Autumn Scheme of Learning

Year 1

#MathsEveryoneCan

2020-21

White Rose Maths

New for 2020/21

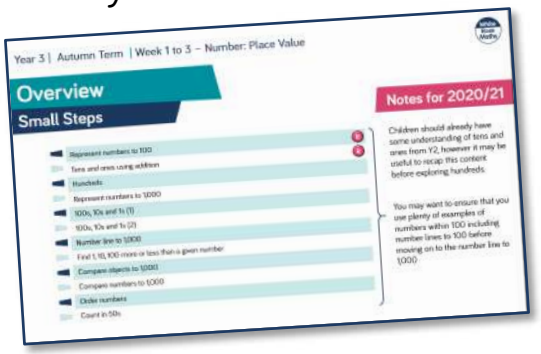
2020 will go down in history. The world has changed for all of us.

We want to do as much as we can to support children, teachers, parents and carers in these very uncertain times.

We have amended our schemes for 2020/21 to:

- ★ highlight key teaching points
- ★ recap essential content that children may have forgotten
- ★ flag any content that you might not have covered during the school closures period.

We hope these changes will add further value to the schemes and save you time.



Lesson-by-lesson overviews

We've always been reluctant to produce lesson-by-lesson overviews as every class is individual and has different needs. However, many of you have said that if blended learning becomes a key feature of school life next year, a weekly plan with linked content and videos could be really useful.

As always, we've listened! We've now produced a complete lesson-by-lesson overview for Y1 to Y9 that schools can use or adapt as they choose. Each lesson will be linked to a free-to-use home learning video, and for premium subscribers, a worksheet. This means that you can easily assign work to your class, whether they are working at home or in school.

Inevitably, this lesson-by-lesson structure won't suit everyone, but if it works for you, then please do make use of this resource as much as you wish.

Teaching for Mastery

These overviews are designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the new National Curriculum.

The overviews:

- have number at their heart. A large proportion of time is spent reinforcing number to build competency
- ensure teachers stay in the required key stage and support the ideal of depth before breadth
- ensure students have the opportunity to stay together as they work through the schemes as a whole group
- provide plenty of opportunities to build reasoning and problem solving elements into the curriculum.

For more guidance on teaching for mastery, visit the NCETM website:

https://www.ncetm.org.uk/resources/47230

Concrete - Pictorial - Abstract

We believe that all children, when introduced to a new concept, should have the opportunity to build competency by taking this approach.

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – alongside this children should use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support children's understanding of abstract methods.

Need some CPD to develop this approach? Visit www.whiterosemaths.com for find a course right for you.

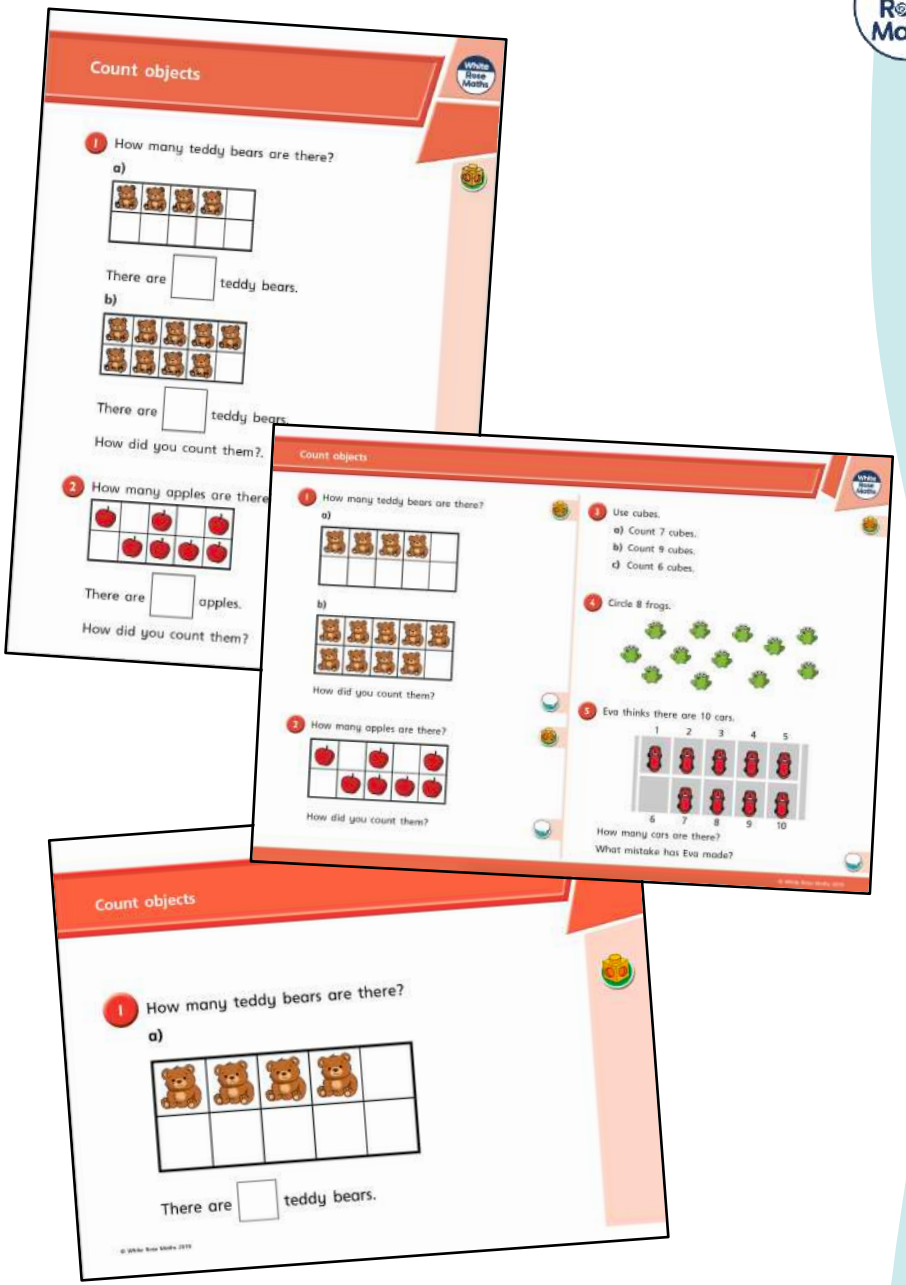
Supporting resources

We have produced supporting resources for every small step from Year 1 to Year 11.

The worksheets are provided in three different formats:

- Write on worksheet – ideal for children to use the ready made models, images and stem sentences.
- Display version – great for schools who want to cut down on photocopying.
- PowerPoint version – one question per slide. Perfect for whole class teaching or mixing questions to make your own bespoke lesson.

For more information visit our online training and resources centre resources.whiterosemaths.com or email us directly at resources@whiterosemaths.com



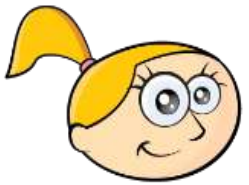
Meet the Characters

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

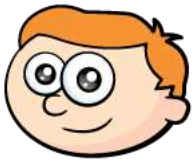

Whitney


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)	
Spring	Consolidation	Number: Addition and Subtraction (within 20)			Number: Place Value (within 50)			Measurement: Length and Height		Measurement: Weight and Volume		Consolidation
Summer	Consolidation	Number: Multiplication and Division			Number: Fractions		Geometry: Position and Direction	Number: Place Value (within 100)		Measurement: Money	Measurement: Time	

White Rose Maths

Autumn - Block 1

Place Value

Overview

Small Steps

- Sort objects
- Count objects
- Represent objects
- Count, read and write forwards from any number 0 to 10
- Count, read and write backwards from any number 0 to 10
- Count one more
- Count one less
- One-to-one correspondence to start to compare groups
- Compare groups using language such as equal, more/greater, less/fewer
- Introduce <, > and = symbols
- Compare numbers
- Order groups of objects
- Order numbers
- Ordinal numbers (1st, 2nd, 3rd ...)
- The number line

Notes for 2020/21

The importance of early number and early understanding of mathematics cannot be underestimated. With the learning of reception children being disrupted, we've decided to put a bit more time early in Year 1 on numbers to 10, particularly around place value and the introduction to the concept of parts and wholes.

Devote more time to this block if needed before moving on and continue to revisit difficult concepts such as comparing numbers.

Sort Objects

Notes and Guidance

Children need to sort groups by characteristics before they count. Children should be encouraged to sort objects into groups in a variety of ways, for example, sorting a group of children into girls and boys or sorting counters by colour.

Children should be encouraged to line sorted objects up to link to the early representations of bar models.

Mathematical Talk

How can you sort the objects?

Are there any different ways they could be sorted?

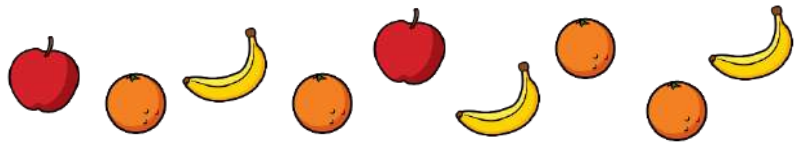
How have you grouped the objects?

How do you think these objects have been grouped?

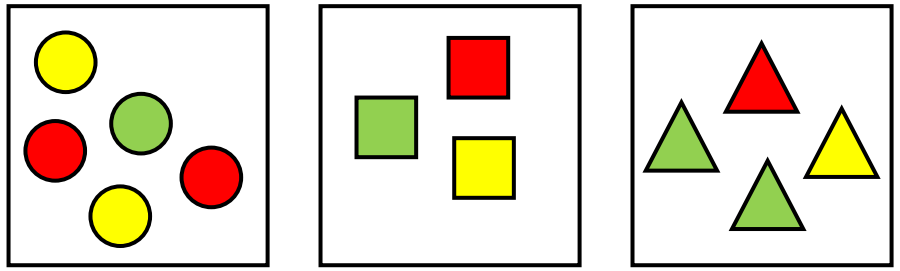
Can there be more than 2 groups?

Varied Fluency

- Sort the fruit into groups and explain how you have sorted them.



- How many ways can you sort the children into groups?

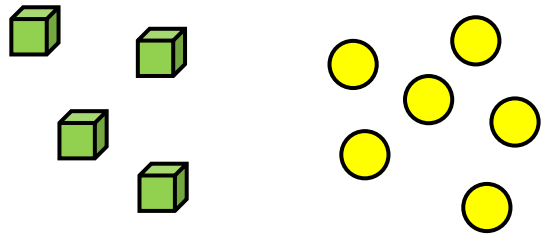
- 

How have these objects been grouped?
How else could you group them?

Sort Objects

Reasoning and Problem Solving

Two children are discussing how some objects have been sorted.



Dora

These objects have been sorted into cubes and counters.

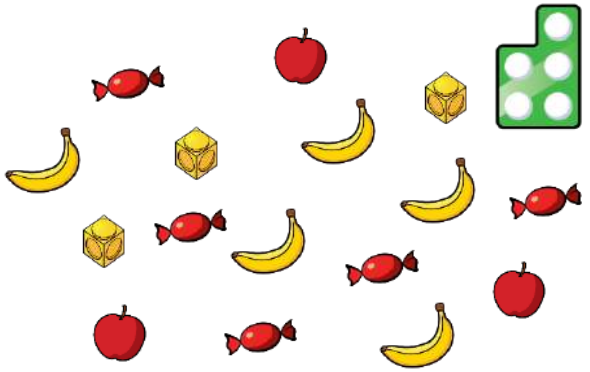
These objects have been sorted into green and yellow.

Jack

Who is correct? Convince me.

Both children could be correct as all of the cubes are green and all of the counters are yellow so it could have been sorted as either cubes and counters or green and yellow.

How many different ways can the objects be grouped?



They could be sorted into:

- Colours
- Food and not food
- 5s and 1s

Count Objects

Notes and Guidance

Once objects are sorted, children begin to count from 1 to 10 to work out how many there are.
It is important that they count one object at a time and that they understand the last number they count is the total amount.
Children should be encouraged to place the objects in a line to improve accuracy when counting. They should also be exposed to what zero looks like.

Mathematical Talk

Line up the objects. Is it easier to count now? Why?

What does one _____ represent?

What number will we say first when we are counting? Why?

How many are there in total?

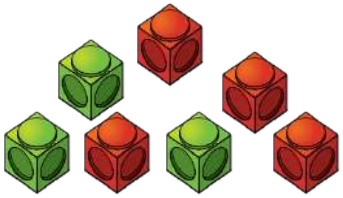
When would we count 0?

What does zero look like?

Can you show me a group of zero?

Varied Fluency

How many red cubes and how many green cubes are there?

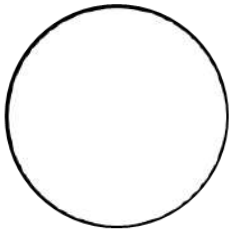


There are _____ red cubes.

There are _____ green cubes.

There are _____ cubes altogether.

Match the numbers to the correct amount of teddies.



3 1 0

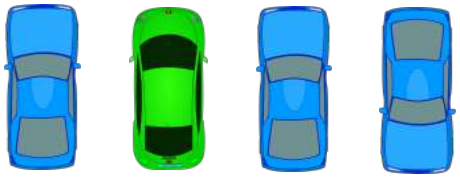
Group the items, and then count how many there are in each group. Compare your groups with a partner's.

Count Objects

Reasoning and Problem Solving

Eva has grouped these cars into 3 groups.

One group has 3 cars.
One group has 1 car.
One group has no cars.



How could Eva have grouped the cars?

Eva could have grouped the cars by colour e.g. Blue cars, green cars and red cars. There would be zero cars in the red group.

Eva could have grouped the cars by the way they are facing e.g. Facing forward, facing backwards and facing sideways. There would be zero cars in the sideways group.

How many different ways can you find to group the objects and find the total?

They can be grouped by:

- Colour
- Ringed & not ringed
- Sprinkles and no sprinkles.

There are 9 doughnuts in total.

Represent Objects

Notes and Guidance

Children learn that one object can be represented by another. For example, one elephant can be represented by one cube or counter.
Children can also pictorially represent an object to aid understanding. The use of zero is important so children understand what zero means.
Although the use of numerals is modelled here, you could also introduce the written word too.

Mathematical Talk

How can the five frame help you to count the objects?

Can you write the number 3 in words?

How many ways can you draw 3?

Do we always have to use counters to show an amount?

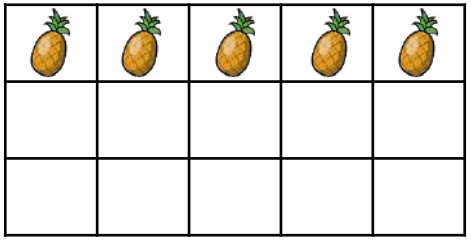
What can we use to represent the _____?

What does each _____ represent?

How many different ways can we represent _____?

Varied Fluency

- Using counters, show how many pineapples there are, then write the numerals for each.



- How many whales can you see on the wrapping paper?
Place counters on the whales to help you.
What else can you count?
Which animal is represented the most?
Which animal is represented the least?

- Complete the table.

Picture	Draw It	Number	Write It
			

Represent Objects

Reasoning and Problem Solving

How many ways can you represent 6 apples?

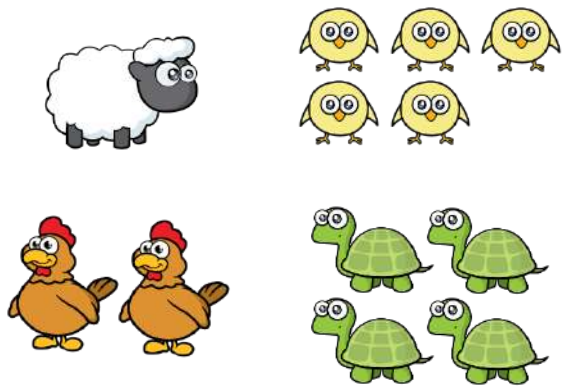
Can you show me fewer than 4 sweets? How many ways can you do this?

How can you show me that there are more green cars than blue cars?

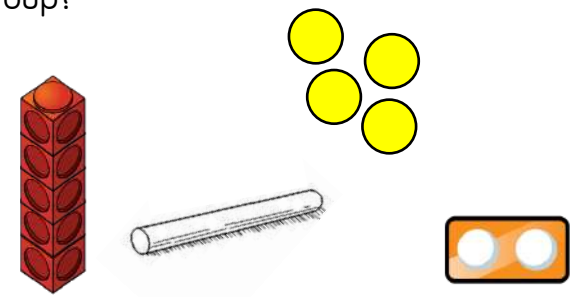
Children could line up 6 counters/cubes.

Children could line up 3, 2, 1 or get zero counters.

Children could get 1 blue cube and 2 green cubes etc.



Which representation matches which group?



Explain how you know.

Cubes represent chicks.
Counters represent turtles.
The number shape represents the hens.
The straw represents the sheep.

Count Forwards

Notes and Guidance

Children develop counting to continue a number sequence forwards. Problems should be presented in a variety of ways e.g. numerals, words and images. Children should be able to find consecutive and non-consecutive missing numbers in sequences.

When counting a set of objects, children need to be able to visualise what zero looks like and know that this comes before one.

Mathematical Talk

What can we use to represent the strawberries?

Do we always have to count from 0 or 1?

Can anything in our classroom help you with the words? (on a number line/working wall ensure words are matched with the numeral)

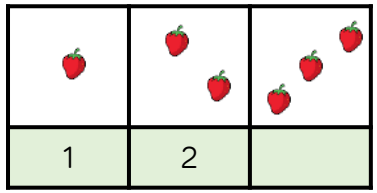
Are the numbers getting greater or smaller?

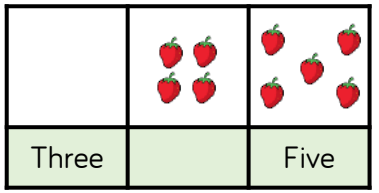
What is the next number?

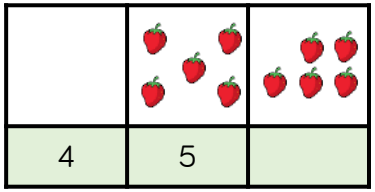
Can you use the resources or images to help you count?

Varied Fluency

Complete the number tracks.







Complete the number tracks.

1		3	4	5	6		8	9	10

one		three	four	five	six		eight	nine	ten

Fill in the missing numbers.

____, 1, 2, 3

1, ____, 3, ____

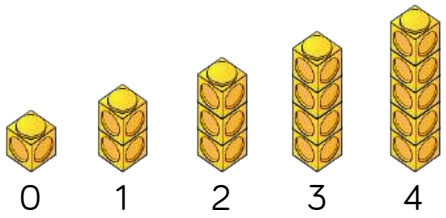
3, 4, ____, 6

six, _____, _____, nine

Count Forwards

Reasoning and Problem Solving

Spot the mistakes, and correct the sequences.

- 0, 2, 3, 4, 5
- 

- 1 

  2 

  3 

- Missed out '1' The sequence should be 0, 1, 2, 3, 4, 5
- The sequence starts from 0 whereas the number of cubes starts from 1
- The number of cubes doesn't match the sequence.

Whitney says,

When counting forwards, we always count from 0

Do you agree?
Explain why.

Whitney is wrong, we can start counting forwards from any number.

Count Backwards

Notes and Guidance

Children develop counting to continue a number sequence backwards. Problems should be presented in a variety of ways, e.g. numerals, words and images.

Children should continue sequences, and also find consecutive and non-consecutive missing numbers in sequences.

Mathematical Talk

How can we use our counting skills?

Do we always have to start at 10 when counting backwards?

Will all the boxes have dots in?

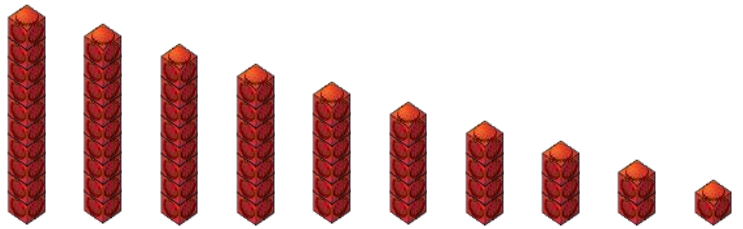
Are the numbers getting greater or smaller?

What comes before ____?

Can you use the manipulatives and images to help you count?

Varied Fluency

Write the numerals to match the cubes.
Can you describe the pattern?

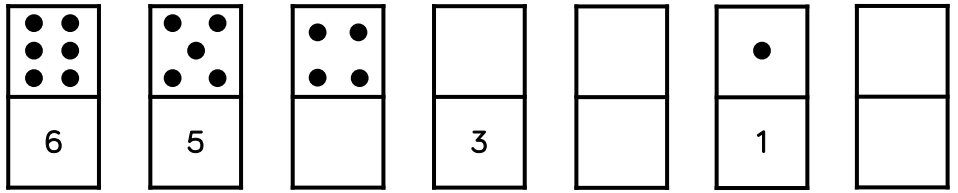


Complete the number tracks.

10		8	7	6			3	2	1

ten	nine	eight		six		four	three	two	

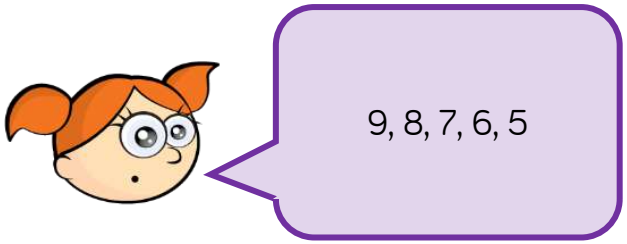
Fill in the empty boxes.



