>  >  >

# Order Numbers within 50

## Reasoning and Problem Solving

Spot the Mistake

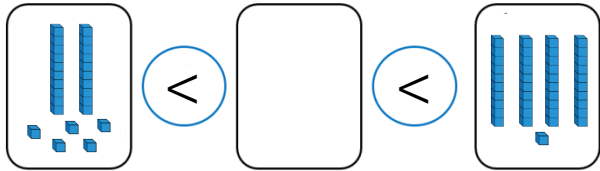
$$12 > 21 > 33 > 35$$

Can you correct it?

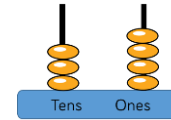
The wrong inequality symbol has been used. It should be  $12 < 21 < 33 < 35$  or  $35 > 33 > 21 > 12$

Find at least 5 different numbers that could complete the statement.

Any number from 27 to 40



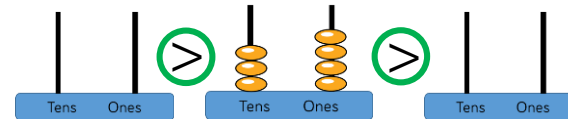
Alex has this abacus.



She uses 6 discs on each empty abacus.

Her numbers must have some tens and some ones.

Draw on the abacus what her numbers could be.



Can you find more than one answer?

- $51 > 34 > 33$
- $51 > 34 > 24$
- $51 > 34 > 15$
- $42 > 34 > 33$
- $42 > 34 > 24$
- $42 > 34 > 15$

# Count in 2s

## Notes and Guidance

Children build on their previous knowledge of counting in multiples of 2 and go beyond 20 up to 50

They will apply previous learning of one more and one less to counting forwards and backwards in twos. For example, two more than and two less than. The 1-50 grid can be used to spot and discuss patterns that emerge when counting in 2s.

## Mathematical Talk

How can we count the pairs?  
What does it mean to count in pairs?

Can we use tens frames to help us count in 2s?  
Can you see any patterns when you count in 2s?

## Varied Fluency

How many socks are there?



There are \_\_\_ socks in total.

How many gloves are there?



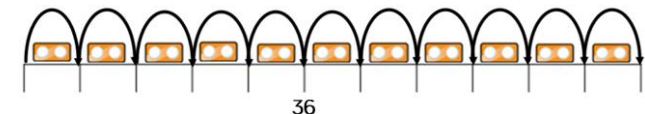
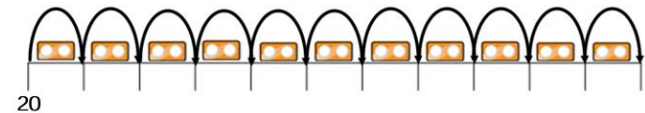
There are \_\_\_ gloves in total.

Represent the gloves using ten frames.

Continue colouring in 2s on the grid. What do you notice?

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 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 |

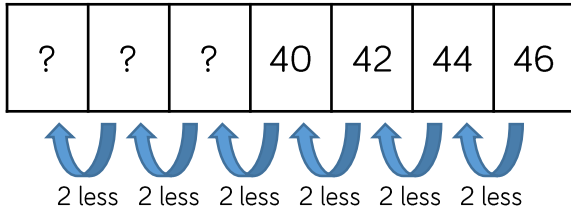
Complete the number lines by counting in 2s.



# Count in 2s

## Reasoning and Problem Solving

Count in 2s backwards to complete the number track.



If you continue counting, will you say the number 25?

Always, sometimes, never...



When you count in twos, your digits will be 0, 2, 4, 6, 8

Prove it!

38, 36, 34  
Possible answer:  
Children will not say 25 because it is not a multiple of 2, they will say 28, 26, 24 and 22

Sometimes. It depends on your starting number. For example 1, 3, 5...  
Also for 12, 14, 16, the tens digit is 1

Rosie counts back from 50 in 2s.  
Amir counts up from 12 in 2s.



50, 48, 46, 44...

12, 14, 16...



They say their numbers together.  
Who will say 30 first.

Rosie says 11 numbers to reach 30  
Amir says 10 numbers to reach 30  
So Amir will get there first.

# Count in 5s

## Notes and Guidance

Children build on previous learning of counting in fives to go beyond 20 and up to 50

The 1-50 grid can be used to spot and discuss patterns that emerge when counting in 5s.

## Mathematical Talk

How can we count the groups of 5?

Can you describe the pattern when you count in 5s?

Will \_\_\_\_\_ appear on our number line? Why/why not?

## Varied Fluency

How many fish are there?



There are \_\_\_ fish in each tank.

There are \_\_\_ tanks.

There are \_\_\_ fish altogether.

How many grapes are there?



There are \_\_\_ grapes in each bunch.

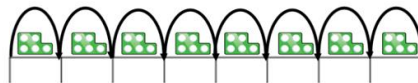
There are \_\_\_ bunches.

There are \_\_\_ grapes altogether.

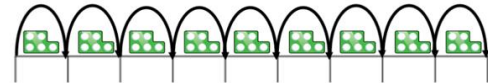
Continue counting in 5s on the grid.

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 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 |

Complete the number lines by counting in 5s.



10

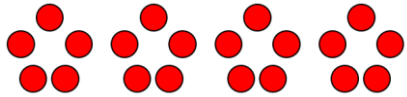


35

# Count in 5s

## Reasoning and Problem Solving

Amir is making this flower pattern with counters.



Annie says,



If you make 9 flowers, you will use 43 counters.

Do you agree with Annie?  
Explain your answer.

Annie is wrong because 43 does not end in a 5 or a 0

If she makes 9 flowers she will use 45 counters.

### Odd One Out

25

27

30

45

Which is the odd one out? Explain your answer.

27 because you would not count it if you were counting in 5s. Children also may give other responses.

Work in groups.  
Create a circle with your hands. You can choose to put in one hand or both hands.



Count how many fingers and thumbs you can see altogether.

Can you predict how many? Count to check.

Children can practise counting in 5s and recognise one hand is worth 5. They may start to spot patterns and reason about how many there will be.

**White**

**Rose  
Maths**

Spring - Block 3

**Length & Height**

# Overview

## Small Steps

- ▶ Compare lengths and heights
- ▶ Measure length (1)
- ▶ Measure length (2)

## NC Objectives

Measure and begin to record lengths and heights.

Compare, describe and solve practical problems for: lengths and heights (for example, long/short, longer/shorter, tall/short, double/half)

# Compare Lengths & Heights

## Notes and Guidance

Children use and understand the language of length such as long, longer, short, shorter, tall, taller. They recognise this language will change depending on what type of length they are describing and comparing.

Children understand that height is a type of length. They should also be exposed to lengths that are equal to one another.

## Mathematical Talk

Which person is taller/shorter?  
Which pencil is shorter/longer?

Are we measuring the height or length of something?  
What is the same? What is different?

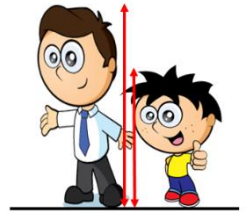
How many different sentences can you make to compare the vehicles? Say them to your partner.

## Varied Fluency

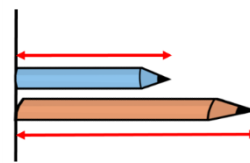
- Use the words **taller** and **shorter** in the sentence stems to compare the height of the man and the boy.

The man is  than the boy.

The boy is  than the man.



- Use the words **longer** and **shorter** in the sentence stems to compare the length of the blue pencil and the orange pencil.



The blue pencil is  than the orange pencil.

The orange pencil is  than the blue pencil.

Which pencil is the longest? Which pencil is the shortest?

- Compare the vehicles using the words to help you.

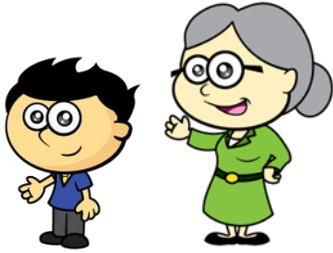


length height  
longer same  
taller shorter

# Compare Lengths & Heights

## Reasoning and Problem Solving

Rosie, Alex and Mo are comparing the height of Mrs Rose and Jack.