Count Backwards

Reasoning and Problem Solving

Alex is counting.



How do you know that Alex is counting backwards?

Alex is counting backwards because the numbers are getting smaller.

Children could show this using concrete manipulatives.

How many different starting points could you have if you wanted to count backwards and stop at 3?

There are 7 different possibilities within 10

10, 9, 8, 7, 6, 5, 4, 3

9, 8, 7, 6, 5, 4, 3

8, 7, 6, 5, 4, 3

7, 6, 5, 4, 3

6, 5, 4, 3

5, 4, 3

4, 3

Count One More

Notes and Guidance

Once children are confident placing numbers on a track, the language of one more can be introduced.
Children need to know that one more is the number after and they should use their counting skills or a number track to help them.
The use of a dice and dominoes should be used to reinforce subitising skills.

Mathematical Talk

How can counting help us with finding 1 more?

Where can one more than _____ be found on a number track?

What does one more mean?

Will the number get greater or smaller? Why?

How can we show one more?

Do we need to count from 0 every time we find one more?

Varied Fluency

- Complete each box using a picture, a numeral and a word.


one more → ☐

3 one more → ☐

six one more → ☐

- Roll a dice, represent the number using counters on a track, and add 1 more. Then complete the sentences.

1 more than _____ is _____

_____ is one more than _____

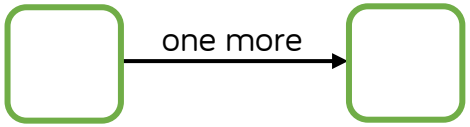
- Choose a number card from 0 to 9 then complete the table.

Number in numerals	Number in words	Number track
Sentence: One more than _____ is _____		

Count One More

Reasoning and Problem Solving

Using number cards 0 to 10, how many different ways can you complete the boxes below?



Look to see if children are working systematically, e.g. 1 and 0, then 2 and 1 etc.

Teddy rolls the number that is 1 more than the dice below.

He says that he rolls 2

Explain his mistake.

2 is smaller than 3 and when we find one more the number gets bigger.

Mo says,

I am one year older than my sister.

My sister is one year older than my brother.

My brother is 7

How old is Mo?
Who is the oldest?
Explain why.

His sister is 8 because she is one more than 7

Mo is 9 because he is one more than 8

Mo is the oldest because 9 is bigger than 7 and 8

Count One Less

Notes and Guidance

Children should relate one less to one more and understand that it is the opposite.

It should be made clear that 1 less is the number before the starting number.

The use of dice and dominoes should be used to reinforce subitising skills.

Mathematical Talk

How can counting help us with finding 1 less?

Where can 1 less than _____ be found on a number track?

What does one less mean?

Will the number get greater or smaller? Why?

How can we show one less?

Varied Fluency

- Complete each box using a picture, a numeral and a word.


one less → ☐

1 one less → ☐

nine one less → ☐

- Roll a dice, represent the number using counters on a track, and find 1 less. Then complete the sentences.

1 less than _____ is _____

_____ is one less than _____

- Choose a number card from 1 to 10 then complete the table.

Number in numerals	Number in words	Number track
		☐☐☐☐☐☐☐☐☐☐
More than sentence		Less than sentence

Count One Less

Reasoning and Problem Solving

True or False?

One more than 7 is the same as 1 less than 9

Use a number track to help you.

Can you think of another statement like this?

It is true because one more than 7 is 8, and one less than 9 is also 8

Other example could be: 1 more than 5 and 1 less than 7 are the same.

Complete the sentence stems.

One less than 9 is _____

One less than _____ is 7

One less than _____ is 6

What pattern do you notice with the numbers?

What would the next sentence be?

8
8
7

The numbers are counting backwards and children should recognise that one less than any number is the number before it when counting.

The next sentence would be:
'one less than 6 is 5'

One-to-One Correspondence

Notes and Guidance

Children match one object with another. Children should be exposed to situations where there are too many, not enough or just the right amount.

Children do not need to know the exact difference between the groups.

Mathematical Talk

How can we show we've matched the objects/images?

What does match mean?

What can we use to represent the sweets, to show each person has one each?

Are there enough objects/images to match them all up?

Are there any left over? Why has that happened?

Varied Fluency

- Are there enough bowls for the bears? Draw lines to check.

- Draw sweets for each child so they all get 1 each.

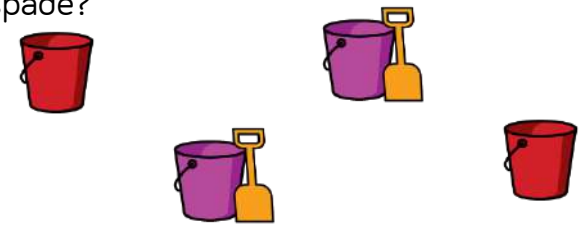
- Six children are going to the beach.
  Are there enough caps for everyone?

If not, how many more caps are needed?

One-to-One Correspondence

Reasoning and Problem Solving

There are four children going to the beach.
Can every child have a bucket and spade?



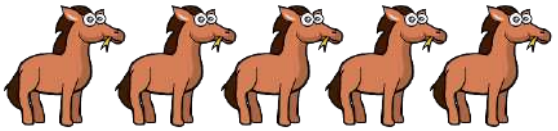
If not, why not?

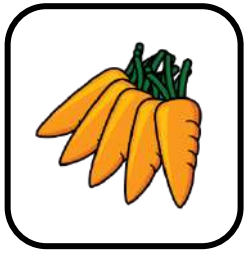
No, there are enough buckets for one each but not enough spades.

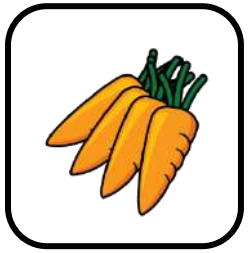
Can the family all travel in a 5 seater car?
Explain how you know.

Yes. There are 5 seats and 4 people.

Which group of carrots matches the number of horses?
Explain why.







There are 5 horses, so the box with 5 carrots in matches the horses.

Compare Objects

Notes and Guidance

Children use the language 'equal to', 'more', 'less', 'greater than', 'fewer' and 'less than' to compare groups of objects.

Children do not need to know the difference between the groups, just that one group is greater or less than another or that the groups are equal to each other.

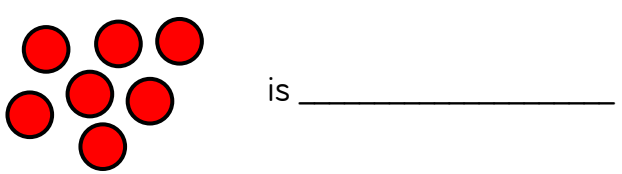
Mathematical Talk

Can you compare the same objects using the word 'fewer' and then using the word 'more'?
Is there more than one answer?
How many answers can you find?
What do you notice about the numbers or amounts that are less than/fewer?
How can you tell which has the least/most?
What does 'more/greater than' mean?
What does 'less/fewer than' mean?
What does 'is equal to' mean?

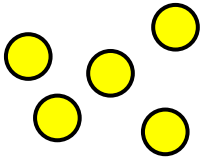
Varied Fluency

- Circle the picture with more trees.

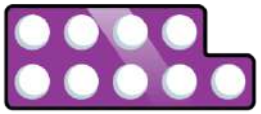
- Use **greater than**, **less than** or **equal to**, to complete the sentences.



is _____



is _____

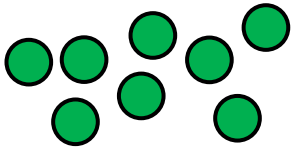


- Draw counters in the box to represent the sentence.

Eva has fewer counters than Tommy.

Eva's counters

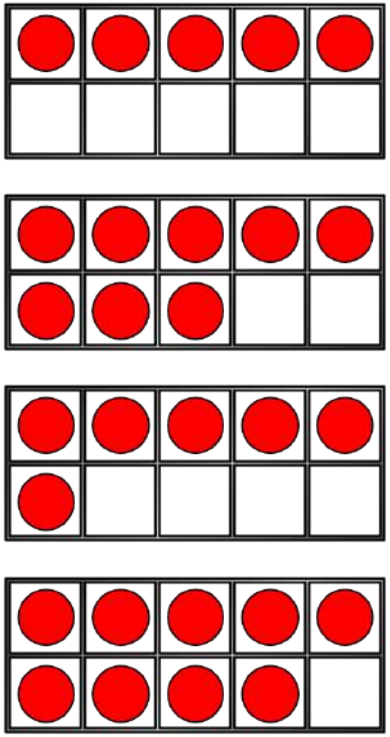
Tommy's counters



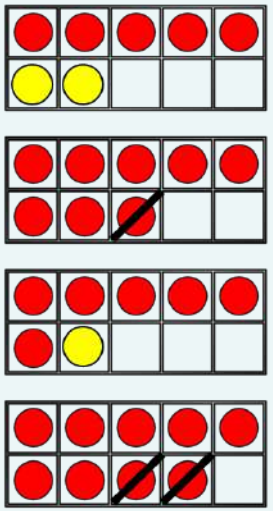
Compare Objects

Reasoning and Problem Solving

Move **three** counters so that all the ten frames show the **same** amount.



Create your own problem like this.



Whitney has this many cubes in one hand.

She has fewer cubes in the other hand.

How many cubes could she have in her other hand?

She could have:
4 cubes
3 cubes
2 cubes
1 cube
0 cubes.

Introduce <, > and =

Notes and Guidance

Inequality symbols are not introduced in the National Curriculum until Year 2. However, it is a good opportunity to introduce them when working with smaller numbers and concrete materials.
For example:

Mathematical Talk

Which symbol shows 'greater than'?

Which symbol shows 'less than'?

Which symbol shows 'is equal to'?

Is _____ greater than, less than or equal to _____?

How can we show that using words?

What can we use to represent the seven, to help us compare the two amounts?

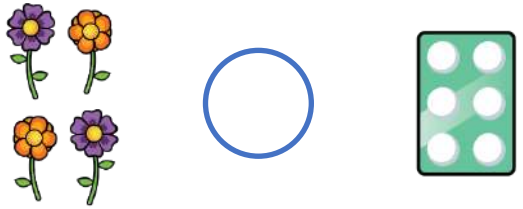
Varied Fluency

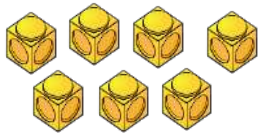
- Draw the symbols around the cubes to show greater than, equal to or less than.

- Use cubes to show that,

$3 < 4$
$6 > 2$
$5 = 5$

- Use <, > or = in each circle to make the statement correct.





Seven

Introduce <, > and =

Reasoning and Problem Solving

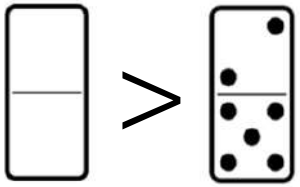
Circle all the numbers from the track that **cannot** go in the box. Explain why.

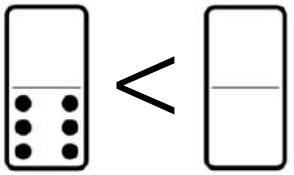
$6 < \square$

1	2	3	4	5	6	7	8	9

6, 5, 4, 3, 2, 1 because 6 < means '6 is less than', so the other number needs to be greater than 6.

Complete the blank dominoes.

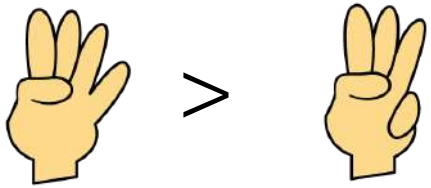




The first blank domino should have more than 7 dots.
The second blank domino should have 7 or more dots.

Game

- Both children make a fist.
- On 3, show some fingers.
- Use <, > or = to compare.



This game can be extended to develop fluency. To extend:

- Can we move places to change the sign?
- How can we change fingers to use the '=' sign?
- Can we use two hands each?

Compare Numbers

Notes and Guidance

Children use previous learning to choose an efficient method to compare numbers. They will use their understanding of a number's value to compare them.
Children may draw on prior knowledge such as counting, sorting, grouping etc. to help them compare.
Children should be given access to a variety of concrete resources and images to support them.

Mathematical Talk

What happens to the sign when you swap the numbers around?
Will zero always be the smallest?
What strategies did you use?
Which number is the largest? How do you know?
Which number is the smallest? How do you know?
Which symbol represents _____?
How can you describe these two numbers?

Varied Fluency

Here are two number cards.

Use resources to make these numbers. Which is greater? Can you use a number track to check your answer?

1	2	3	4	5	6	7	8	9	10

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

5 ◯ 6

8 ◯ 1

10 ◯ 0

Choose your own numbers to complete the statements.

_____ < _____ _____ > _____ _____ = _____

Compare Numbers

Reasoning and Problem Solving

One of these statements is incorrect. Use cubes to prove which one. $8 > 4$ $7 < 10$ $3 > 6$	$3 > 6$ is incorrect.
Using number cards 0 – 10, how many ways can you make the statement correct? _____ is more than _____	Numerous answers. Check if children are working at random or working systematically.

Children should roll two dice and fill in their total in blank boxes. They should then choose the correct inequality symbol to compare their numbers.

Order Objects

Notes and Guidance

Children should order three groups of objects. They should be exposed to different methods for comparing such as comparing two groups initially, and lining groups up.

Children should be introduced to the vocabulary 'greatest' and 'smallest' and begin to use it correctly.

Mathematical Talk

How did you compare the piles or groups?

How do you know group _____ is the greatest?

How do you know group _____ is the smallest?

Group _____ has the greatest amount of _____

Group _____ has the smallest amount of _____

Varied Fluency

- Grab a small handful of counters and put them in **three** piles. Order the piles from greatest to smallest.

- Order the groups of cars from greatest to smallest.

Group 1 

Group 2 

Group 3 

- Complete the statements.

___ ice creams

___ ice creams

___ ice creams

The smallest amount of ice creams is _____

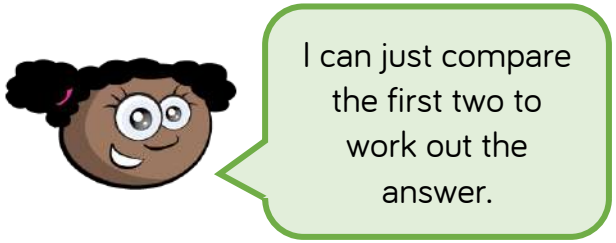
The greatest amount of ice creams is _____

Order Objects

Reasoning and Problem Solving

Whitney is ordering the amount of spots on these three ladybirds, from the greatest amount of spots to the least.

She says,



Do you agree? Explain why.

No, she needs to know how many spots are on the third ladybird to correctly place them all.

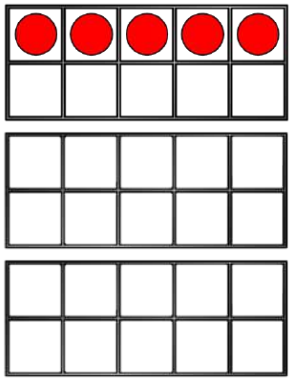
Jack has 6 sunflowers.
Rosie has more sunflowers than Jack.
Amir has more sunflowers than Rosie.

Who has the least amount of sunflowers?

Jack has the least amount of sunflowers.

Draw counters on the ten frames so that they are ordered from greatest to smallest.
How many ways can you find?

Greatest



Smallest

There are various solutions. Children could even add to the first ten frame which give even more combinations.

Order Numbers

Notes and Guidance

Children order numbers from smallest to greatest or greatest to smallest. Children should use concrete and pictorial representations to prove or check their answers.

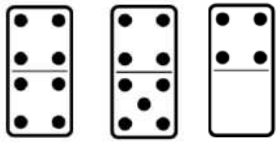
Children use the vocabulary 'smallest' and 'greatest' and may also use the < or > symbols to show the order of their numbers.

Mathematical Talk

Explain how you ordered the dominoes.
Can you use the inequality symbols to compare/order numbers?
How many answers are there? Can you prove it with cubes?
Which is/has the greatest? How do you know?
Which is/has the smallest? How do you know?
How are you going to order the amounts?
How have these objects/numbers been ordered? How do you know?

Varied Fluency

Order the dominoes from smallest to greatest.



Complete the sentences:

- The greatest number is _____
- _____ is the smallest number.

Order the number cards from smallest to greatest.

- _____ is the greatest number.
- _____ is the smallest number.
- _____ is greater than _____
- _____ is smaller than _____

Use < or > to make the statement correct.

Order Numbers

Reasoning and Problem Solving

Use 10 cubes.

Place them into 3 piles.

Order the piles from greatest to smallest.

How many different ways can you find?

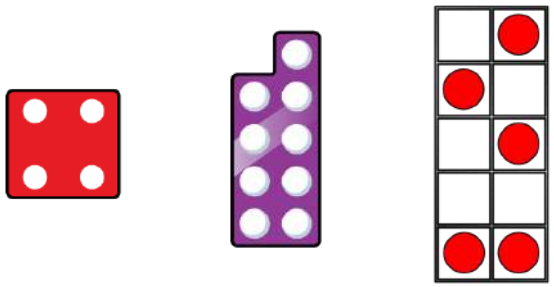
Possible answers:

7, 2, 1
6, 3, 1
5, 3, 2

Etc.

Jack says,

I have ordered the numbers from smallest to greatest.



Do you agree with Jack?
Explain your reasoning.

Jack is incorrect because his ten frame isn't full, it only had 5 in it so this should be in the middle.

Ordinal Numbers

Notes and Guidance

This is a non-statutory statement in the Year 1 curriculum. It has been included to see numbers as positional. It also links to previous lessons such as ordering numbers.

Stem sentences support children with using new mathematical language correctly.

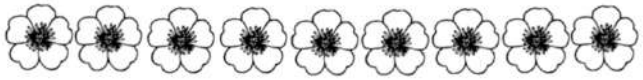
Mathematical Talk

When would I use 'last' place? Explain how you know.
How can you work out where _____ is?
When might we use ordinal numbers?
What does first mean?
Which is the first cube in the tower?
What does last mean?
Where is the last cube in the tower?
Is there always a first and last? Why?
Is there always a 4th? Why?

Varied Fluency

- Create a tower using different coloured cubes.
  Describe the order of the colours using 'first', 'second' 'third' and 'last' etc.
  Can you give your partner accurate instructions so that they can create the same tower?

- Colour the 7th flower blue. Start counting from the left.



Colour in another flower and complete the sentence.

The _____ flower is _____.

- Three children have a race.



Alex finishes first.
Amir finishes third.
What position does Whitney finish in?

Ordinal Numbers

Reasoning and Problem Solving

Two children have used the instructions to make a pattern.

> There are four shapes.
>
> The first is a circle.
>
> The last is a square.
>
> The other two shapes are a triangle and a rectangle.

Here are their patterns.

Amir ○ △ ▭ □

Dora ○ ▭ △ □

Who is correct?

They could both be correct because the instructions aren't clear, it doesn't state which order the middle two shapes need to be in.

Tommy, Teddy and Alex take part in a race.

The results are:

Teddy	Alex	Tommy
		
1st	2nd	3rd

Fill in the blanks:

Tommy finished behind _____.

Teddy finished in front of _____.

Alex finished in front of _____ but behind _____.

Tommy finished behind Teddy/Alex.

Teddy finished in front of Alex/Tommy.

Alex finished in front of Tommy but behind Teddy.

The Number Line

Notes and Guidance

Children will use a number line to practise and consolidate skills learnt so far. They should use the number line to:

- Count to 10
- See one more/one less
- See greater than/less than statements
- Order numbers

Using a number line gives children the opportunity to count from zero.

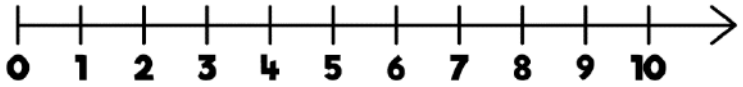
Mathematical Talk

Can you label the number line?
How do you know where to put the numbers?
How are numbers presented on a number line?
What does each mark on the number line represent?
Where does the number line start?
How did you choose where to put them?
Where does the number line end?
Do we have to start counting from 0 every time?
Which way will we 'jump' when we find one more/less?

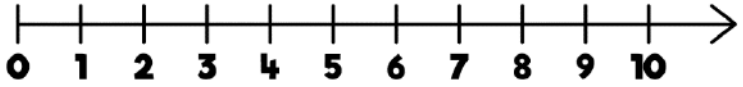
Varied Fluency

On the number line,

- Circle the number 7
- Underline a number **greater** than 7
- Draw an arrow to the number that is **one less** than 5
- Put a box around the **smallest** number.



How many jumps from zero is eight?



Is this more or less than the number of jumps to nine?

Write 5, 9 and 2 in the correct order on the number line.

The Number Line

Reasoning and Problem Solving

Game

Roll a die.

Place a counter on the number line covering the number shown by the die.

Work out how many jumps to 0 and how many to 10
Which is closer?

If you rolled a 6 and did three jumps, what numbers could you land on?

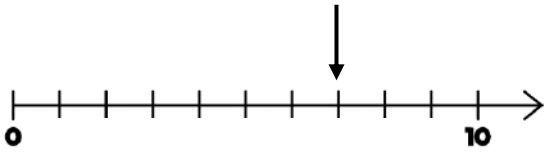
Can you roll a number where there are 7 and 3 jumps to 10 or 0?
Which numbers could they be?