Rosie



Mrs Rose is tall than Jack.

Alex



Jack is short than Mrs Rose.

Mo

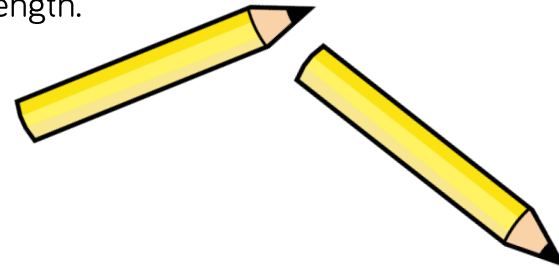


Mrs Rose is longer than Jack.

Can you improve their sentences to make them more accurate?

Possible answer:  
Rosie – Mrs Rose is **taller** than Jack.  
Alex – Jack is **shorter** than Mrs Rose.  
Mo – Mrs Rose is **taller** than Jack.  
Taller is a better word than longer because we are comparing height.

Eva thinks the pencils are the same length.



How can Eva check if she is correct?

Using classroom equipment, can you find an object which is longer than your rubber but shorter than your pencil?

Can you find a friend who is shorter than you but taller than your other friend?

Eva needs line up one end of the pencils and see which is longer.

Children could explore other items and situations where they are asked to compare more than two objects.

## Measure Length (1)

### Notes and Guidance

Children use non-standard units, such as cubes, hands and straws to measure length and height. Ensure children understand the units they use need to be of equal length. Children recognise that longer, non-standard units are more suitable for measuring the length and height of longer/taller objects. Children need to understand that non-standard units should be exactly in line with one end of the object with no gaps between them to get an accurate measurement.

### Mathematical Talk

What other things could you use to measure how long a pencil is?

What could you use to measure how tall you are? Is it easier to measure someone lying down or standing up?

What could you use to measure the length of your classroom?

Why is it important to measure in a straight line?

### Varied Fluency

- Use cubes to measure the length of objects around your classroom. Write a sentence for each object.

The pencil is  cubes long.



The  is  cubes long.

- Mr White is 5 sticks tall.  
Choose a suitable piece of equipment to measure how tall your friend is.



- Which is longer – your maths book or a lunch box?

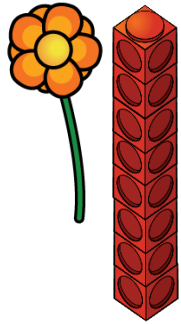
The  is longer than the .

Choose a unit to measure the objects to check you are correct.

# Measure Length (1)

## Reasoning and Problem Solving

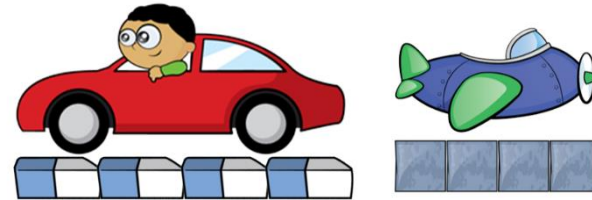
True or false?



The flower is 8 cubes tall.  
Explain your answer.

False because the cubes should be level with the bottom of the flower.  
The flower is about 6 cubes tall.

Whitney measures the length of two toys.



She says,



The toys are the same length.

Do you agree with Whitney?  
Explain your answer.

Whitney is wrong. Both toys are 4 units long, but the rubber and the cubes are different lengths so the toys are not the same length.

## Measure Length (2)

### Notes and Guidance

Children build on prior knowledge of measuring length and height using non-standard units and apply this to measuring using a ruler.

They should be able to understand that objects can vary in length and size, so a standard unit of measurement is required.

It is important that children know to measure from 0 cm.

### Mathematical Talk

What do the numbers on the ruler mean? (1 cm etc.)

Where should we place the object to start measuring it?