Open ended. For example, if they roll a 4, they are 6 jumps from 10 and 4 from 0, so they are closer to 0

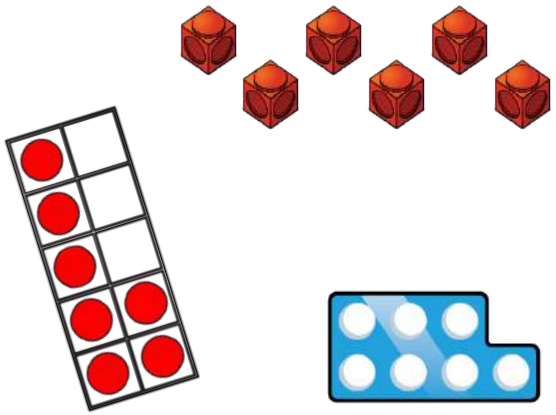
3 or 9 depending which way they jumped.

Children might work out this could be 3 or 7, but because there isn't a 7 on a dice it must be 3

Mo points to a number on the number line.



Which of these could **not** represent this number?



The cubes couldn't because there are only six of them and Mo has pointed to seven. The number piece and ten frame both show seven.

White Rose Maths

Autumn - Block 2

Addition & Subtraction

Overview

Small Steps

- Part-whole model
- Addition symbol
- Fact families – addition facts
- Find number bonds for numbers within 10
- Systematic methods for number bonds within 10
- Number bonds to 10
- Compare number bonds
- Addition – adding together
- Addition – adding more
- Finding a part
- Subtraction – taking away, how many left? Crossing out
- Subtraction – taking away, how many left? Introducing the subtraction symbol
- Subtraction – finding a part, breaking apart
- Fact families – the 8 facts
- Subtraction – counting back

Notes for 2020/21

The importance of early number and early understanding of mathematics cannot be underestimated. With the learning of reception children being disrupted, we've decided to put a bit more time early in Year 1 on numbers to 10, particularly around place value and the introduction to the concept of parts and wholes.

Number bonds are particularly important so ensure sufficient time is spent on these.

Overview

Small Steps

- Subtraction – finding the difference
- Comparing addition and subtraction statements $a + b > c$
- Comparing addition and subtraction statements $a + b > c + d$

Notes for 2020/21

The importance of early number and early understanding of mathematics cannot be underestimated. With the learning of reception children being disrupted, we've decided to put a bit more time early in Year 1 on numbers to 10, particularly around place value and the introduction to the concept of parts and wholes.

Number bonds are particularly important so ensure sufficient time is spent on these.

Part-whole Model

Notes and Guidance

Children need to understand that a number can be partitioned into two or more parts. This will help them with number bonds and addition.
They will be introduced to the part-whole model to show this concept clearly, and should get used to seeing it in different orientations.
Children should use and understand the language part, part, whole.

Mathematical Talk

What does whole mean?

What does part mean?

How can we represent the whole/parts?

Are the parts smaller or larger the more you partition them? Why?

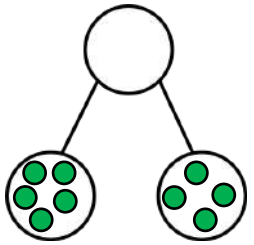
Can zero be a part?

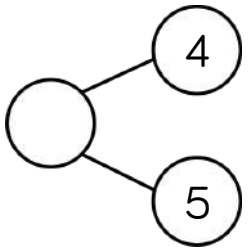
Can the parts be swapped around?

Can the whole be swapped with a part?

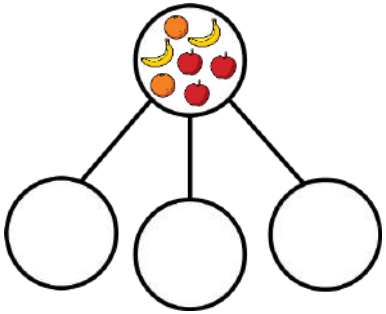
Varied Fluency

Complete the part-whole models by drawing counters and then writing the numerals.





Here are seven pieces of fruit.



Put the fruit into a part-whole model.
Complete the sentences.
_____ is the whole.
_____ is a part, _____ is a part and _____ is a part.

Draw the part-whole model that represents the stem sentences:

- A part is 4
- A part is 3
- The whole is 7

Part-whole Model

Reasoning and Problem Solving

There are 6 animals.  How many different ways can you sort the animals? Complete a part-whole model for each way. Can you partition the animals into more than 2 groups?	Various answers. E.g. brown & not brown 4 legs & 2 legs Multiple groups could be the type of animal. Part-whole models should accurately represent children's sorting.
4 is the whole. How many **different** part-whole models can you draw to show this? Use different numbers for the parts every time. Are any the same? Why?	4 and 0, 0 and 4 1 and 3, 3 and 1 2 and 2 Children should recognise 4 and 0 and 0 and 4 being the same etc.

Work in groups of up to 8 children. Can you split yourselves into different groups? Think of different ways to group yourselves: hair colour, eye colour, gender, shoe size etc. Complete a part-whole model for each way. Can you partition into more than 2 groups?	Children may split themselves into groups in many different ways. E.g. hair colour, month of birth, shoe size, gender etc. Part-whole models should accurately represent children's sorting.

The Addition Symbol

Notes and Guidance

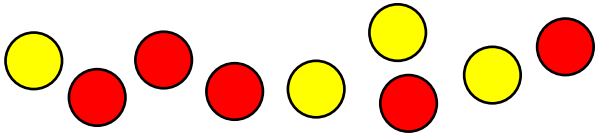
Children are introduced to the addition symbol (+) for the first time. They combine this with the 'equal to' symbol (=) to create their first number sentences e.g. $3 + 2 = 5$
At this stage, children focus on a specific order to the number sentence ($a + b = c$). They focus on the language associated with this number sentence. For example, 7 apples plus 3 apples is equal to 10 apples. First, then, now stories and bar models may help children understand the number sentences.

Mathematical Talk

How many were there at the start?
Then how many more were added?
What is the total?
What does the = mean?
Which number tells us how many we had to start?
Which number shows what has been added?
Which number represents the total?
How many green cubes could we use?
How many yellow cubes could we use?
Which part do the cubes represent?

Varied Fluency

Here are some counters.

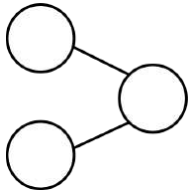


Group the counters by colour.
Fill in the gaps in the sentence and say it out loud.

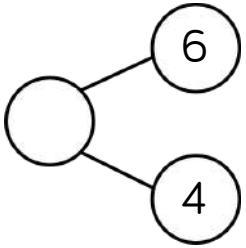
_____ red counters plus _____ yellow counters is equal to _____ counters.

Complete the part-whole model and the number sentence.

□ + □ = □



Use cubes to solve the following calculations.

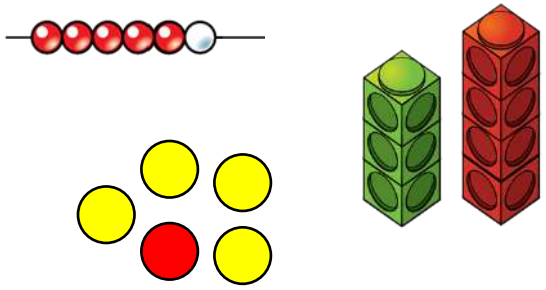


5 + 3 = □

8 + 1 = □

The Addition Symbol

Reasoning and Problem Solving



_____ + _____ = 6

Which of the images could help to complete the number sentence? Explain why.

Can you think of a number sentence for each of the other two images?

The bead string as there are 6 beads in total, 5 red and 1 white, so
5 + 1 = 6 or
1 + 5 = 6

The cubes could represent
3 + 4 = 7 or
4 + 3 = 7

The counters could represent
4 + 1 = 5 or
1 + 4 = 5

Using the numbers 0 – 9, how many ways can you fill in the boxes to make the calculation correct?
You can only use each number once.

□ + □ = □

How many different calculations are there?

What do you notice?

Examples may include:
5 + 1 = 6
3 + 4 = 7
There are 32 in total.

Children should recognise that the parts can be swapped to create a difference number sentence. There should be a discussion as to why we haven't/can't include 0 in our calculations.

Fact Families – Addition Facts

Notes and Guidance

Children build on initial number sentences by looking at addition fact families. They can see that the order of an addition sentence can be varied, and they begin to discover that addition is commutative.

E.g. $3 + 2 = 5$ $2 + 3 = 5$

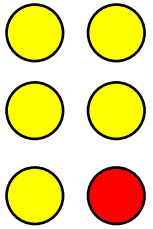
$5 = 3 + 2$ $5 = 2 + 3$

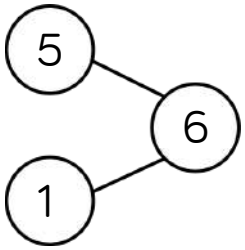
Mathematical Talk

Which number(s) represent a part?
Which number represents the whole?
Is the equals sign always at the end of a number sentence?
What's the same/different about the four addition sentences?
If two of the numbers in the part-whole model are the same, can we still write four addition sentences? Prove it.
Can we make another addition calculation using the same 3 numbers?
Can the parts change place? Can the whole change place? Why?

Varied Fluency

- Use the counters and the part-whole model to fill in the missing numbers.





$1 + \_\_ = 6$

$\_\_ + 1 = 6$

$\_\_ = \_\_ + 1$

$6 = \_\_ + \_\_$

- Complete the number sentences.

$\_\_ + \_\_ = 7$ $7 = \_\_ + \_\_$

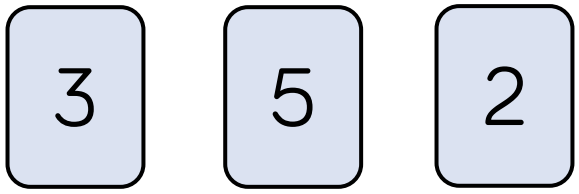
$\_\_ + \_\_ = 7$ $7 = \_\_ + \_\_$

- Use the number cards to make 4 addition sentences.

Fact Families – Addition Facts

Reasoning and Problem Solving

Eva has 3 number cards.



She has written two number sentences.

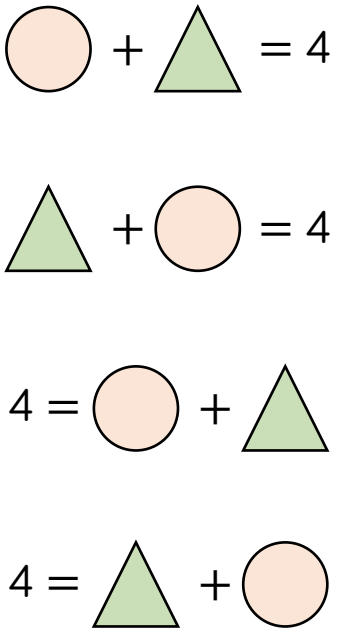
$3 + 5 = 2$ $3 = 5 + 2$

Explain what Eva has done wrong.

Correct her number sentences and complete the fact families.

Eva has placed the numbers in the order she was given them, rather than moving them to make the number sentence correct.

It should be:
$3 + 2 = 5$
$2 + 3 = 5$
$5 = 3 + 2$
$5 = 2 + 3$



What could the circle and the triangle be worth?

Possible answers:

Circle: 2
Triangle: 2

Circle: 3
Triangle: 1

Circle: 1
Triangle: 3

Circle: 0
Triangle: 4

Circle: 4
Triangle: 0

Number Bonds within 10

Notes and Guidance

Children combine their knowledge of the part-whole model and addition facts to explore number bonds within 10
Starting with the whole, children break numbers into parts and explore how many different ways a number can be partitioned.

E.g. $5 = 3 + 2$

$5 = 4 + 1$

Mathematical Talk

What is the whole?

What are the parts?

Does the whole always stay the same?

How can we partition the whole?

Do the parts stay the same or change?

If 8 is the whole, what could the parts be?

What number sentence would represent the parts we have partitioned the whole into?

Varied Fluency

- Here are 5 cubes.

Break them apart in different ways to find all the number bonds to 5
One has been done for you.

 $5 = 3 + 2$

- Use seven double sided counters. 

How many different ways to make 7 can you find?
Record your findings in number sentences.

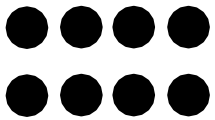
- If 9 is the whole, what could the parts be?

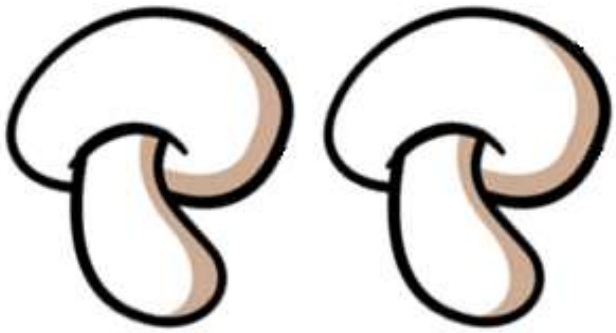
Show your findings in part-whole models.
Can you write an addition sentence for each part-whole model?

Number Bonds within 10

Reasoning and Problem Solving

All the dots have fallen off 2 toadstools.





How many different ways can you put them back on?

There are 9 different ways altogether.
8 and 0,
0 and 8,
7 and 1,
1 and 7,
6 and 2,
2 and 6,
5 and 3,
3 and 5
4 and 4

Always, Sometimes, Never

The greater the number, the more number bonds it has.

Sometimes.
Children can prove this by comparing the number bonds for a few numbers. For example, 6 has more bonds than 5, but 7 has an equal number of bonds to 5

Which number bond is the odd one out?

$3 + 4$ $5 + 2$ $6 + 1$ $3 + 5$

Explain your answer.

$3 + 5$ is the odd one out because this is a bond to 8 and the others are number bonds to 7

Systematic Number Bonds

Notes and Guidance

Children apply their partitioning skills to work systematically starting with the whole. E.g.

$7 + 0 = 7$
$6 + 1 = 7$
$5 + 2 = 7$
$4 + 3 = 7$

This is supported through the use of equipment, for example cubes, bead strings, double sided counters.

Mathematical Talk

What two numbers can be added together to make _____?

Write the number sentence to represent this number bond.

Are there any more ways to make this number bond?

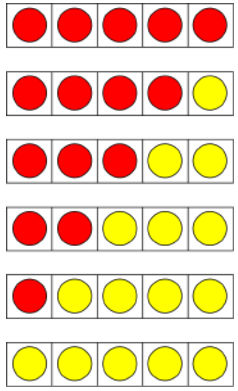
Can you see a pattern in the numbers?

What is happening to the parts each time?

Does the amount of number bonds change as the number gets bigger or smaller?

Varied Fluency

- Complete the number sentences.



$5 = 5 + 0$

$5 = 4 + 1$

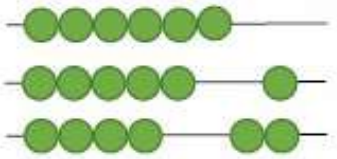
$\_ = \_ + \_$

$\_ = \_ + \_$

$\_ = \_ + \_$

$\_ = \_ + \_$

- Complete the next bead strings in the sequence.



$6 = 6 + 0$

$6 = 5 + 1$

$6 = 4 + 2$

- Can you use a ten frame to show all the number bonds to 7? Remember to be systematic.

Systematic Number Bonds

Reasoning and Problem Solving

Jack found the following number bonds to 8

3 + 5 0 + 8

1 + 7 4 + 4

2 + 6

What order would Jack have found them in if he'd have worked systematically?

There are 9 different ways altogether.
8 and 0
0 and 8
7 and 1
1 and 7
6 and 2
2 and 6
5 and 3
3 and 5
4 and 4

A butterfly's spots have fallen off.
How many different ways can you put the spots back on?

Remember to be systematic.

Possible answers:

0 + 7 = 7

1 + 6 = 7

2 + 5 = 7

3 + 4 = 7

Children may choose to use:
7 + 0 = 7
6 + 1 = 7
5 + 2 = 7
4 + 3 = 7

Number Bonds to 10

Notes and Guidance

Focusing on the number 10, children use a variety of representations to explore number bonds to 10 systematically e.g. ten frames, bead strings, fingers.

The children should also see the number sentence alongside the representation to help further develop their conceptual understanding.

Mathematical Talk

What number have you started with?

How many more do I need to make 10?

How many number bonds can I make if 10 is the whole?

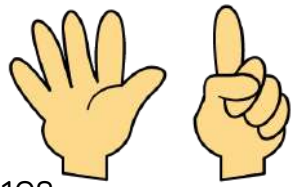
What would these bonds look like as a number sentence?

Can I order the number bonds systematically?

Do number bonds to 10 only contain one digit numbers?

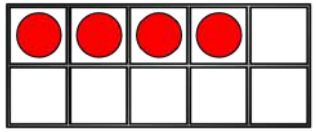
Varied Fluency

- Amir shows a number on his fingers.

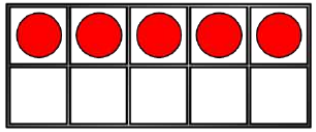


How many more fingers are needed to make 10?
What would this look like as a number sentence?

- Use the ten frames to complete the number bonds to 10



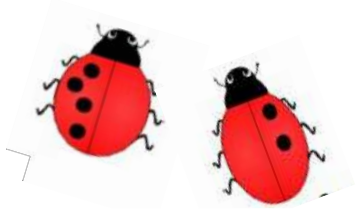
$4 + \_\_ = 10$



$5 + \_\_ = 10$

Can you make the ten frame that comes before in the sequence?
Can you make the ten frame that comes next in the sequence?

- All the ladybirds should have 10 spots. Some of the ladybirds have lost their spots. Complete the spots and write the number sentences.



Number Bonds to 10

Reasoning and Problem Solving

Always, Sometimes, Never

Number bonds to 10 have two different numbers added together.

Sometimes, there is one case where it is two of the same number.
$5 + 5 = 10$

Dora has 10 p to spend.

5 p 6 p 4 p

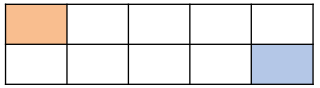
5 p 6 p 4 p

Which two items could she buy?
How many different ways can she do it?

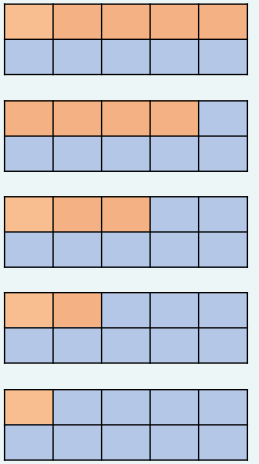
A chew bar and a muffin.
A banana and a chocolate bar.
A banana and a bottle of pop.
An apple and a chocolate bar.
An apple and a bottle of pop.

Tommy needs to colour in **all** of the boxes using two different colours.

One box of each colour has been done for him.



How many different ways can he colour the boxes?



This can also be the other way where there are 9 oranges and 1 blue, 8 oranges and 2 blues, 7 oranges and 3 blues, 6 oranges and 4 blues.

Compare Number Bonds

Notes and Guidance

Children use their knowledge of place value and number bonds to compare numbers and number sentences. They should use the correct language and symbols to compare.

E.g. 5 + 5 = 10 and 10 is greater than 8, so 5 + 5 > 8

Using concrete manipulatives will support their emerging knowledge of number bonds and can be used to develop a deeper understanding by proving why they know one number is greater than another.

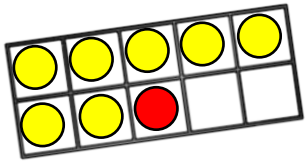
Mathematical Talk

What does compare mean?
Do we know what each side is worth?
How can we work out the total of each side?
Can you use equipment to prove that the number bonds are equal/unequal?
Do I have to solve both sides to see if the number bonds are equal?
Which calculation gives the largest answer?
Which calculation gives the smallest answer?
Which symbol can you use to show this?

Varied Fluency

- Match the number bonds that are equal.
  Can you use ten frames and counters to prove they are equal?

4 + 5	7 + 1
2 + 6	6 + 3
4 + 2	3 + 3



- Use cubes to help you fill in <, > or = to make the statements correct.

5 + 5 ◯ 10

5 + 5 ◯ 8

2 + 5 ◯ 5 + 3

- Complete the number sentences.

5 + 3 = 4 + ___

7 + 3 > ___ + 2

Compare Number Bonds

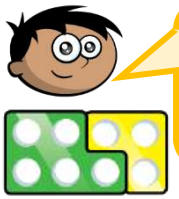
Reasoning and Problem Solving

How many different ways can you complete the number sentence?

$3 + \_\_ < 3 + \_\_$

Any combination where the number on the right is larger than the one on the left.

Amir and Whitney have both created their own number bonds.



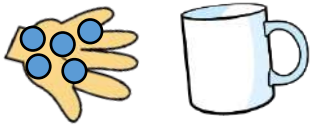
My total is greater because I have a 5 and a 3

My total is greater because I have 9 altogether.

Who do you agree with?
Explain your answer.

Whitney is correct because 9 ones is greater than 3 ones and 5 ones (8 ones).

Teddy has 5 counters in his hand and some in a cup.



Tommy has 3 counters in his hand and some in a cup.

They each have the same number of counters in total.

They each have less than 10 counters.