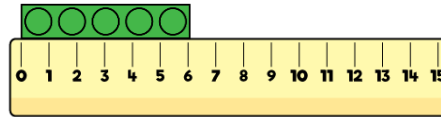
Does the ruler look like anything else we have used? (number line)

Can you count how many cm the \_\_\_\_\_ measures?

How does using a ruler help us to compare objects?

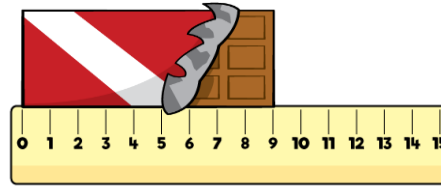
### Varied Fluency

How long is the building block?



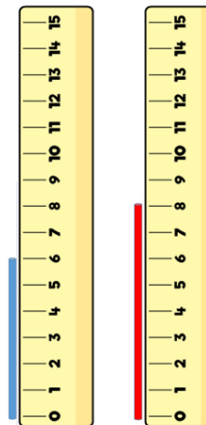
The building block is  cm.

What is the length of the chocolate bar?



The chocolate bar is  cm.

Which straw is the tallest?



The blue straw is  cm tall.

The red straw is  cm tall.

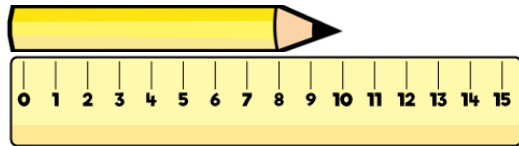
The  straw is the tallest.

The  straw is the shortest.

# Measure Length (2)

## Reasoning and Problem Solving

Teddy measures the length of the pencil.



He says,



The length of the pencil is 10 cm.

Do you agree with Teddy?  
Explain why.

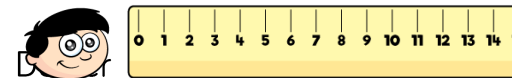
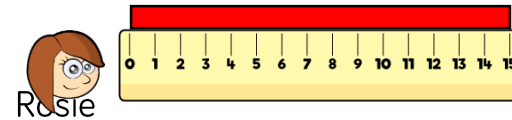
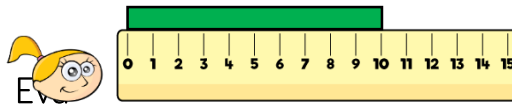
Teddy is wrong because he has started measuring from the end of the ruler not from 0

Eva, Dexter and Rosie are comparing ribbons that they have. Unfortunately, Dexter has lost his ribbon.

He says,



My ribbon is shorter than Rosie's, but longer than Eva's.



How long could Dexter's ribbon be?

Possible answers:

- 11 cm
- 12 cm
- 13 cm
- 14 cm

**White**

**Rose  
Maths**

Spring - Block 4

**Weight & Volume**

# Overview

## Small Steps

## NC Objectives

Measurement: Weight and Volume  
Measure and begin to record mass/weight, capacity and volume.

Compare, describe and solve practical problems for mass/weight: [for example, heavy/light, heavier than, lighter than]; capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]

- ▶ Introduce weight and mass
- ▶ Measure mass
- ▶ Compare mass
- ▶ Introduce capacity and volume
- ▶ Measure capacity
- ▶ Compare capacity

## Introduce Weight & Mass

### Notes and Guidance

Children are introduced to weight and mass for the first time. They may already have some understanding of heavy and light from their own experience of carrying objects. Children should begin by holding objects and describing them using vocabulary such as heavy, light, heavier than, lighter than before using the scales to check. The children may believe that larger objects are always heavier and this misconception should be explored.

### Mathematical Talk

Hold two objects, which is heavier/lighter? How do you know? How can we prove this?

Are larger objects always heavier than smaller objects?

If the balance scale is down, what does that tell us?

If the balance scale is up, what does that tell us?

If the balance is level, what does that tell us?

Which of these objects is heavier? How do you know? How will this be shown on the weighing scale?

### Varied Fluency

- Choose two objects. Which is heavier? Which is lighter? Can you be a human weighing scale? Now use the weighing scale to check.