How many counters could be in Teddy's cup?

How many counters could be in Tommy's cup?

Possible answers:
Teddy could have 1 and Tommy could have 3
Teddy could have 2 and Tommy could have 4
Teddy could have 3 and Tommy could have 5
Teddy could have 4 and Tommy could have 6

Add Together

Notes and Guidance

Children will use a part-whole model to understand the concept of addition. They should be accurately using the '+' and '=' symbols.

Children should also become familiar with language related to addition such as 'total' and 'altogether'.

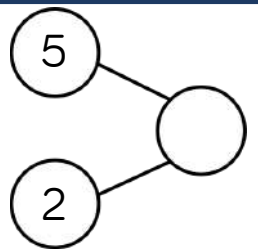
Mathematical Talk

What does each circle represent on a part-whole model?
Which of the numbers are parts?
Which of the numbers is the whole?
What else can we use to represent the cars? Can we only use counters and ten frames?
How many did you have to start with? Then what happened? How many do you have now?
How does the ten frame help us when finding the total? Did we need two ten frames for 5 and 4? Why?
What number sentence would represent this?

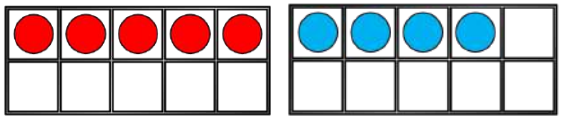
Varied Fluency

If 2 is a part and 5 is a part, what is the whole?

$\square + \square = \square$



There are 5 red cars and 4 blue cars. How many cars are there altogether?



$\square + \square = \square$

$\square = \square + \square$

Complete the table to represent the owls.

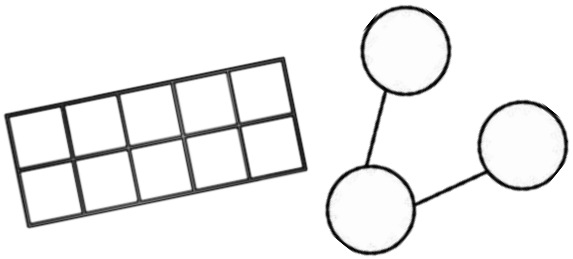
Ten Frame	Part Whole Model
Sentences	Make your own story
___ is a part. ___ is a part. The whole is ___ .	

Add Together

Reasoning and Problem Solving

There are 8 cubes.
Some are red and some are yellow.

How many different ways can you make a total of 8?



You should show your working out on a ten frame and a part-whole model.

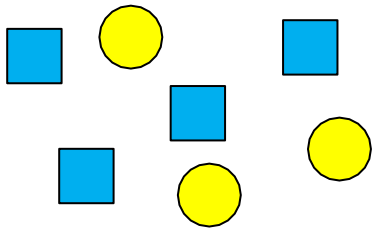
There could be:
7 red and 1 yellow,
6 red and 2 yellow,
5 red and 3 yellow,
4 red and 3 yellow,
3 red and 5 yellow,
2 red and 6 yellow
or 1 red and 7 yellow.

There are 9 sweets altogether.
3 have a red wrapper and 7 have a blue wrapper.
Is this correct?

Explain how you know.

Children could use cubes/ten frame to show that this is incorrect as 7 and 3 would make 10 not 9

Which sentence is correct?



A
5 is a part, 2 is a part and 7 is the whole.

B
4 is a part, 3 is a part and the whole is 8

C
4 is a part, 3 is a part and 7 is the whole.

What mistake has been made in the incorrect sentences?

A is wrong because the parts are not right.
B is wrong because the whole is not 8
C is correct.

Add More

Notes and Guidance

Children will move from counting all to counting on. It is important that they are exposed to calculations given to them in a different order, for example the smallest number first.
This will lead to children understanding that addition can be done in any order.
Continue to use concrete and pictorial representations to support the children's conceptual understanding.

Mathematical Talk

How many did you have to begin with?

How many more have been added?

How many do you have now?

What number sentence will represent this?

When using resources/images to find the answer, do I need to make/draw both numbers?

Do I have to start with the largest number?

Why is it more efficient to start with the larger number?

Varied Fluency

How many tractors are there in total?

6 + ___ = ___

There are ___ tractors.

There are 3 aeroplanes at the airport.
5 more aeroplanes land.
How many aeroplanes are there now?

Now there are ___ aeroplanes altogether.

How could we represent this as a number sentence?

There are four pennies in a bag and I add two more.
How many pennies do I have now?

□ = □ + □

There are ___ pennies.

Add More

Reasoning and Problem Solving

True or False?

If I add 0 to a number, the number stays the same.

Can you use a number line or counters to help you explain your answer?

True because when you add 0 you are not adding any more.

Mo has used the number track to complete 4 + 2
He thinks the total is 5

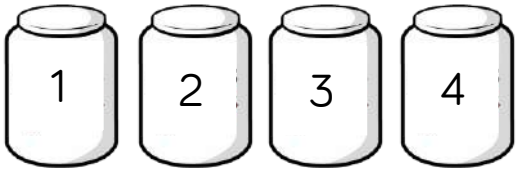
1	2	3	4	5	6	7	8

What mistake has he made?
How could Mo use the number track to find the correct answer?

He has included the starting number. To find the correct answer Mo could start counting from 5, or he could put the 4 on and then the 2 to show that the answer is 6

Sid has two bean bags.

He is throwing them into jars.
The number on the jar shows how many points he gets for a beanbag landing in that jar.
One of his beanbags lands in jar 2



What is the highest score he can get by throwing the second bean bag and adding the scores?

What is the lowest score he can get by throwing the second beanbag and adding the scores?

Explain why he can't get a total of 9

The highest score he can get is a 6 if his second beanbag landed in the 4 jar.
The lowest score he can get is a 2 if he misses the jars with his second beanbag.
He cannot get 9 because he got 2 with his first beanbag, so he would need 7 and there isn't a jar with 7 on.

Finding a Part

Notes and Guidance

Children should apply their understanding of number bonds to solve missing number problems. Building from counting on, children should start from the given part and count on to the whole, to find the missing part.

Children should also be exposed to problems with one part and the whole being the same so they understand the role of zero.

Mathematical Talk

Do you know the value of both parts?

Do you know the value of the whole?

How can we count on to find the missing part?

What number sentence would represent what we currently have/know?

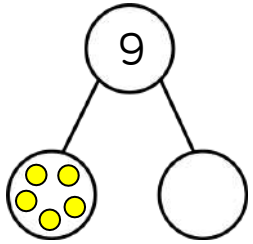
Where will the numbers from the word problem go in the part-whole model?

Where are we counting on from? How do you know?

Where are we counting to? How do you know?

Varied Fluency

- Complete the part-whole model and use it to fill in the number sentences.



□ + □ = □

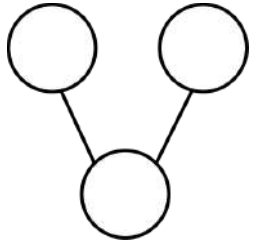
□ = □ + □

5 is a part, ___ is a part, 9 is the whole.

- There are seven cars in total. Seven of them are green. How many of them are yellow?

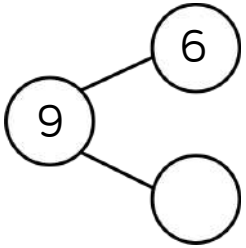
□ + □ = □

□ = □ + □



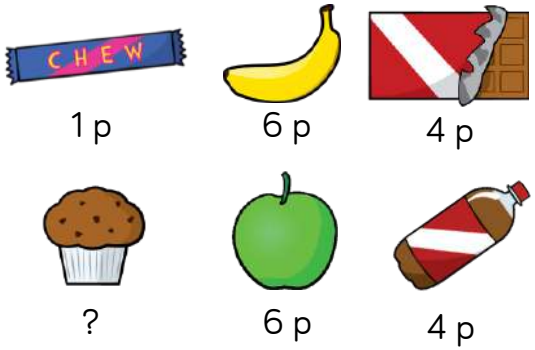
7 is a part, ___ is a part, 7 is the whole.

- Write your own story to complete the part-whole model.



Finding a Part

Reasoning and Problem Solving



Eva spends 10p on a chocolate bar and something else. What else could she have bought? Explain how you know.

Jack spent 9p on a banana and a muffin. How much is a muffin? Explain how you know.

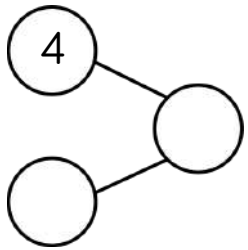
Rosie spent 6p on a chocolate bar and something for her brother. What did she buy for her brother? Explain how you know.

Eva could buy a banana or an apple as they are both 6 p and
4 p + 6 p = 10 p

A muffin costs 3 p because
6 p + 3 p = 9 p

Rosie bought her brother two chew bars because
4 p + 2 p = 6 p
and 1 chew bar is 1 p and nothing else is 2 p

Using the digits 0 – 9, how many ways can you complete the part-whole model? One of the parts always has to be 4



You can only use each digit once.

Explain why you can't use 0

What other digits can't you use and why?

It could be:

- 4, 1 and 5
- 4, 2 and 6
- 4, 3 and 7
- 4, 5 and 9

You can't use 0 because the whole would have to be 4 and then it would be repeated. You can't use 8 because if it was a part, the whole would be too big and if it was the whole we would need another 4

How Many Left? (1)

Notes and Guidance

Children are introduced to the language of subtraction rather than the subtraction symbol being explored straight away.

'Taking away' is used in a range of real life contexts such as flying away and eating.

The use of zero is important so children know that when nothing is taken away the whole remains the same.

First, then, now … story representations can help the children understand the concept of 'how many left'.

Mathematical Talk

How many objects were there to start with?

Do we need to count all the _____ or can we count on?

What could the story be? How many did we start with?

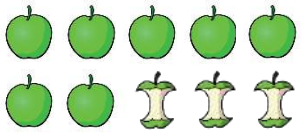
What number can we use to show that nothing has gone away/been taken away?

Varied Fluency

There were 7 birds in a tree and 3 flew away.
Complete the sentences.

At first there were ___ birds. Then ___ flew away. Now there are ___ birds in the tree.

Complete the sentences to create a story and draw a part-whole model.



At first there were ___ apples.
Then ___ were eaten.
Now there are ___ apples.

Write a story to go with the pictures and draw a part-whole model.

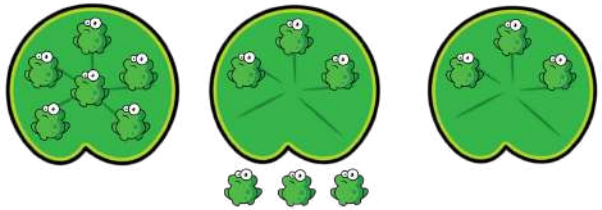
First: 

Now: 

How Many Left? (1)

Reasoning and Problem Solving

Some frogs are on a lily pad.
Three frogs jumped off and there are three frogs remaining.



Complete the sentences.

First there were ___ frogs. Then ___ frogs jumped off. Now there are ___ frogs on the lily pad.

In the 'then' picture, do the 3s show the same thing? Why not?

What if 4 jumped off, how many frogs would there have been at first?

Explain how you know.

At first there were 6 frogs.
Then 3 frogs jumped off. Now there are 3 frogs on the lily pad.

No, the 3 on the lily pad show how many are left. The 3 that are not on the lily pad show how many went away.

If 4 jumped off, the whole would have been 7 because 3 and 4 make 7

Some cakes have been eaten.

There are 2 cakes left.

How many cakes could there have been, and how many could have been eaten to be left with 2?

Explain your reasons.

There could have been 10 and 8 were eaten, 9 and 7 were eaten, 8 and 6 were eaten etc.
Children might use cubes/ten frames etc. to help them take away and finish with 2

How Many Left? (2)

Notes and Guidance

Once children understand the concept of taking away, the subtraction symbol can be introduced.

It is still important for children to create stories about the calculation and use concrete and pictorial representations so they can deepen their understanding of subtraction.

Mathematical Talk

How many counters were there at first? How many were taken away? How many are there now? Can you draw an image to show this?

What else could we use to represent the cars? How many will you start with? Why? How many will you take away? Why?

What is the same and what is different about the calculations?

Varied Fluency

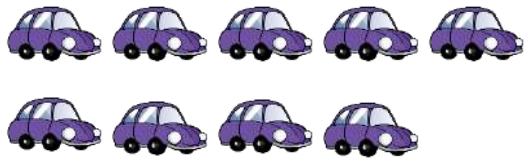
- Complete the number sentence.

7 – 2 = ___

Create a story to represent the calculation.

- Tom has 9 toy cars. He gives 5 of them away. How many does he have left?

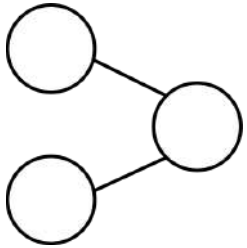
□ – □ = □



- At first there were 10 bananas. 7 of them were eaten. How many bananas are left?

Use counters/cubes to help you solve and complete:

□ – □ = □



How Many Left? (2)

Reasoning and Problem Solving

How many ways can you get an answer of 0?

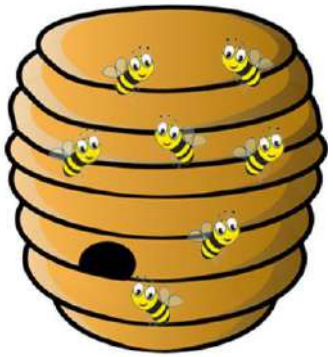
$\square - \square = 0$

What is the rule?

10 – 10, 9 – 9, 8 – 8 etc.

The rule is that to get zero, you have to take away the same number you started with.

How many calculations can you complete?



$\square = 7 - \square$

Why can't the digits 8 or 9 be used?

Children could write:
6 = 7 – 1
5 = 7 – 2 etc.

You can't use 8 or 9 because there are only 7 bees to begin with.

Subtraction – Breaking Apart

Notes and Guidance

Children continue using the subtraction symbol. Building on their understanding of finding a part, they are introduced to subtraction by partitioning.

Children break apart a number into two parts using concrete and pictorial representations to support.

Mathematical Talk

What is the whole? What are the parts?

If ___ is the whole, and ___ is a part, what is the other part?

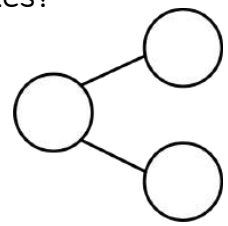
How can I use the array of party hats to convince someone else that my answer is right?

How many ways can I partition 8 into parts? Use two hoops and 8 counters to support.

Varied Fluency

- How many ice creams do not have flakes?

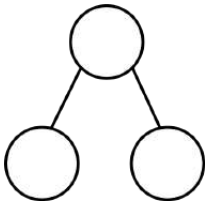
6 – 2 = ___



There are ___ ice creams that do not have flakes.

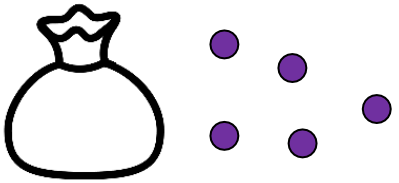
- There are 9 party hats altogether. 4 of them are red. The rest are blue. How many are blue?

___ = 9 – 4



There are ___ blue party hats.

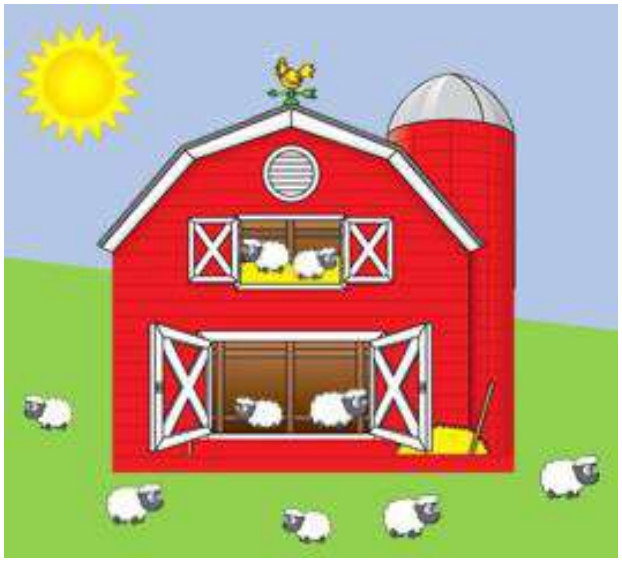
- In total there are 8 counters.
How many counters are there in the bag?
Show this in a part-whole model and as a calculation.



Subtraction – Breaking Apart

Reasoning and Problem Solving

Think of two questions to ask your friend about the image.



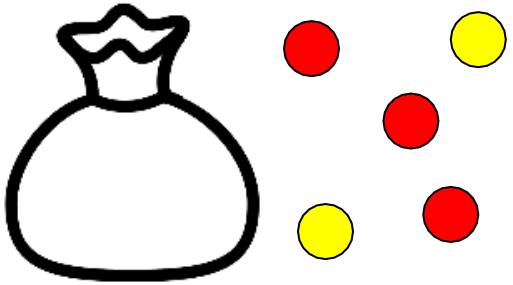
Represent your questions and answers in a part-whole model and as a number sentence.

Examples:
There are 9 sheep in total. 5 of them are outside the barn. How many sheep are inside the barn?

There are 9 sheep in total. 4 of them are inside the barn. How many sheep are outside the barn?

Etc.

There are no more than 10 counters in total.



How many counters could be in the bag?

Why can't it be six?

There could be 5, 4, 3, 2, 1 or 0

There can't be six because then there would be 11 counters in total, which is more than 10

Fact Families – 8 Facts

Notes and Guidance

Children will link addition and subtraction facts for the first time. It is important that children are able to show and understand this relationship. They should continue to be exposed to the use of zero.

Children can struggle with getting four calculations for subtraction e.g. $7 = 9 - 2$ and $2 = 9 - 7$ and should use concrete and pictorial representations to aid their understanding of this.

Mathematical Talk

How many counters were there at first? How many were taken away? How many are left? Can you draw an image to show this?

How many will you start with? Why?

How many will you take away? Why?

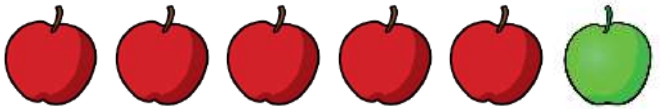
What is the same and what is different about the calculations?

Varied Fluency

- Using the image, how many calculations can you create?

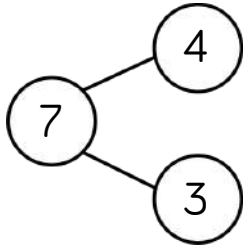
___ + ___ = ___	___ = ___ + ___
___ + ___ = ___	___ = ___ + ___
___ − ___ = ___	___ = ___ − ___
___ − ___ = ___	___ = ___ − ___

- There are 6 apples. 5 of them are red and 1 is green.



Write 8 number sentences to show this.

- Write 8 number sentences to match the part-whole model.



Fact Families – 8 Facts

Reasoning and Problem Solving

Explain the mistakes that have been made.

$5 + 2 = 7$ $\quad$ $7 = 5 + 2$

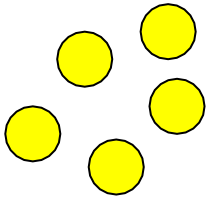
$2 + 5 = 7$ $\quad$ $7 = 2 + 5$

$7 - 2 = 5$ $\quad$ $7 = 5 - 2$

$7 - 5 = 2$ $\quad$ $7 = 2 - 5$

The bottom two on the right should be:
$5 = 7 - 2$
and
$2 = 7 - 5$

Amir has 5 counters in total.
Each of his counters are either in a bag or a cup.
How many different ways could the counters be split between the bag and the cup?



Write 8 number sentences to go with each.

Are any of the sets of number sentences the same? Why?

There could be:
5 in the cup, 0 in the bag
4 in the cup, 1 in the bag etc.

Children should notice that number sentences are the same for "4 in the cup, 1 in the bag" and "1 in the cup, 4 in the bag" etc. because the parts are the same.

Count Back

Notes and Guidance

Children count backwards to subtract. It is an important step to help children work in the abstract.

Common misconceptions could be that the children include their starting number when counting, e.g. 5 – 3; 5, 4, 3 – therefore giving the wrong answer.

It is vital to model how to count backwards by 'putting the start number in our head and counting backwards'.

Mathematical Talk

What number should we start on?

What number comes before 6?

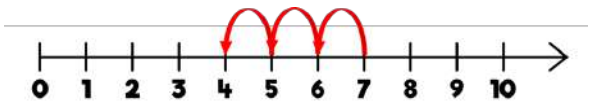
What could we say out loud to help?

Which calculations do you know match straight away?

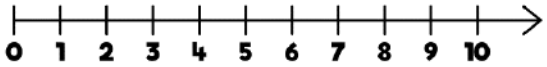
How do you know this?

Varied Fluency

Complete:

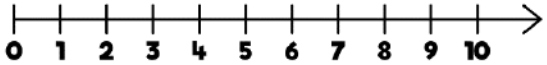


7 – 3 = ___



4 – 4 = ___

Use the number line to count back and match the calculations with the same answers.



7 – 3 = ___	6 – 6 = ___	10 – 6 = ___
5 – 0 = ___	9 – 4 = ___	4 – 4 = ___

Can you think of any other number sentences which could match them?

I count backwards from 9
How many steps does it take to get to two?
Show this in a number sentence.

Count Back

Reasoning and Problem Solving

Eva is calculating 7 – 2 and does this by counting backwards on a number line.

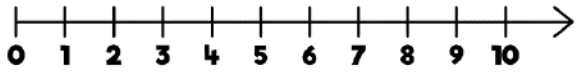
She gets an answer of 6

What mistake has she made?
What should the answer be?

Eva has included the starting number of 7 when she has been counting backwards.
The answer is 5

The answer is 2

How many ways can you get to this by counting backwards on this number line?



10 – 8,
9 – 7,
8 – 6 etc.

Game

Race to zero!

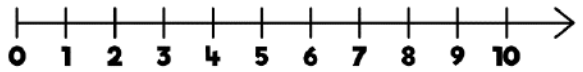
Start at 10 on a number line.

Roll a dice and subtract this amount.

The first person to land on 0 wins.

What would you like to roll? Why?

Why would you not want to roll a 1?



You might like to roll a 6 because it is a large amount to take away and so you would end up nearer to 0
You might not want to roll a 1 because it's a small amount and so it would take longer to get to 0

Find the Difference

Notes and Guidance

Children explore finding the difference as a form of subtraction. They often struggle with this concept because both parts are given.

Children could use their skills of counting back and counting on to help them find the difference. Alternatively, they can make both amounts and visually see how many more/less a number is.

Mathematical Talk

Who has more? How do you know? How many more does Whitney have?

What does difference mean? Which is most? How do you know? What strategy can we use to help us find the difference?

What image/resource can we use to show this?

How can we complete the sentences?

Varied Fluency

How many more cakes does Whitney have than Teddy?

Whitney 

Teddy 

Whitney has ___ more cakes than Teddy.

What's the difference between 10 and 6?

The difference between 10 and 6 is ___

10 – 6 = ___

Eva has 7 sweets and Mo has 3 sweets.
How many more sweets does Eva have?
How can you show this using cubes, counters or as an image?

Eva has ___ more sweets than Mo.

The difference between 7 and 3 is ___

7 – 3 = ___

Find the Difference

Reasoning and Problem Solving

Two numbers have a difference of 4

The larger number is less than 10

What could the two numbers be?

9 and 5
8 and 4
7 and 3
6 and 2
5 and 1
4 and 0

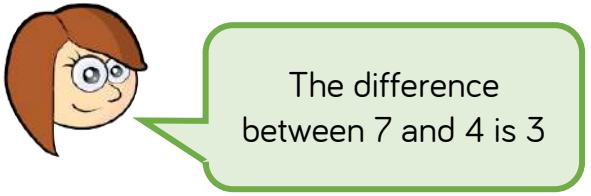
Annie says,

Write a number sentence to show why Annie is correct.

$10 - 3 = 7$
or
$7 = 10 - 3$

True or False?

Rosie says,



Can you show this in more than one way?

Children could show this by representing both numbers using cubes, bead strings, straws etc. or relating it back to counting backwards on a number line.

Compare Statements (1)

Notes and Guidance

Children use the inequality symbols to compare statements.

It is important that 'equal to' is also recapped at this stage with the correct language used.

Children should use concrete manipulatives and draw images to help them complete the statements.

Mathematical Talk

What does greater than mean?

How do we know that ___ + ___ is greater than ___?

What else can it be greater than?

What does less than mean?

How do we know that ___ + ___ is less than ___?

What else can it be less than?

What language is missing?

What steps do we need to take to help us complete the problem?

Varied Fluency

Complete the sentences.

3 + 1 is greater than ___

3 + 1 is greater than ___

3 + 1 is less than ___

3 + 1 is less than ___

One bird lays 3 eggs. Another bird lays 2 eggs.

Complete the sentence using greater than, less than or equal to.

2 plus 3 is _____ 6

Complete the number sentences.

___ + ___ is equal to 7

___ + 4 is less than 9

5 + ___ is _____ 2

Compare Statements (1)

Reasoning and Problem Solving

Would you rather have 6 sweets and 2 more sweets, or 8 sweets?

Explain your answer.
Use cubes or draw an image to help you.

I don't mind because I know that 6 and 2 is equal to 8

Using the numbers 0 – 10, how many different ways can you complete the boxes?

$\square + 7 = \square$

$\square + \square > 4$

$\square + \square < 9$

Possible answers:

$3 + 7 = 10$

$1 + 4 > 4$

$1 + 1 < 9$

What signs are missing?

$7 + 3 \bigcirc 10$

$9 \bigcirc 3 + 7$

$9 > 10 \bigcirc 3$

Explain how you know.

$7 + 3 = 10$ because I know that 7 and 3 is equal to 10

$9 < 3 + 7$ because I know that 9 is less than 10

$9 > 10 - 3$ because I know that 9 is greater than 7

Compare Statements (2)

Notes and Guidance

Once children are able to compare a simple statement to an integer (whole number), they should begin to directly compare two calculations.

They should be exposed to both addition and subtraction calculations, and the symbols <, > and =

It is important that children know what the 'equal to' sign means,

and that we can use it to show that two calculations are equal.

Mathematical Talk

What's the same? What's different?

Do we always need to solve each calculation before we compare?

Which symbol should be used?

How can we prove that they are equal?

Varied Fluency

Complete using <, > or =

__ + __ ○ __ + __

__ – __ ○ __ – __

Dora has 8 sweets and eats 4 of them.
Mo has 7 sweets and eats some of them.
They now have the same number of sweets.
Can you draw a picture to represent this?
Use your picture to help you complete the number sentences.

8 – 4 ○ 7 – __

8 – 4 is equal to 7 – __

Compare Statements (2)

Reasoning and Problem Solving

Tommy says,

5 + 2 is greater than 4 + 4 because 5 is greater than 4

Is he correct? Explain why.

No because

5 + 2 = 7

4 + 4 = 8

and

7 < 8

Use the digit cards to complete the sentences.

2	3	4	5

__ + __ = __ + __

__ − __ = __ − __

__ − __ > __ − __

__ − __ > __ + __

Can you write any more number sentences using these cards?

Possible answers:

5 + 2 = 4 + 3

5 − 4 = 3 − 2

5 − 2 > 4 − 3

5 − 2 < 4 + 3

Etc.

White Rose Maths

Autumn - Block 3

Shape

Overview

Small Steps

- Recognise and name 3-D shapes
- Sort 3-D shapes
- Recognise and name 2-D shapes
- Sort 2-D shapes
- Patterns with 3-D and 2-D shapes

Notes for 2020/21

This should be brand new content for Year 1.

Try to make this block as practical as possible and use outdoor space to explore shapes in nature.

3-D Shapes

Notes and Guidance

Children name simple three dimensional shapes: cuboids (including cubes), cylinders, pyramids, cones and spheres. Ensure children see the shapes in a variety of orientations so they develop a deeper understanding of the shape.

Children start to consider the 2-D shapes they can see on the faces of the 3-D shapes which will support them when looking at 2-D shapes later in the block.

Mathematical Talk

What makes a shape 3-D?

Can we see any 3-D shapes in the classroom?

Can you name this 3-D shape?

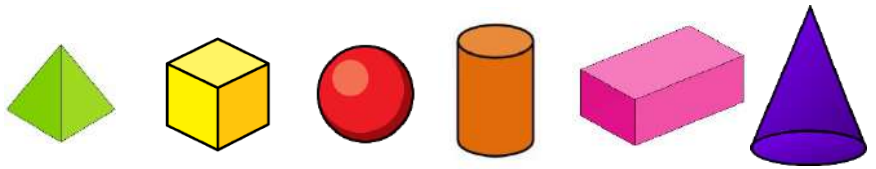
Do cubes all look the same?

Does the shape change when we turn it around?

Can you think of any everyday objects that are cones? Can you think of any everyday objects that are cubes? Can you think of any everyday objects that are ...

Varied Fluency

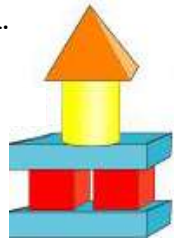
Match the shape to its name.



cube | cylinder | cuboid | pyramid | cone | sphere

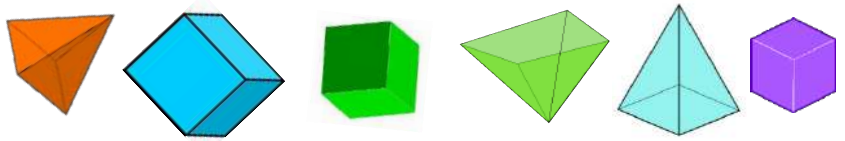
Complete the sentences to describe the model.

There are _____ cuboids.
There are _____ cylinders.
There are _____ pyramids.
There are _____ cubes.



Build your own model using 3-D shapes and ask a partner to describe it.

Circle the cubes. Tick the pyramids.



3-D Shapes

Reasoning and Problem Solving

Put a selection of 3-D shapes in a feely bag.
Choose a shape. What do you think it is?

Explain how you know.

Possible answer:

I think it is a cuboid because I cannot feel any curved surfaces but I can feel a long and smaller face.

Use 3-D shapes to build a tower.

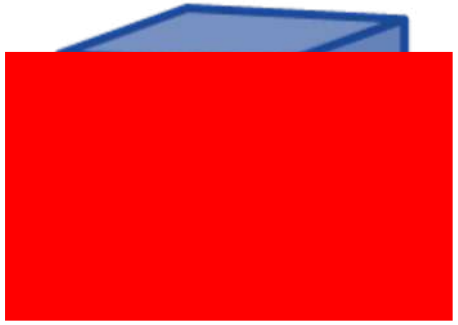
Which shapes are the best for the bottom of the tower?

Which shapes can only go on the top of the tower?

Can you use any of the shapes only in one orientation?

Children may reason about different shapes depending on if the shapes have flat or curved surfaces.

The bottom of a 3-D shape is hidden.



What shape could it be?

Explain how you know.

Possible answers:

Cube
Cuboid
Pyramid

Sort 3-D Shapes

Notes and Guidance

Children sort and group 3-D shapes according to simple properties, including type, size, colour.
They also consider sorting shapes based on whether they roll or stack. This will lead children to think about why a shape rolls (curved face) or why it will stack (flat face).
Children should recognise that the orientation of a shape does not affect its properties.

Mathematical Talk

Why is the shape the odd one out?

What is the same about the shapes? What is different?

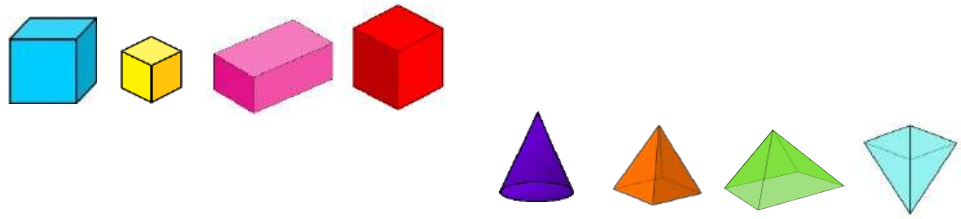
Can you find an everyday object to add to each of the groups?

How can you test if the shapes roll? What do the shapes that roll have in common?

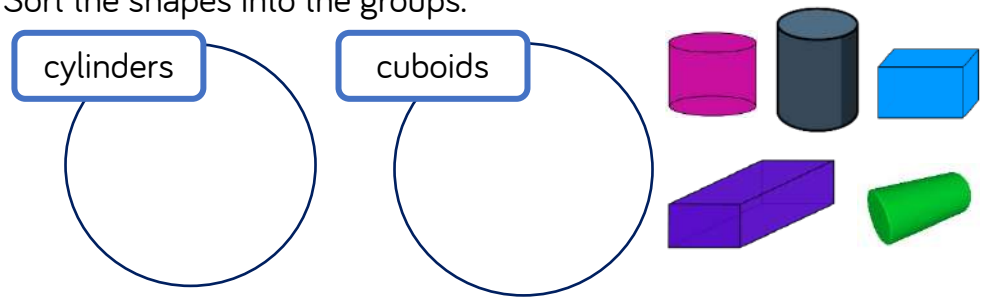
How can you test if the shapes stack? What do the shapes that stack have in common?

Varied Fluency

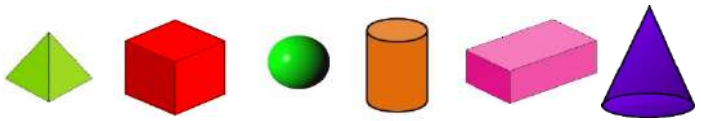
Circle the odd one out in each group.



Sort the shapes into the groups.



Which shapes will roll? Circle them.
Which shapes with stack? Tick them.

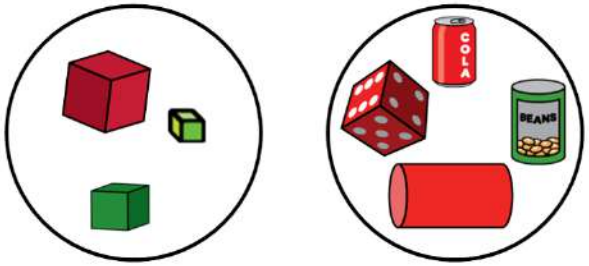


Will any of the shapes roll and stack?

Sort 3-D Shapes

Reasoning and Problem Solving

Some 3-D shapes have been sorted.



Have the shapes been sorted correctly?

Explain how you know.

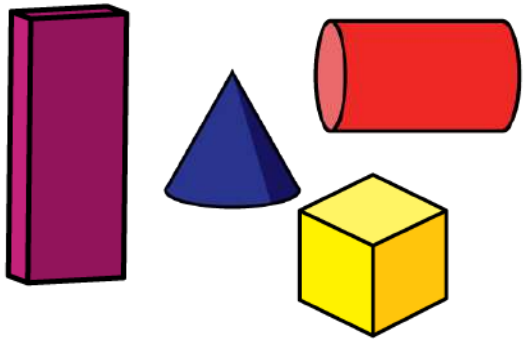
How else could the shapes be sorted?

Possible answers

The shapes have been sorted into cylinders and cubes. The dice needs to be moved.

The shapes have been sorted into colour. The green tin of beans and the red cube need to be moved.

How many ways can you sort the shapes into groups?



Possible answers:

Straight faces and curved surfaces.

Shapes with a circular face and shapes with a square face.

Big shapes and small shapes.

2-D Shapes

Notes and Guidance

Children see 2-D shapes on the surfaces of 3-D shapes.

Children can use the 3-D shapes as stencils or prints to make 2-D shapes. It is important that children see 2-D shapes are flat.

Looking at 2-D shapes, children name triangles, squares, rectangles and circles.

Mathematical Talk

What is the name of this 3-D shape?

What can you tell me about the surfaces?

What are the names of the shapes on the surfaces?

How many _____ are on the surface of this shape?

Is there more than one type of shape on the surfaces?

Where else can we see 2-D shapes around the classroom?

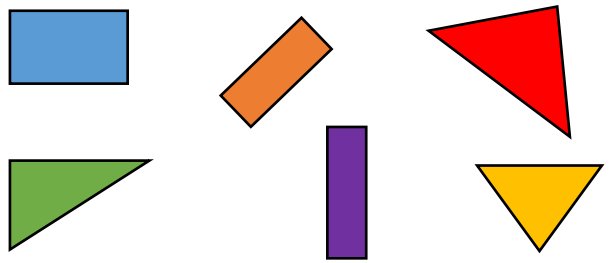
Varied Fluency

- Choose a 3-D object. Use one of the faces as a stencil to draw around. Name the shape that you have drawn.
  How many different 2-D shapes can you draw using 3-D shapes as a stencil?

- Match the 2-D shapes to their names.

Rectangle Circle Square Triangle

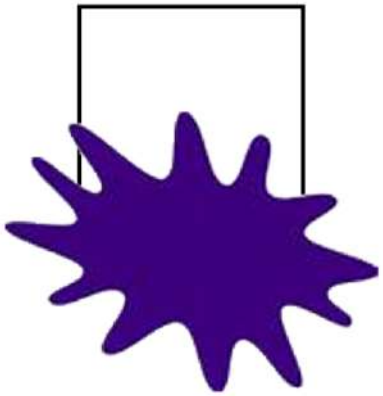
- Circle the triangles, tick the rectangles and draw a circle and a square.



2-D Shapes

Reasoning and Problem Solving

Part of a shape is hidden.



What shape could it be?

Is there more than one possibility?

Explain your thinking.

It could be a square because it can have 4 sides the same length.

It could be a rectangle because it could have 2 longer sides.

Here is part of a shape.

How many different ways can you complete the shape using one or more straight lines?

Compare your shape with a partner.

What is the same and what is different?

Children could continue the shape to make a square, rectangle or triangle.

Sort 2-D Shapes

Notes and Guidance

Children sort and group 2-D shapes according to simple properties, including type, size, colour. Children should recognise that the orientation of a shape does not affect its properties.
Children consider what is the same and what is different about the shapes. Teachers highlight the similarities between squares and rectangles, however, it is not vital that children understand that a square is a type of rectangle at this stage.

Mathematical Talk

What is the name of this shape?

Can you describe the shape?

Compare your shape to a different shape – what is the same and what is different?

Compare your shape to other shapes with the same name – what is the same and what is different?

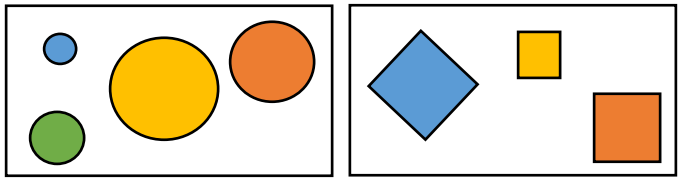
How have the shapes been sorted?

Could the shapes have been sorted in a different way?

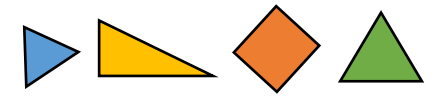
Varied Fluency

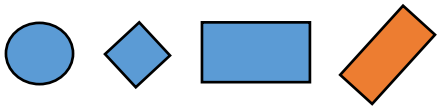
- Go on a shape hunt around the school.
  Take photos of 2-D shapes then sort them by their name.
  Can you sort them any other way?

- How are the shapes grouped? Label each group.



- Circle the odd one out in each group.

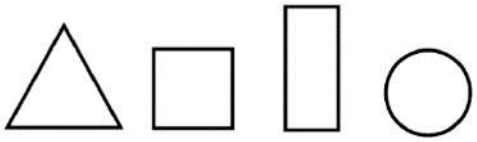




Sort 2-D Shapes

Reasoning and Problem Solving

Use a selection of triangles, rectangles, squares and circles.



Put your shapes into groups.

Ask a partner to label your groups.

How many different groups can you create?

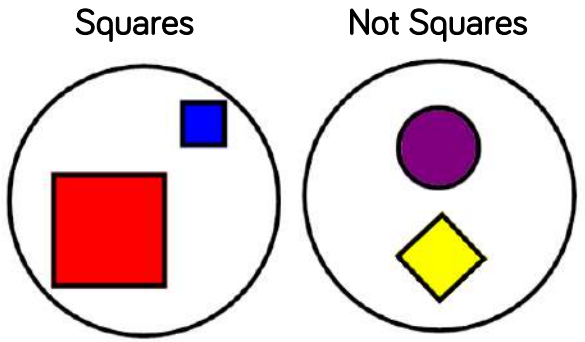
Possible ways of sorting:
Colour, name of shape, number of sides etc.

Tommy says that all shapes with 4 sides are squares.

Is Tommy correct?
Prove it.

Tommy is incorrect as there are many other 4-sided shapes including rectangles.

Eva has sorted some shapes.



Has she sorted them correctly?
Explain how you know.

She has not sorted them correctly. The yellow shape is a square in a different orientation.

Patterns with 3-D & 2-D Shapes

Notes and Guidance

Children use 2-D and 3-D shapes to complete and make simple patterns focusing on different shapes, sizes and colours. Encourage children to say the patterns aloud, consolidating shape names. Use shapes in different orientations to reinforce children's recognition of 2-D and 3-D shapes. Children recognise the core of each pattern (which part is being repeated) and use this to continue patterns in any direction as well as around a circle.

Mathematical Talk

What is the order of the shapes in the pattern?

How can we describe the pattern?

What is the same and what is different about the patterns?

What will the next shape be?

What is the core of the pattern?

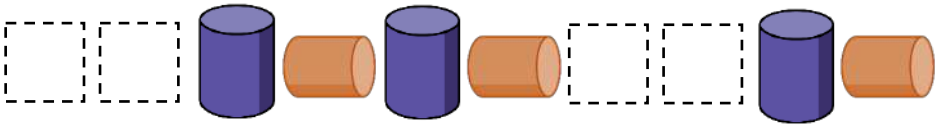
How many shapes (elements) are in each repeat?

Varied Fluency

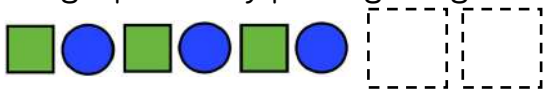
Annie is making a pattern.

Can you say the pattern aloud? Rectangle, triangle, circle, rectangle, triangle, circle …
Which shape comes after the circle?
Which shape comes before the rectangle?

Name the missing shapes in each pattern.



Jack is making a pattern by printing using 3-D shapes.



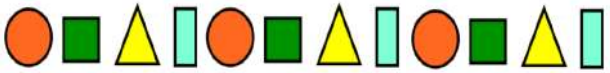
Which 3-D shapes could Jack use to continue the pattern?
Can you make your own printed pattern using 3-D shapes?