Which object is heavier? Which object is lighter?  
The \_\_\_\_\_ is heavier/lighter than the \_\_\_\_\_ .

- Fill in the missing gaps to make the sentences correct.



The \_\_\_\_\_ is heavier than the \_\_\_\_\_.  
The \_\_\_\_\_ is lighter than the \_\_\_\_\_.  
The \_\_\_\_\_ is equal to the \_\_\_\_\_.

- Collect different objects from around your classroom. Use a balance scale to find the heaviest object. Can you find 2 objects that are equal in mass?

# Introduce Weight & Mass

## Reasoning and Problem Solving

The class are seeing whether the balloon or apple will weigh more.

Eva: The balloon will be heavier because it is bigger than the apple.

Whitney: The balance will be level because they are both red.

Mo: The apple will go down because it is lighter.

Teddy: The balloon will go up because it is lighter.

Teddy is correct. However his explanation needs to be clearer. Children should practice using vocabulary such as heavier than and lighter than when comparing objects alongside talking about the movement of the scale.

Children should be encouraged to explain why the others are incorrect.

I'm thinking of an object. It is heavier than a pencil, but lighter than a dictionary.

What object could Jack be thinking of? Prove it. How many objects can you think of?

Children will use a balance scale to find objects that are heavier than a pencil, then check that their chosen objects are lighter than the dictionary.

## Measure Mass

### Notes and Guidance

Children begin by using a variety of non-standard units (e.g. cubes, bricks) to measure the mass of an object. They see that when the scale is balanced, the number of non-standard units can be used to determine the mass. E.g. One apple weighs \_\_\_\_ bricks. Children may find that it is difficult to balance objects exactly using non-standard units. For example an object may be heavier than 3 bricks, but lighter than 4 bricks.

### Mathematical Talk

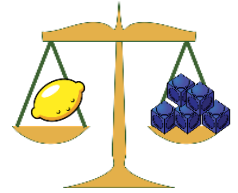
When the scales are balanced, what does this mean?  
How many \_\_\_\_ weigh the same as one \_\_\_\_?

If I add one more cube to this side, what will happen?  
How do you know? What if I take a cube away?

Which classroom objects are the best units to measure with?  
Why?

### Varied Fluency

- Use the non-standard units to measure each item on your table.



The \_\_\_\_\_ weighs the same as \_\_\_\_\_ cubes.

- Weigh an object using cubes and then weigh the same object using different non-standard units. Record your findings. What do you notice? Which non-standard unit was the best to use? Why? Which non-standard unit was not good to use? Why?

- Which non-standard units would be the best to measure the mass of a heavy book?

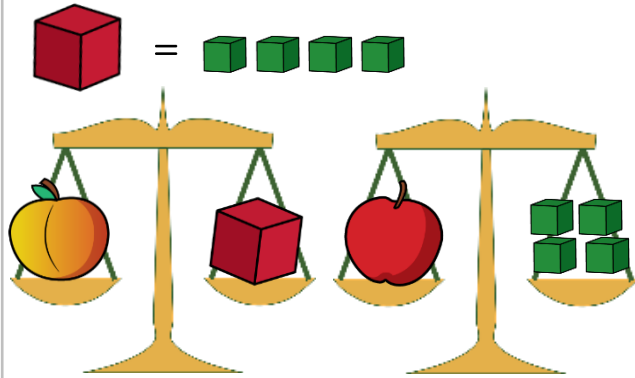


Counters  
Wooden blocks  
Pencils

Why?

# Measure Mass

## Reasoning and Problem Solving



Possible answer:  
I agree with Teddy,  
because 1 brick  
weighs the same  
as 4 cubes so the  
apple and the  
peach weigh the  
same.

Amir says,



The apple is heavier than the peach, because it weighs 4 cubes.

Teddy says,



The apple and the peach weigh the same.

Who do you agree with?  
Explain why.



The teddy bear weighs 5 cubes. I can take 1 cube off of each side of the scale and it will still balance.

How many cubes does the teddy bear weigh?  
Explain how you know.