Patterns with 3-D & 2-D Shapes

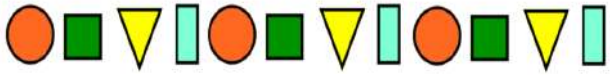
Reasoning and Problem Solving

Amir and Eva are making patterns.

Eva



Amir



Eva

Our patterns are exactly the same.

Our patterns are different.

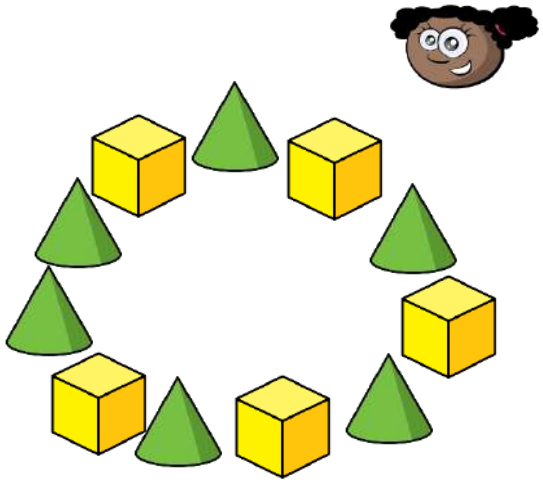
Amir

Who do you agree with?

Explain your answer.

Amir is correct because the triangle is in a different orientation.

Whitney is making a pattern in a circle.



Is Whitney's pattern correct?
Explain why.

Can you make your own circular pattern using 3-D shapes?

Whitney's pattern is incorrect. She has 2 cones together. She needs to make the circle a little bigger or smaller so the pattern continues all the way around the circle.

White Rose Maths

Autumn - Block 4

Place Value

Overview

Small Steps

- Count forwards and backwards and write numbers to 20 in numerals and words
- Numbers from 11 to 20
- Tens and ones
- Count one more and one less
- Compare groups of objects
- Compare numbers
- Order groups of objects
- Order numbers

Notes for 2020/21

Only move onto numbers to 20 at this stage if children are secure and confident with numbers to 10.

An extra week is given at the start of the Spring term to consolidate this learning.

Count & Write Numbers to 20

Notes and Guidance

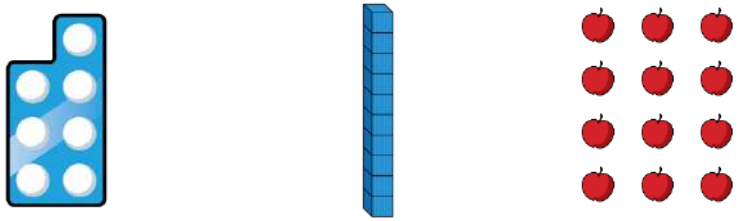
Children are building on their existing knowledge of counting forwards and backwards by introducing the numbers 11-20
Children should explore the meaning of the suffix 'teen' and what this tells us about a number.
11, 12, 13 and 15 are usually difficult for children to understand because they cannot hear the single digit in the name like others e.g. sixteen – six ones and a ten.

Mathematical Talk

Let's count together from 9, 10, 11, 12, 13, 14, 15, 16
What do you notice about the sounds of the numbers?
Do you notice a pattern with the numbers?
What comes after the number 10?
What do you notice about the ends of most of these numbers?
What does 'teen' tell us about a number?
How do we say this number?
How would we write _____?

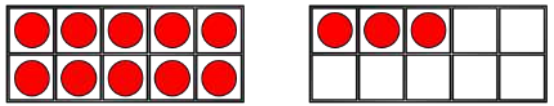
Varied Fluency

- Match the representations to the correct numeral.



12 7 10

- Write the number shown on the ten frames in numerals and words.



Use your own ten frames to show me the number:
Fourteen 18 Nine 16

- Fill in the missing numbers.

	15		17		
16					11

Count & Write Numbers to 20

Reasoning and Problem Solving

Circle the odd one out and explain why.

11	12	13	14
15	61	17	18

61 is the odd one out. It should be 16, the digits have been swapped round.

Mr Monaghan says,

Will Mr Monaghan say 11?

Explain how you know.

Yes because 11 is between 8 and 20

Numbers from 11 to 20

Notes and Guidance

Children use concrete and pictorial representations to explore the different ways to represent a number.

Base 10 is formally introduced in the next step, but if children are familiar with this model then they can use it.

Children should be encouraged to use multiple representations.

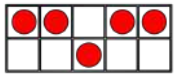
Mathematical Talk

How many _____ will you need to make _____?
How will you know if you've got enough?
What's the same and what's different about these representations?
How do we write the number _____?
What will the number _____ look like in _____?
What number has been made using the equipment?
How did you find out?
Do we have to count from 1 every time?

Varied Fluency

- Draw a picture to show me 13
  Compare yours with a partner.
  What's the same? What's different?

- Complete the table.

Numeral	Representation
17	
	
13	
	

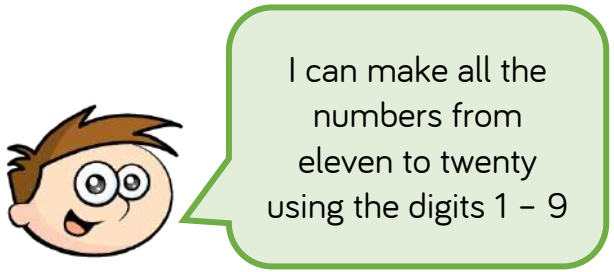
- Using two ten frames, show me a number:

  More than 12 Less than 20 Equal to 10 + 10

Numbers from 11 to 20

Reasoning and Problem Solving

Teddy says,



Do you agree?
Explain your answer.

Teddy is wrong because you need a zero to make twenty (20).

Game

Use two sets of number cards.

1 set with numerals 1 – 20

1 set with words 1 – 20

Play in groups of 3 or 4

Take it in turns to pick a numeral card and a word card. Say the number on each card out loud. If they match you win the pair, if they don't you put them back.

Tens and Ones

Notes and Guidance

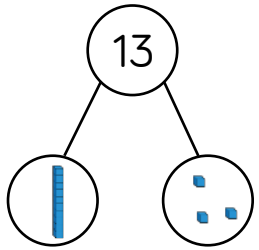
Children learn each number from 11 to 19 has '1 ten and some more'.
They will see 10 and 20 as having just tens and no ones.
Children still need to understand that numbers can be seen in different ways. Discuss 1 ten being equal to 10 ones.
Base 10 will be introduced in this step. Children can use these concretely but also draw them as 'sticks and bricks'. A line represents 1 ten and a dot represents 1 one.

Mathematical Talk

What numbers come after 10?
Which numbers have the 'teen' sound in them?
What does the number _____ look like?
Which is greater 1 ten or 1 one? How do you know?
What does 'teen' tell us about a number?
Can you swap tens for ones?
Will it change the amount? Explain.
Do we need to count the 10 individually?
Do we need to start counting from 0 every time?
Can you describe the number _____ using tens and ones?

Varied Fluency

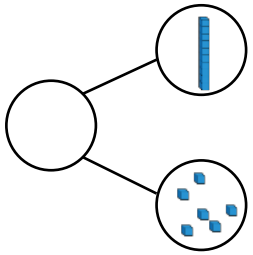
Use the part-whole model to complete the sentences.



My number is _____

One part is _____, the other part is _____

The whole is _____

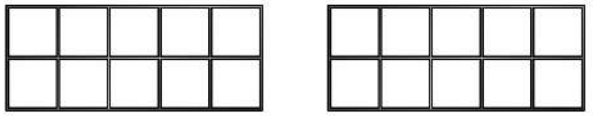


My number is _____

It has _____ tens and _____ ones.

The whole is _____

Fill in the ten frames with counters to show 14 and complete the sentence.

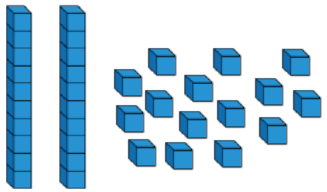


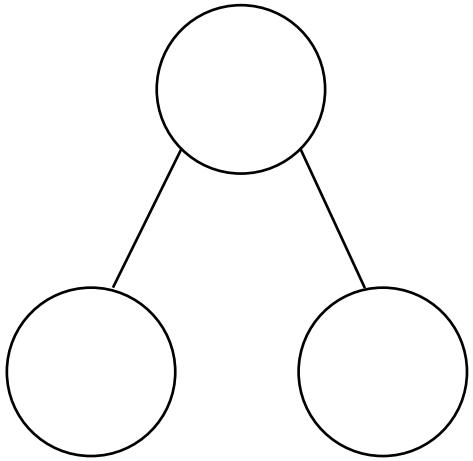
14 has _____ ten and _____ ones.

Tens and Ones

Reasoning and Problem Solving

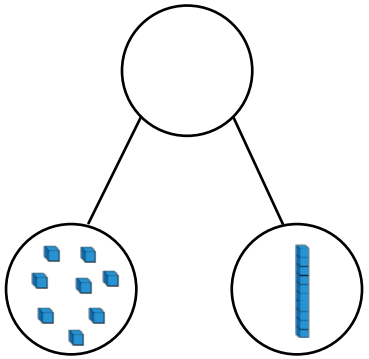
How many ways can you complete the part-whole model to show numbers up to 20, using the Base 10 equipment – you do not have to use it all.





Open ended e.g. 1 ten and 5 ones make 15

Alex makes a part-whole model.



She says:

Explain her mistake.

What is her number?

Alex has counted the ones as tens and the tens as ones.

She should say there is 1 ten and 8 ones.

Her number is 18

Count One More and One Less

Notes and Guidance

Children will apply their counting skills to find one more and one less. Children have already been exposed to the language of more and less and used resources such as number lines and number tracks.

Children need to understand that one more, is one more 1 and not one more 10

To address this misconception, this should be clearly modelled using concrete resources.

Mathematical Talk

How can you represent the number _____?

How could we find one more?

How does this change the number?

Which digit changes?

How would we find one less?

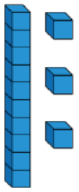
How does this change the number?

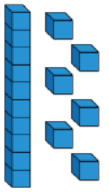
What's the same and what's different between 12 and 13?

Is it only ever the ones digit that changes?

Varied Fluency

Make one more and one less than these numbers.





Draw to complete.

One less		One more
	13	

Draw to complete.

One less		One more
		

Count One More and One Less

Reasoning and Problem Solving

Mo says,

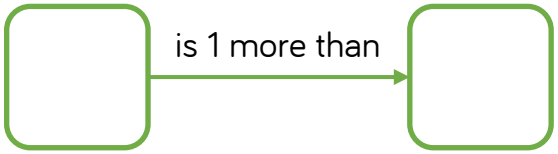
I am one year older than my sister.
My sister is one year older than my brother.
My brother is 13

How old is Mo?
How old is his sister?

Mo is 15
Mo's brother is 13
So Mo's sister must be 14 –as she is one year older than Mo's brother. Mo must be 15 as he is one year older than his sister.

Use number cards 11 – 20

How many different ways can you complete the boxes?



Example answers:
18 is 1 more than 17
12 is 1 more than 11

Teddy thinks of a number.

1 more than his number is 11

What is his number?
Prove it.

Teddy's number is 10

Rosie thinks of a number.

1 less than her number is 15

What is her number?
Prove it.

Rosie's number is 16

Compare Groups of Objects

Notes and Guidance

Once children are confident making and exploring numbers greater than 10, they can begin to build on this by comparing groups of numbers.

They continue to use vocabulary of comparison such as: greater than, less than and equal to.

Children have explored finding the difference and they can use this as a strategy to find out how many more.

Mathematical Talk

Can you see which group is greater without counting them?
How do you know?
How many in each group?
Which group has the most?
Which group has the least?
How do you know?
How many more does group _____ have than group _____?
Could you use the inequality symbols to compare the numbers?

Varied Fluency

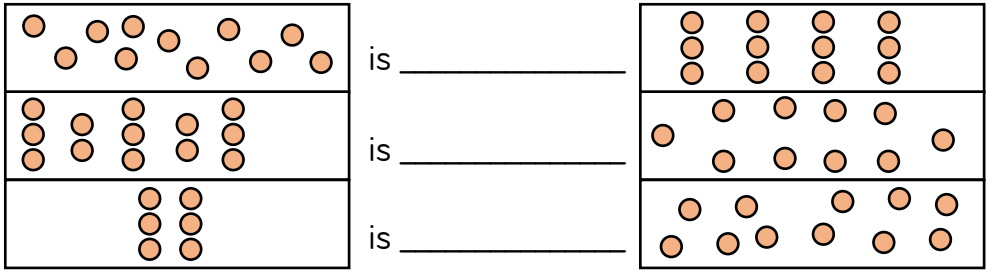
- Which is greater?

A 

B 

By how many?

- Use '**less than**', '**greater than**', or '**equal to**' to complete the sentences.

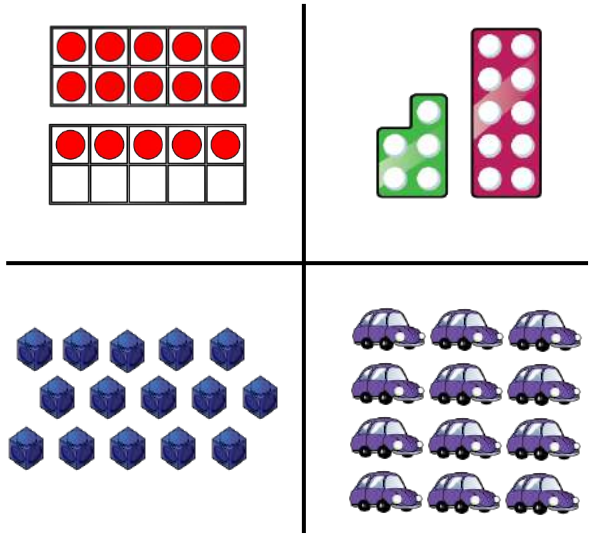


- In pairs, both make a number on a bead string (only use up to 20 beads). Compare bead strings in a sentence and using the inequality symbols.

Compare Groups of Objects

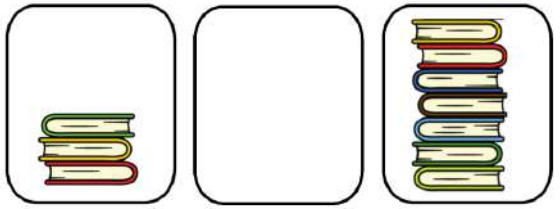
Reasoning and Problem Solving

Which image is the odd one out?
Why?



The cars because there are 12 and the rest are representations of 15

How many books can go in the empty box?



Compare with your partners- have you drawn the same amount of books?

How many possibilities are there?

Is it possible to have 3 or 7 books in the middle pile?

The middle box could have 4, 5 or 6 books.

Compare Numbers

Notes and Guidance

Children build on comparing numbers to 10 by comparing numbers up to 20
In this step, children will be given abstract numbers written in digits and need to be encouraged to use previous learning to choose an efficient method to compare numbers.
Make sure children are also continuing to compare numbers below 10 as well as 10 and above.

Mathematical Talk

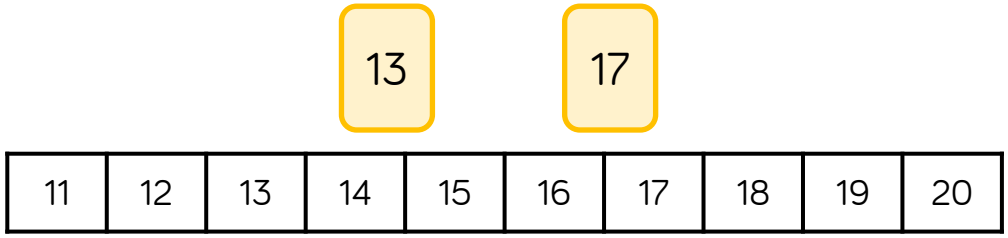
What happens to the sign when you swap the numbers around?
What does compare mean?
What language will you use when comparing?
Will zero always be the smallest number when comparing?
What numbers are you comparing?
Which number is the largest/greatest? How do you know?
Which number is the smallest? How do you know?
Which symbol can you use in your statement?

Varied Fluency

Circle the greatest number.

- Twelve Twenty
- 8 17

Here are two number cards. Use a number track to explain which one is smaller, and by how many.



Complete the statements.

14 ◯ 9
19 ◯ 20
13 < ____

Compare Numbers

Reasoning and Problem Solving

Dora has three jars of sweets.

A = 12 B = ___ C = 17

She says:

A has the least sweets.
C has the most sweets.

How many sweets could be in B?

Possible answers:
13, 14, 15, 16

Discussion point with class:
can it be 12 or 17?

It cannot because it would have to be phrased 'A and B have the least/most'.

Fill the gaps:

_____ is more than 15 but less than 20

_____ is less than eighteen but more than twelve.

What numbers could go in the gaps?

Explain your answer.

Possible answers:

16, 17, 18, 19

13, 14, 15, 16, 17

Order Groups of Objects

Notes and Guidance

Children build on ordering groups up to 10 by applying the same skills to numbers up to 20
It is important for children to recap ordering numbers below 10
Children will now order three groups of objects in this step to support them in ordering 3 abstract numbers in the following step.
It is important to share different methods so children are continually exposed to more efficient ways.

Mathematical Talk

How can you order the groups?
How can you work out which is the largest/smallest?
Can you just look at two groups first? Why?
What is happening to the numbers when we order from largest to smallest?
Can you think of an amount less than the smallest group?
How is your drawing different to your partners?
Can you describe the order using largest and smallest?
What would happen to your description if we changed the numbers around?

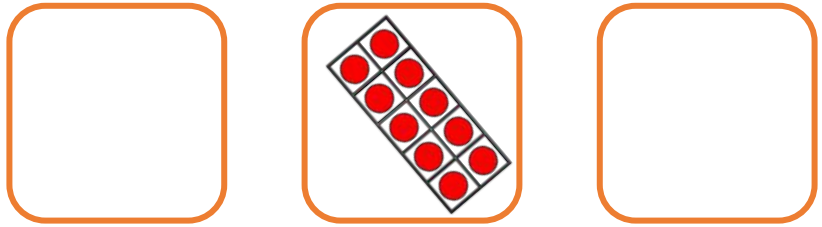
Varied Fluency

- Order the numbers of crayons from smallest to greatest.

- Use cubes to make these numbers and then order them from greatest to smallest.

19 3 14

- Draw counters in each box to make the increasing pattern correct.

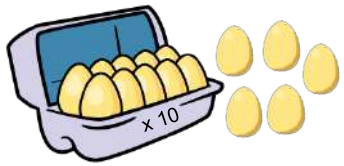


Order Groups of Objects

Reasoning and Problem Solving

All of the eggs are placed into baskets.

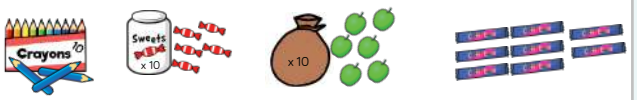
How many different ways can you make it correct?



Greatest Least

Various answers.
E.g.
8, 5, 2
9, 4, 1 etc.

Alex orders the groups of objects from smallest to greatest.



Teddy says,

This is the incorrect order because there are more apples than chew bars.

Do you agree with Teddy?

Has Alex done anything else wrong?

I agree with Teddy, there are more apples than chew bars. There are also more sweets and crayons than chew bars.

The order should be:

chew bars, crayons, sweets, apples.

Order Numbers

Notes and Guidance

Children now order abstract digits from 0 to 20
They can choose to represent these with concrete materials or draw them pictorially to help them order.

Children need to apply their knowledge of tens and ones to help them work within the abstract. For example, when comparing 8 and 15 only the number 15 has a ten, therefore it must be greater.

Mathematical Talk

How have you been asked to order the numbers?
Which is the greatest? How do you know?
Which is the smallest? How do you know?
Is it easier to order groups of objects or numbers? Why?
If you have numbers, can you still use objects? Does this help? Why?
What was your strategy for comparing numbers?
Could you order the numbers in the opposite way?
Does any number stay in the same place when we do this? Why?

Varied Fluency

- Order the numbers from greatest to smallest.

  13 18 15

- Three children were playing basketball.
  The scoreboard shows how many hoops they scores each.
  The winner is the child who scores the most hoops.

  Eva: 9
  Jack: 16
  Tommy: 13

  Place the children in 1st, 2nd and 3rd

- Order the numbers from greatest to smallest:

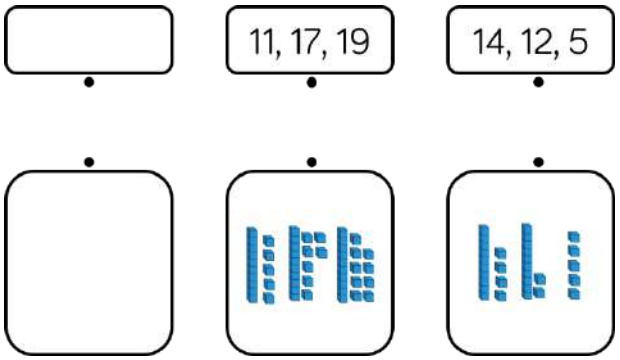
  - 12, 5, 7
  - 20, 17, 11

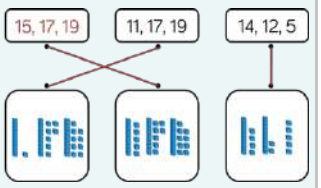
  Now order them from smallest to greatest. What do you notice?