# Compare Mass

## Notes and Guidance

Children continue to use non-standard units to weigh objects and now focus on comparing the mass of two objects. They use balance scales to compare two objects and use the language of 'heavier', 'lighter' and 'equal to'. Once children are confident using this language they can use  $<$ ,  $>$  and  $=$  to compare mass.

## Mathematical Talk

How many cubes weigh the same as \_\_\_\_\_?

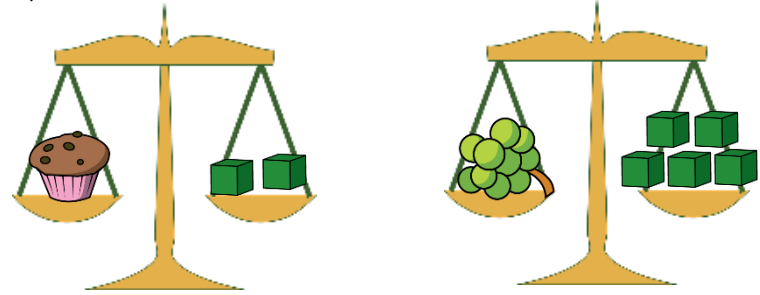
Which object is heavier? Which object is lighter?

Can we order the objects from heaviest to largest?

Explain why it is important to use the same non-standard unit if we want to compare the mass of two objects.

## Varied Fluency

Complete the sentences below.

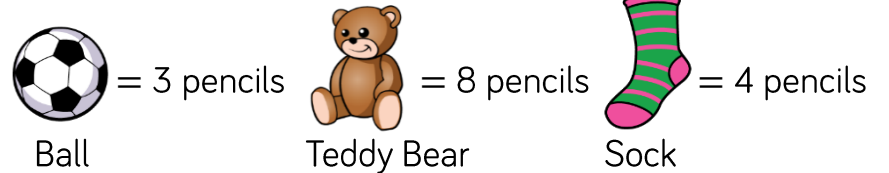


The cupcake weighs \_\_\_\_\_ cubes.

The grapes weigh \_\_\_\_\_ cubes.

The cupcake is \_\_\_\_\_ than the grapes. (*heavier/lighter*)

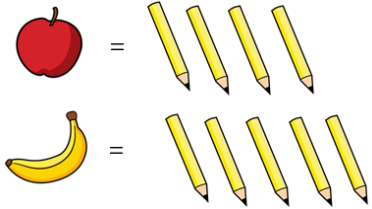
Can you order the objects from heaviest to lightest?



Using cubes, find the mass of 4 objects. Order them from lightest to heaviest.

# Compare Mass

## Reasoning and Problem Solving



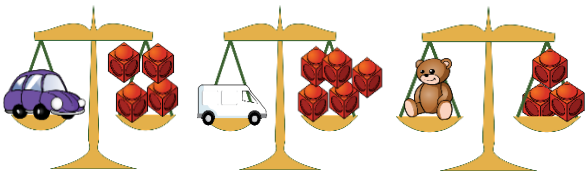
The banana is heavier than the apple.  
Children may also notice  
The banana weighs one more pencil than the apple.

Complete the sentences below:  
The \_\_\_\_\_ is heavier than the \_\_\_\_\_.  
The \_\_\_\_\_ is lighter than the \_\_\_\_\_.  
The \_\_\_\_\_ weighs \_\_\_\_ pencils.

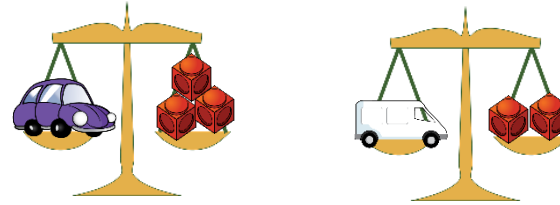
Can you match the clue to the images?

- My object weighs more than the car.
- My object is less than 5 cubes.
- My object is not the heaviest or the lightest.

- Van
- Teddy/Car
- Car



Look at the balance scales below.



Which statements are true?

- The car is heavier than the van.
- The van is heavier than the car.
- The car is lighter than the van.
- The van is lighter than the car.
- The car and van weigh the same amount.

Can you make a problem like this for your partner?

T  
F  
F  
T  
F

# Introduce Capacity and Volume

## Notes and Guidance

Children are introduced to volume and capacity for the first time.

They explore the concept in a practical way, using a variety of containers.

They compare the volume in a container by describing whether it is full, nearly full, empty or nearly empty.

## Mathematical Talk

Look at my bottle, is it full? Is it empty?

Compare my two bottles, which has more liquid in? Which has less?

How can we show the container is nearly full or nearly empty?

How can we measure the capacity of this container?

## Varied Fluency

- Provide a range of different containers for children to explore practically using water or sand.

Show me full containers.

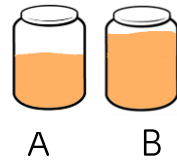
Show me empty containers.

Show me almost full.

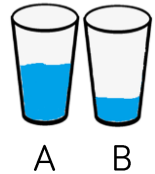
Show me almost empty.



- Use the words 'more' or 'less' to compare the containers.



A has \_\_\_\_\_ than B.



A has \_\_\_\_\_ than B.

- Put these in order from empty to full.



# Introduce Capacity and Volume

## Reasoning and Problem Solving

### Always, Sometimes, Never?

The tallest container holds the most liquid.

Identical containers can have a different capacity.

Show me.

Sometimes.

Never - If the containers are identical they will have the same capacity but they can have different volumes of liquid in.

Rosie, Teddy and Amir are describing their glasses of water.



Rosie

My glass has more water than Teddy's.

My glass is nearly full.



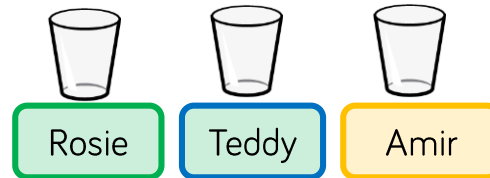
Teddy



Amir

My glass has less water than Rosie's.

Can you fill in how much water could be in each of the children's glasses?



Various representations for Rosie's and Amir's as long as they show that Amir's is less than Rosie's and Rosie's is more than nearly full.

# Measure Capacity

## Notes and Guidance

Children measure the capacity of different containers using non-standard units of measure. They understand that the unit of measure must stay the same, for example the same cup, the same spoon etc.

They understand to measure accurately, they must make each container or non-standard measure full.

## Mathematical Talk

How can we measure how much liquid will fill my container?

What could I use?

How many bowls of liquid fill the bottle?

How many cups of liquid fill the bottle?

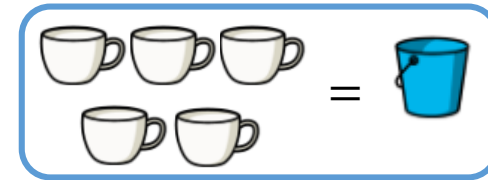
How is this different? How is this the same?


## Varied Fluency

- Work practically using a variety of containers. Investigate how many small containers it takes to fill the larger containers.

The capacity of the \_\_\_\_\_ is \_\_\_\_\_ pots.

- It takes 5  to fill 1 



How many  will it take to fill 2 buckets?

What about three buckets?

Four buckets?

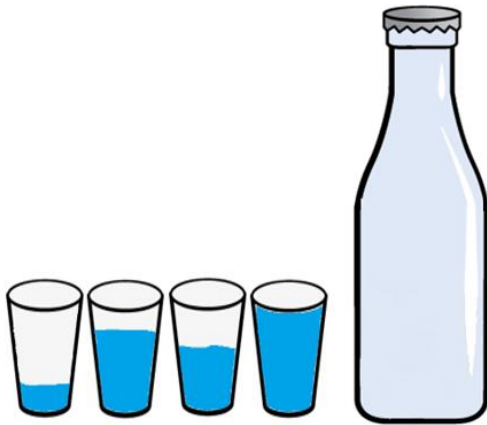
What do you notice?