Order Numbers

Reasoning and Problem Solving

Complete the image and match the numerals to the correct picture.





Order the numbers in each group from smallest to largest.

5, 12, 14
15, 17, 19
11, 17, 19

Order all of the numbers from smallest to largest.

5, 11, 12, 14, 15, 17, 17, 19, 19

Mr Monaghan says,

What could his number be?

Possible answers:

9, 10, 11, 12, 13 or 14

Spring Scheme of Learning

Year 1

#MathsEveryoneCan

2020-21

White Rose Maths

New for 2020/21

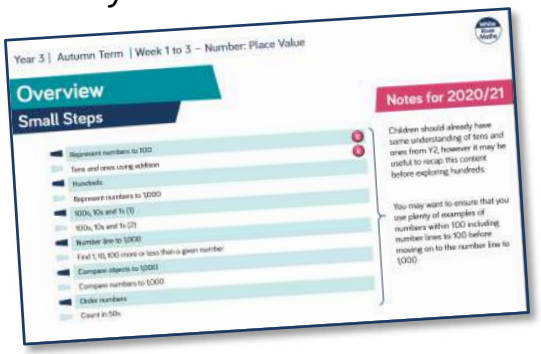
2020 will go down in history. The world has changed for all of us.

We want to do as much as we can to support children, teachers, parents and carers in these very uncertain times.

We have amended our schemes for 2020/21 to:

- ★ highlight key teaching points
- ★ recap essential content that children may have forgotten
- ★ flag any content that you might not have covered during the school closures period.

We hope these changes will add further value to the schemes and save you time.



Lesson-by-lesson overviews

We've always been reluctant to produce lesson-by-lesson overviews as every class is individual and has different needs. However, many of you have said that if blended learning becomes a key feature of school life next year, a weekly plan with linked content and videos could be really useful.

As always, we've listened! We've now produced a complete lesson-by-lesson overview for Y1 to Y9 that schools can use or adapt as they choose. Each lesson will be linked to a free-to-use home learning video, and for premium subscribers, a worksheet. This means that you can easily assign work to your class, whether they are working at home or in school.

Inevitably, this lesson-by-lesson structure won't suit everyone, but if it works for you, then please do make use of this resource as much as you wish.

Teaching for Mastery

These overviews are designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the new National Curriculum.

The overviews:

- have number at their heart. A large proportion of time is spent reinforcing number to build competency
- ensure teachers stay in the required key stage and support the ideal of depth before breadth.
- ensure students have the opportunity to stay together as they work through the schemes as a whole group
- provide plenty of opportunities to build reasoning and problem solving elements into the curriculum.

For more guidance on teaching for mastery, visit the NCETM website:

https://www.ncetm.org.uk/resources/47230

Concrete - Pictorial - Abstract

We believe that all children, when introduced to a new concept, should have the opportunity to build competency by taking this approach.

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – alongside this children should use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support children's understanding of abstract methods.

Need some CPD to develop this approach? Visit www.whiterosemaths.com for find a course right for you.

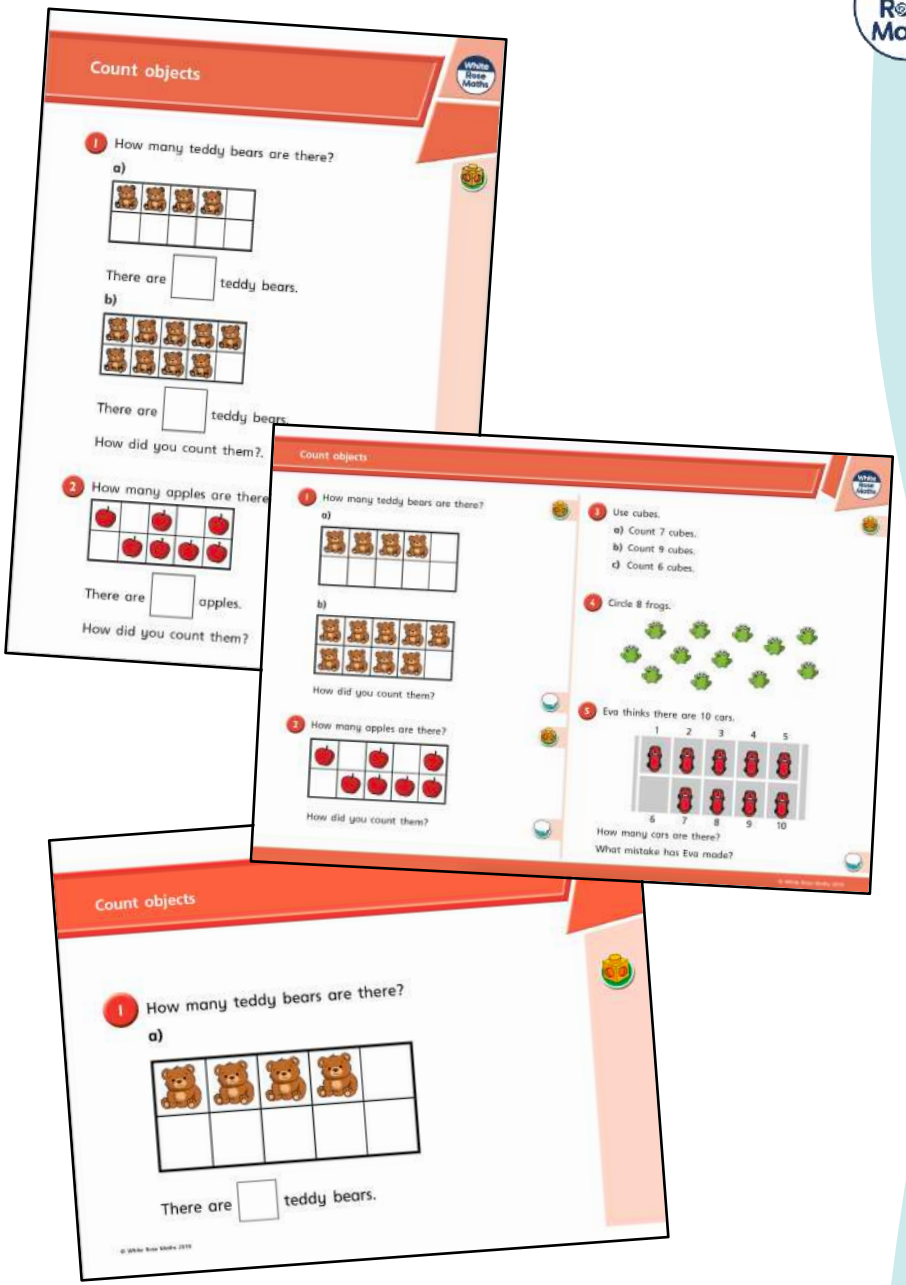
Supporting resources

We have produced supporting resources for every small step from Year 1 to Year 11.

The worksheets are provided in three different formats:

- Write on worksheet – ideal for children to use the ready made models, images and stem sentences.
- Display version – great for schools who want to cut down on photocopying.
- PowerPoint version – one question per slide. Perfect for whole class teaching or mixing questions to make your own bespoke lesson.

For more information visit our online training and resources centre resources.whiterosemaths.com or email us directly at resources@whiterosemaths.com



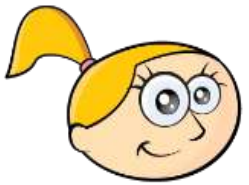
Meet the Characters

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

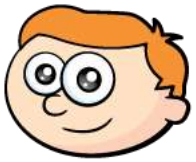

Whitney


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)	
Spring	Consolidation	Number: Addition and Subtraction (within 20)			Number: Place Value (within 50)			Measurement: Length and Height		Measurement: Weight and Volume		Consolidation
Summer	Consolidation	Number: Multiplication and Division			Number: Fractions		Geometry: Position and Direction	Number: Place Value (within 100)		Measurement: Money	Measurement: Time	

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

Notes for 2020/21

Addition within 10 is a vital topic in year 1 therefore we have given these concepts more time within our scheme of learning.

If children have a firm grasp of these concepts they will have a strong foundation to build upon in later years.

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

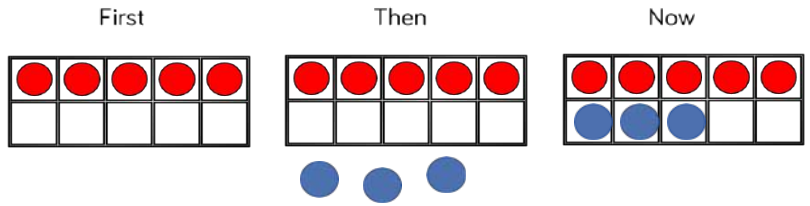
What number did you start with? Then what happened? Now what do I have?

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?

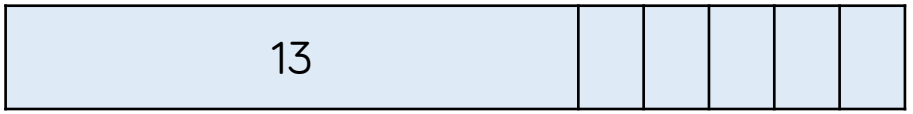
Varied Fluency

Use ten frames to complete the number story.

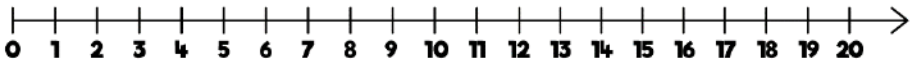


First there were ___ cars in the car park.
Then ___ more cars parked in the car park.
Now there are ___ cars in the car park.

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

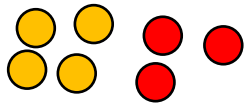
Reasoning and Problem Solving

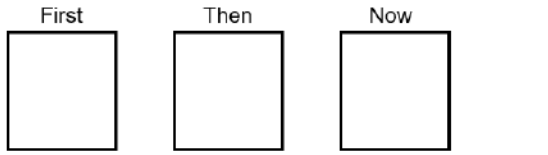
Use the diagram and counters to tell your own number story for these calculations:

$0 + 12 = \_\_\_$

$7 + 0 = \_\_\_$

$14 + \_\_\_ = 17$





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,

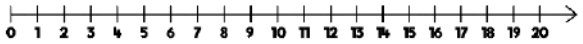
12, 13, 14, 15, 16, 17, 18

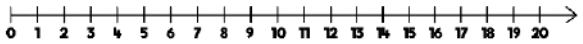
Use a number line to show who is correct.

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?

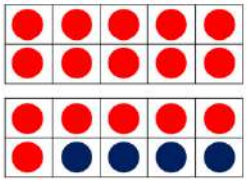
What number bond can we see? How does this help us find the number bond to 20?

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

Varied Fluency

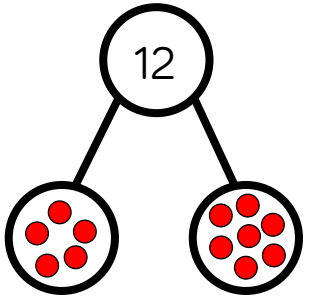
What number bond is represented in the pictures?

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?

$$7 + 3 = 10$$

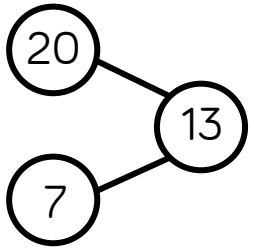
$$17 + 3 = 20$$

$$20 = 7 + 13$$

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?

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

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?

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

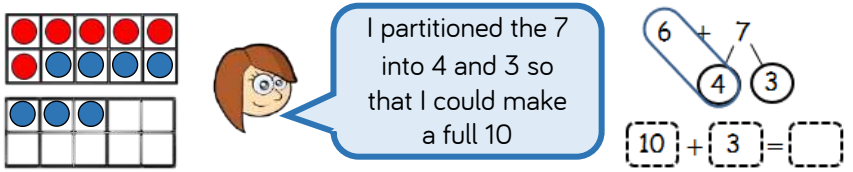
How can you partition a number and use your number bonds to 10 to help you?

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

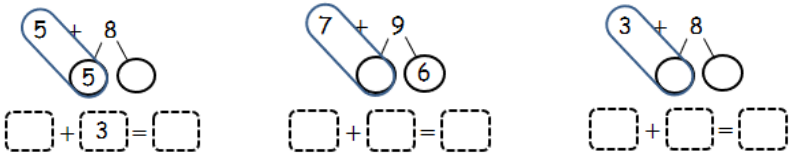
How does using a number line help you to see this strategy?

Varied Fluency

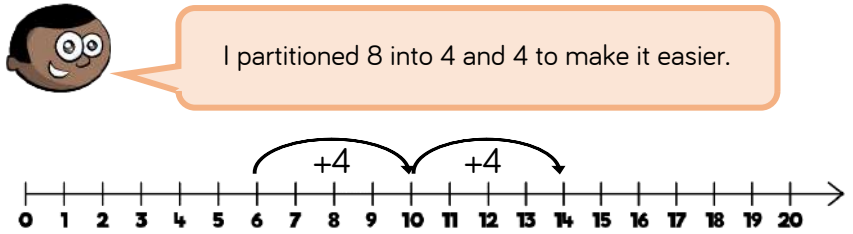
Rosie has used the 10 frames to calculate 6 + 7



Use Rosie's method to complete:



Mo has used a number line to calculate 6 + 8



Use Mo's method to calculate:

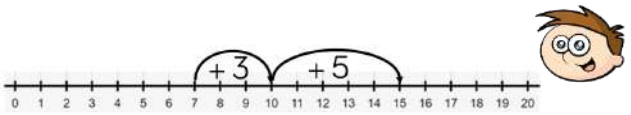
5 + 8 = ☐ 9 + 4 = ☐ 6 + 8 = ☐

Add by Making 10

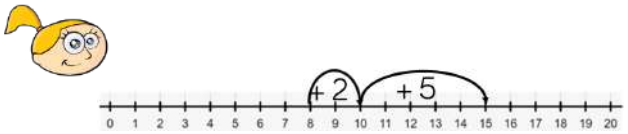
Reasoning and Problem Solving

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

Teddy shows it this way:



Eva shows it this way:



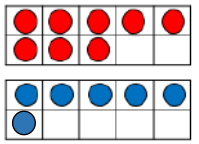
Who is correct?
Explain your answer.

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

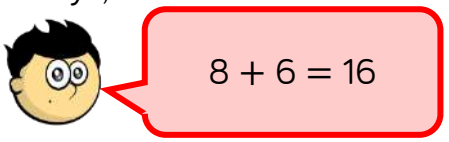
Teddy has started with 7 and partitioned the 8 into 3 and 5 to make 10

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.



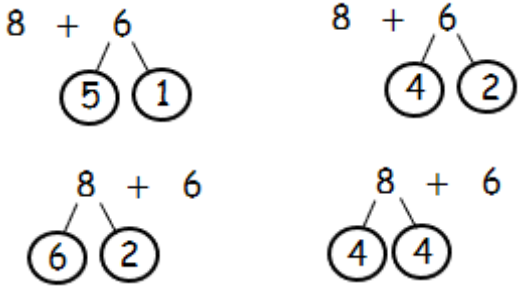
He says,



Do you agree?
Explain why.

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

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



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

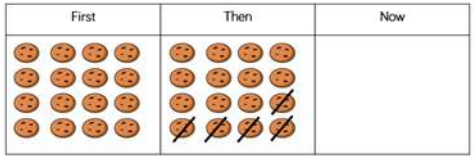
How many objects were there at first? Then what happened to the objects? How many objects are there now?

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?

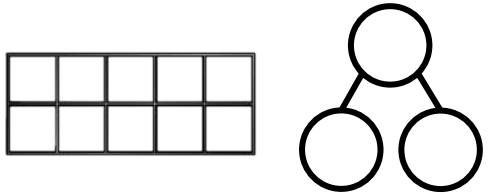
If Mo ate all of the biscuits, what number would we be left with? How do we write this as a calculation? What does the zero represent in this calculation?

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 = ___

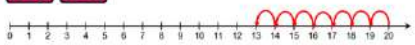


First there were 9 sheep. Then they all ran away.
How many sheep are left?
Use ten frames and counters to represent the sheep.



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

20 – 7 = ___



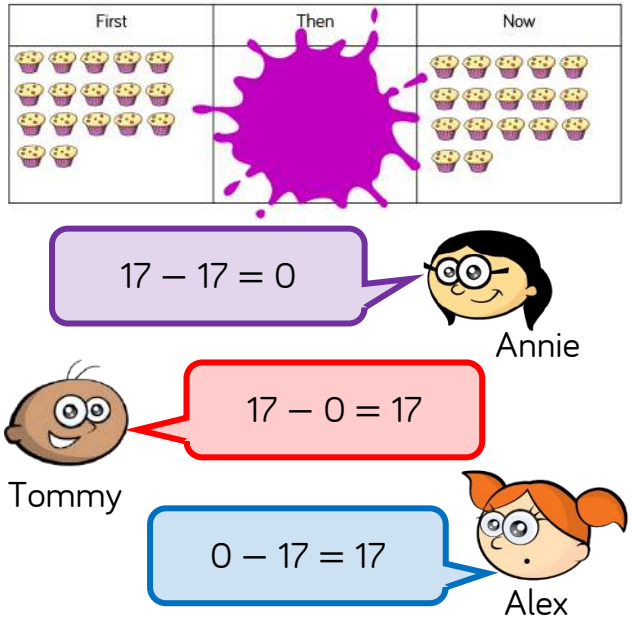
Use this method to calculate:

20 – 8
18 – 6
19 – 4

Subtraction – Not Crossing 10

Reasoning and Problem Solving

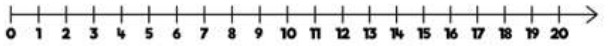
Annie, Tommy and Alex are working out which calculation is represented below.



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.



□ – □ = 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?

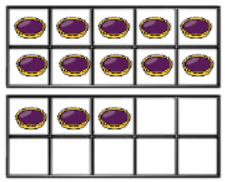
How does using the counters help you to see this strategy?

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

Can you think of another way to represent this problem?

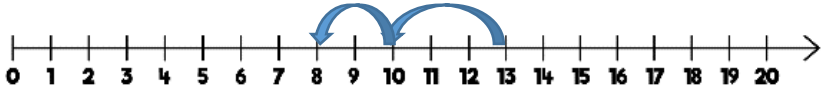
Varied Fluency

First there were 13 jam tarts

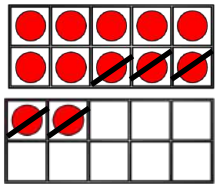


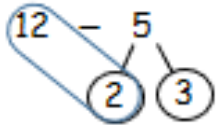
Then 5 were eaten

Now there are 8 jam tarts.



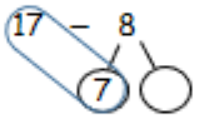
Rosie has used the ten frames to calculate 12 – 5



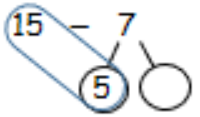


10 – 3 = 7

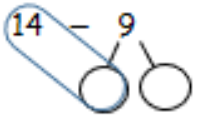
Use her method to complete:



10 – ☐ = ☐



☐ – ☐ = ☐



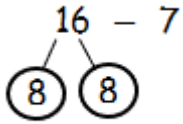
☐ – ☐ = ☐

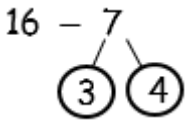
Subtraction – Crossing 10 (1)

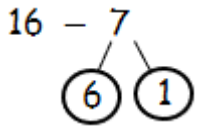
Reasoning and Problem Solving

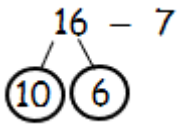
Rosie is calculating 16 – 7

Which of these methods is most helpful? Why?









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?

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

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.

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

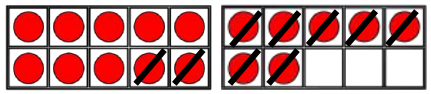
How do the counters and bar models help you to subtract?

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

Did you count forwards or backwards? Why?

Varied Fluency

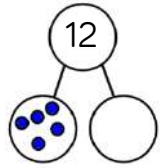
- Complete the number sentences to describe what happens to the sweets.



First there were ___ sweets.
Then ___ sweets were eaten.
Now there are ___ sweets.

□ – □ = □

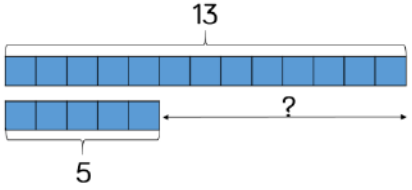
- There are 12 cars in the car park.
5 of them are blue.
How many are red?



□ – □ = □

___ of the cars are red.

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



□ – □ = □

Subtraction – Crossing 10 (2)

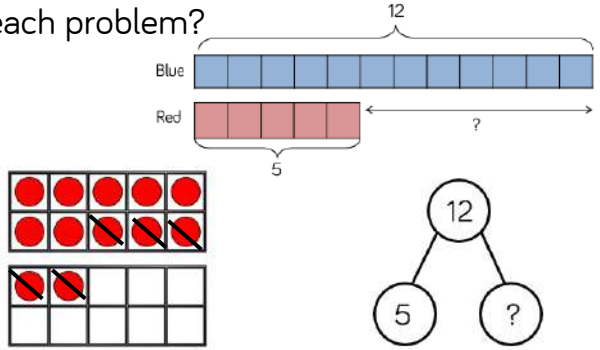
Reasoning and Problem Solving

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.
There 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?