Can you continue the pattern?

# Measure Capacity

## Reasoning and Problem Solving

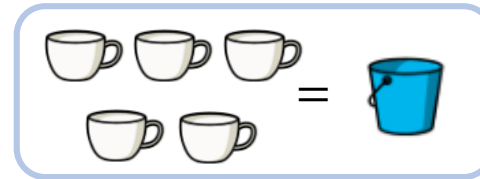
Whitney pours her cups into the bottle and they fill it exactly.



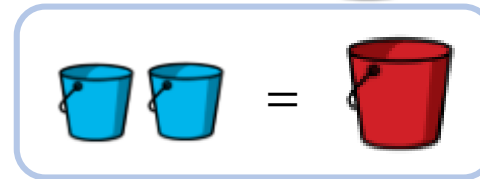
She says the bottle has a capacity of four cups. Do you agree?

Whitney is wrong. She has not filled the cups to the top so her measuring is inaccurate.

It takes 5 to fill 1



It takes 2 to fill 1



How many will fill one ?

What else can you find out?

10 cups will fill one red bucket.

The children may also find that it will take 20 cups to fill 2 red buckets etc.

# Compare Capacity

## Notes and Guidance

Children compare the capacity of different containers using non-standard units of measure.

They use 'more', 'less' and 'equal to' to compare as well as the symbols  $<$ ,  $>$  and  $=$ .

## Mathematical Talk

Which container has the largest/smallest capacity?  
Can we order them from largest to smallest?

Which container do you think will hold more?  
How can we check?

What can we use to measure the capacity of these containers?

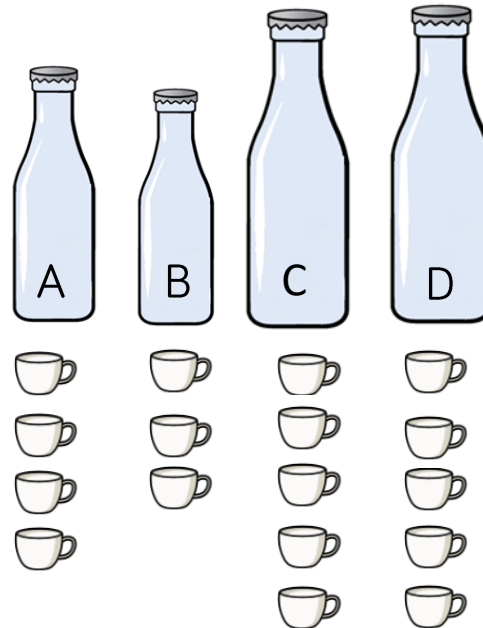
Can we show A has more than B but less than C?

## Varied Fluency

- Take three different containers. Fill each container with liquid or rice using the same unit of measure e.g. A small cup.

Order the containers from largest to smallest capacity.

- Complete the boxes to compare the capacity of the bottles:

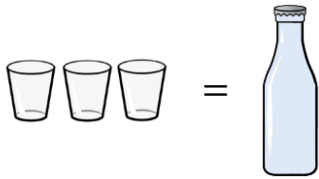


|                      |     |                      |
|----------------------|-----|----------------------|
| <input type="text"/> | $>$ | <input type="text"/> |
| <input type="text"/> | $<$ | <input type="text"/> |
| <input type="text"/> | $=$ | <input type="text"/> |

# Compare Capacity

## Reasoning and Problem Solving

If



Circle whether the glasses or bottles hold more in each row:

|   |  |  |
|---|--|--|
| A |  |  |
| B |  |  |
| C |  |  |

|   |  |  |
|---|--|--|
| A |  |  |
| B |  |  |
| C |  |  |

Alex has a bottle of juice. She pours three glasses of juice.



The bottle holds exactly three glasses of juice.



Do you agree? Explain why.

Choose three containers. Investigate how you could compare the capacity of each one.



I disagree. Alex has filled three glasses exactly but there is still juice left so she could have filled more than 3

Children choose three containers and choose a unit of measure to compare the containers' capacities.