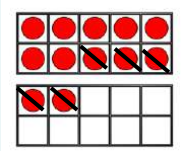
Which method would you use to solve each problem?



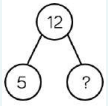
Ask the children to justify which method they would use and why.

Possible answers:

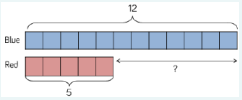
A Take away



B Partitioning



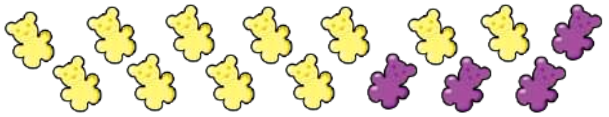
C Difference



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.



Teddy works out these calculations.

15 – 4 = ___
15 – 11 = ___
11 – 4 = ___

What question could he have asked each time?

15 – 4 = 11 (Teddy has 15 bears. He eats 4. How many are left?)
15 – 11 = 4 (11 are yellow how many are purple?)
11 – 4 = 7 (How many more yellow bears are there?)

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?

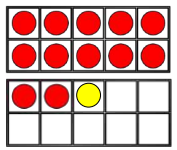
If we know 12 + 1 = 13, what else do we know?

Can you see any patterns?

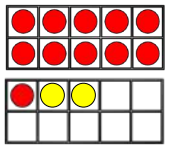
If we know that 15 – 3 = 12, why can't we say 3 – 15 = 12?

Varied Fluency

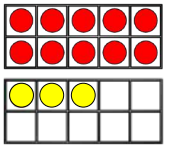
Complete the addition sentences.



12 + 1 = 13



11 + ___ = 13



__ + __ = __

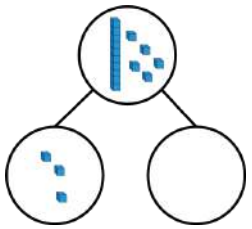
Can you write a subtraction sentence for each?

13 – 1 = 12

13 – ___ = ___

__ – __ = ___

Complete:



15 – ___ = 3
15 – 3 = ___
3 + ___ = 15
___ + 3 = 15

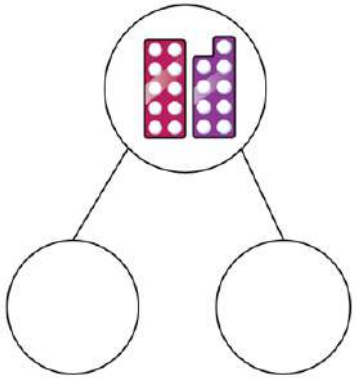
Complete and write addition and subtraction sentences for each bar model.

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.

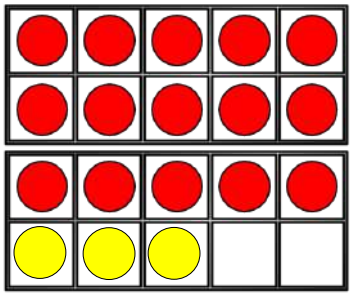


nine	add
ten	subtract
nineteen	is equal to

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

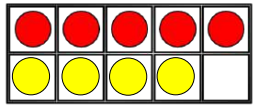
What do each of the symbols mean?

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 = ___ – 2

Varied Fluency

Which card completes the number sentence?

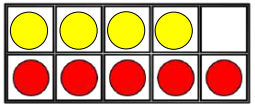


5 + 4

is more than

is less than

is equal to



4 + 5

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

3 + 8 ◯ 8 + 3

18 – 5 ◯ 18

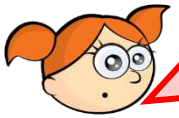
12 + 4 ◯ 12 – 4

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

13 – 5 < 13 – ___
16 – 4 = ___ + 4
9 + ___ > 9 + 1

Compare Number Sentences

Reasoning and Problem Solving



Alex

Any number less than 11 would make this correct.

$7 + 11 < 7 + \_\_$

Do you agree with Alex?

Explain why.

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

Whitney has 16 sweets and eats 7 of them.

Mo has 17 sweets and eats 8 of them.

Who has more sweets left?

Explain how you know.

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

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

$14 - 5 \bigcirc 14 + 5$

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

Do you agree with Dexter?
Explain why.

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 <

White Rose Maths

Spring - Block 2

Place Value (within 50)

Overview

Small Steps

- 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

Notes for 2020/21

This block builds on previous learning on place value.

Spend time consolidating work with smaller numbers before moving on to numbers within 50.

Links should be made between numbers below 10 so that children are constantly using their prior learning to help them.

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?

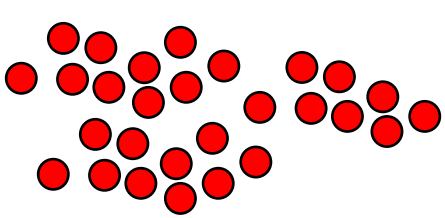
Varied Fluency

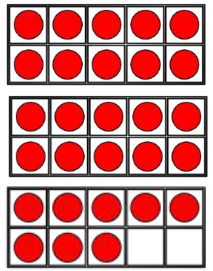
Use the number track to
- count forwards from 35 to 49
- count back from 46 to 38

35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

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?





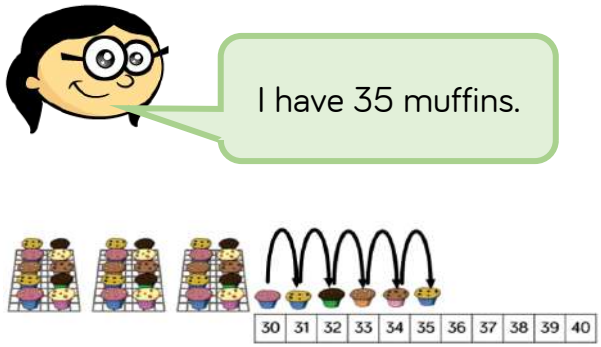
How many muffins are there?

40	41	42	43	44	45	46	47	48	49	50

Numbers to 50

Reasoning and Problem Solving

Annie counts how many muffins she has.



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

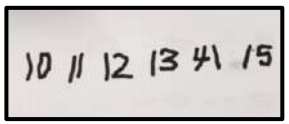
Will she say the number 39?
Will she say the number 29?
Will she say the number 19?

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:

Whitney writes:



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.

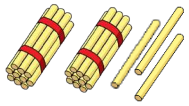
It is important that children understand how a number is made up of tens and ones, e.g. 34 = 3 tens and 4 ones.

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?

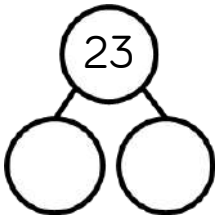
Varied Fluency

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

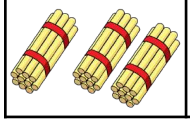
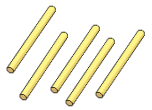


There are ___ tens and ___ ones.

___ tens + ___ ones = 23



What number is represented in the grid?

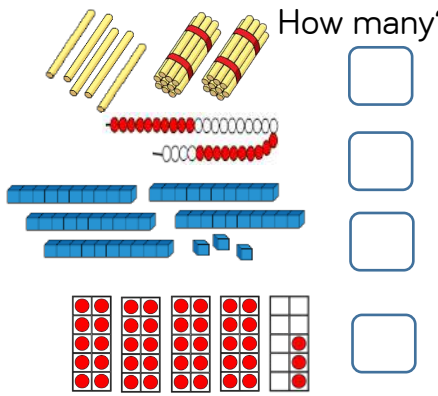
Tens	Ones
	

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

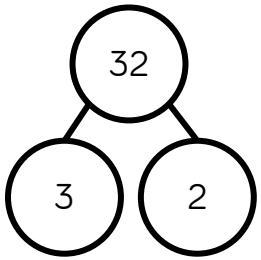
How many?



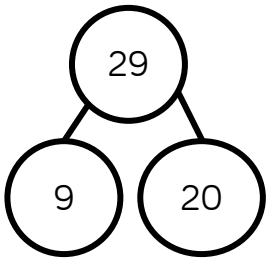
Tens and Ones

Reasoning and Problem Solving

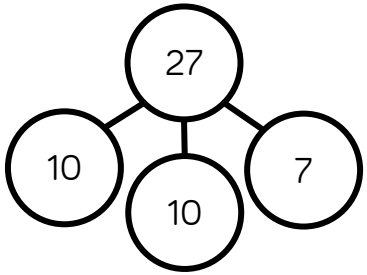
The children are completing the part whole models.



Tommy



Rosie



Jack

Are they correct?
Explain why.

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

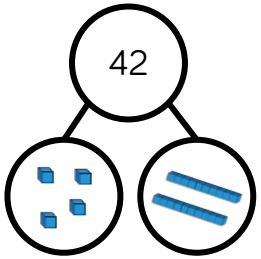
Rosie is correct – she has just recorded the ones first.

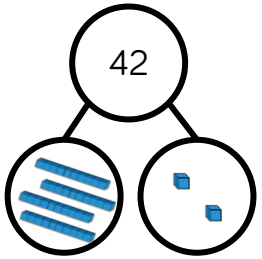
Jack is correct.
10 + 10 = 20
Two tens is the same as twenty.

Dora and Amir both try to build the same number.

Dora

Amir





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?

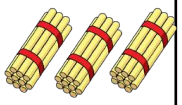
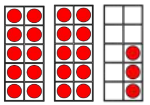
How many tens are there? How many ones?

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

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

Varied Fluency

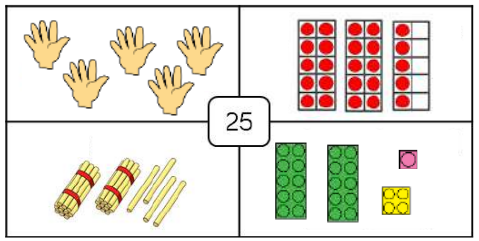
Complete the table.

Number	Tens and Ones	Ten Frame	Straws	Words
26	2 tens 6 ones			Twenty-six
	___ tens ___ ones			Thirty
	___ tens ___ ones			
	___ tens ___ ones			Seventeen

How many different ways can you represent the following numbers?

- 34
- 28
- 40
- 16

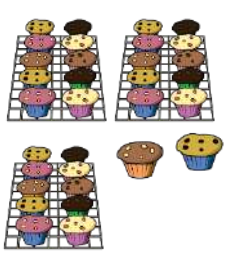
Here is an example for 25

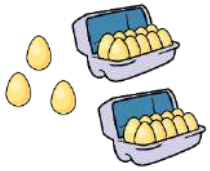


Represent Numbers to 50

Reasoning and Problem Solving

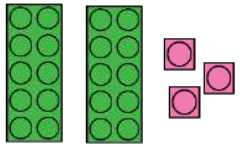
Sort the representations in to two groups.





23

Three tens and 2 ones



Twenty and three

Explain how you have sorted them.

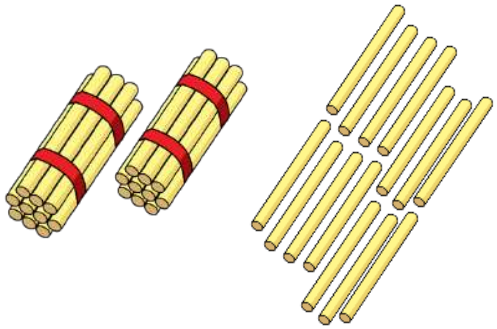
Can you add your own representations?

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.

One More One Less

Notes and Guidance

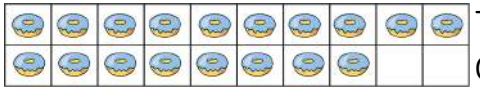
Children find one more and one less than given numbers up to 50. Children build numbers concretely before using number tracks and 1–50 grids. As they have already found one more and one less within 10 and 20, they should be able to use this knowledge with larger numbers. Encourage them to notice that 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?

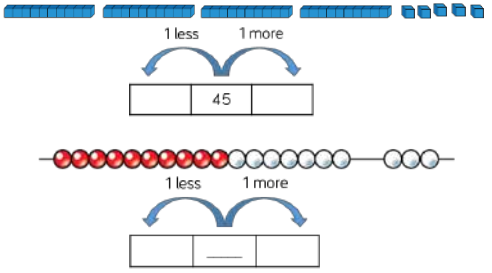
Varied Fluency

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 ___

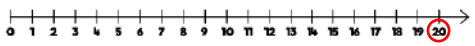
Find one more and one less:

36	37	38	39	40	41	42	43	44	45

One more than ___ is ___
One less than ___ is ___

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 ___

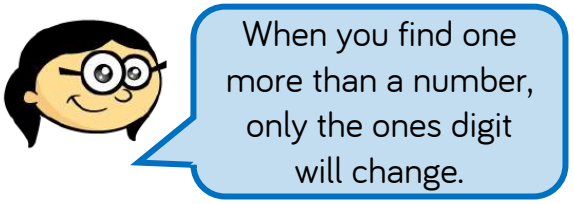


One more than ___ is ___
One less than ___ is ___

One More One Less

Reasoning and Problem Solving

Always, sometimes, never…



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 ☐

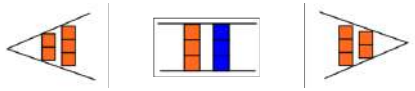
26
35
45
49

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?

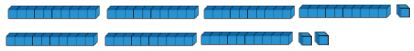
Can you record your ideas in a different way?

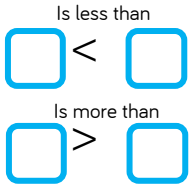
Varied Fluency

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

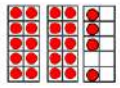
___ is more than ___
___ > ___
_____ has more muffins.

- 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 

Eva 

Jack says:

I have more.

Eva says:

I have more.

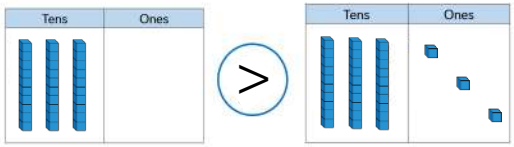
Who is right?
Practise comparing objects with your friend.

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

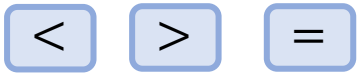


Do you agree with Dexter?

Explain your answer.

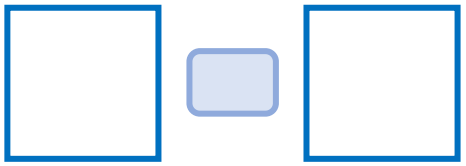
Dexter is correct but he has used the wrong symbol.

Pick a card.



=

Draw pictures in the boxes to make the comparison true.



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.

19	20	21	23	24	25	26	27	28	29

21 is _____ than 26

26 is _____ than 21

21 ◯ 26 26 ◯ 21

29	30	31	32	33	34	35	36	37	38

☐ is more than ☐

☐ is less than ☐

☐ > ☐ ☐ < ☐

Use the 1-50 grid to compare the numbers.

12 ◯ 21

38 ◯ nineteen

40 ◯ 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 ◯ 50

28 ◯ 29

48 ◯ 39

2 tens < ☐

Compare Numbers within 50

Reasoning and Problem Solving

Teddy is comparing two numbers.

My number is larger than 19 but not one more than 19

23	>	

What could Teddy's number be?

What can't it be?

Teddy's number could be 21 or 22
It can't be 20 as this is one more than 19

Dora compares the two values.

23	<	3 tens and 3 ones

Change one thing in the values so they are equal.

Dora could change 23 = 2 tens and 3 ones or 33 = 3 tens and 3 ones.

Pick two dominoes to represent two two-digit numbers.
For example,

43 21

Then compare them using <, > or =
43 > 21 21 < 43
Explain how you know.

Children could do this with a partner.

Possible response:
43 is larger than 21 as it has more tens.

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?

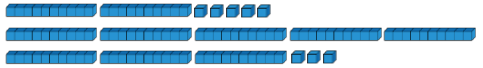
Can you build the groups using equipment and compare?

What is the smallest/largest number that could complete the empty box?

Varied Fluency

Order the groups of cubes from smallest to largest.

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

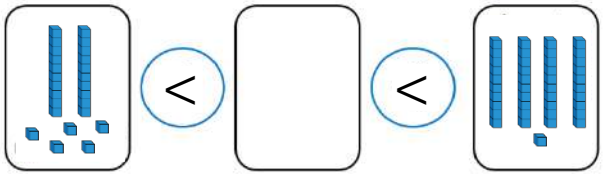
Spot the Mistake

$12 > 21 > 33 > 35$

Can you correct it?

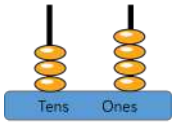
The wrong inequality symbol has been used.
It should be
$12 < 21 < 33 < 35$
or
$35 > 33 > 21 > 12$

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

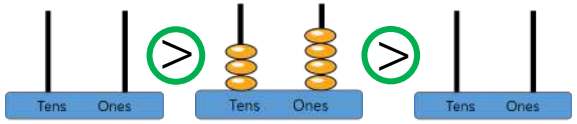


Any number from 27 to 40

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.

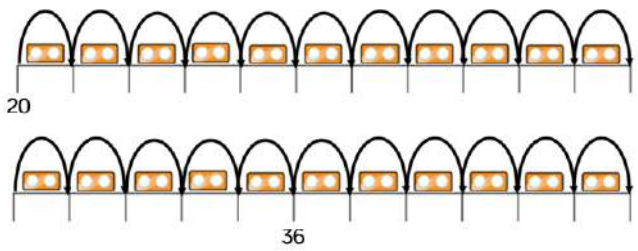
How many gloves are there?

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

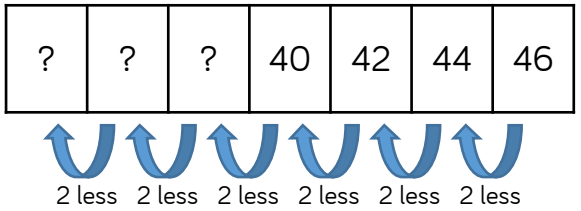
Complete the number lines by counting in 2s.



Count in 2s

Reasoning and Problem Solving

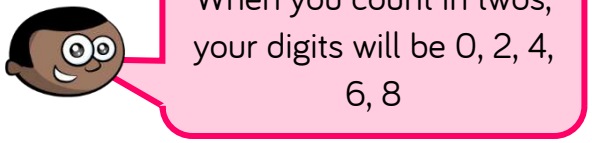
Count in 2s backwards to complete the number track.



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

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

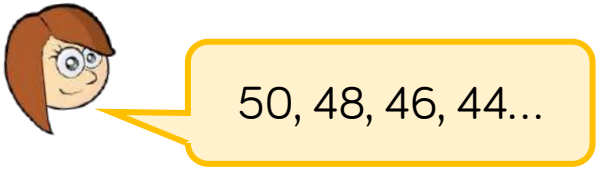
Always, sometimes, never...

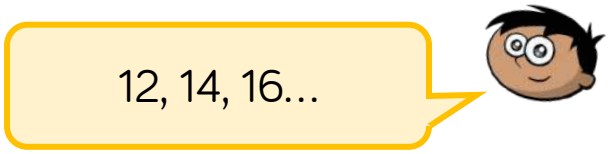


Prove it!

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.





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.

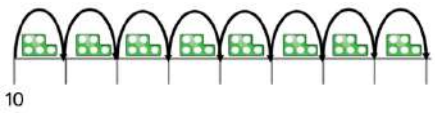
How many grapes are there?

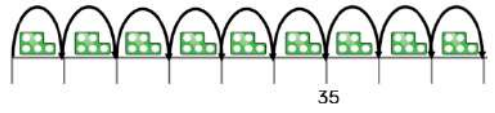
There are ___ grapes in each bunch.
There are ___ bunches.
There are ___ grapes altogether.

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.

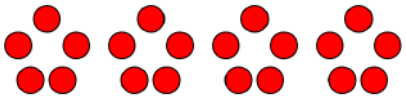




Count in 5s

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

30

27

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)

Notes for 2020/21

This should be a very practical block of learning and prior learning on place value and addition and subtraction can be consolidated and extended.

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

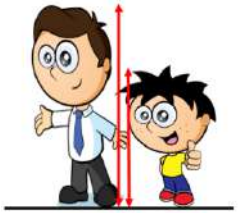
Which person is taller/shorter?
Which pencil is shorter/longer?

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

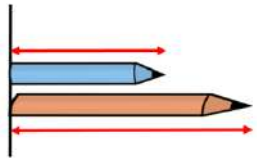
- Use the words **taller** and **shorter** in the sentence stems to compare the height of the man and the boy.



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.

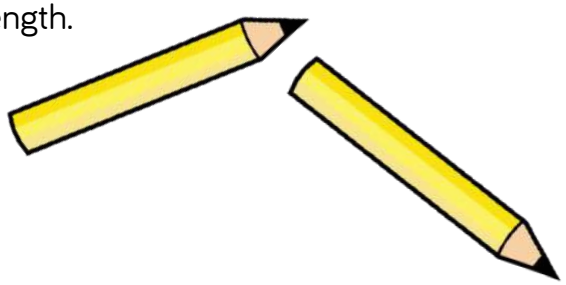
Mo

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?

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

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?

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?

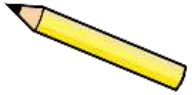
What could you use to measure how tall you are? Is it easier to measure someone lying down or standing up?

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)

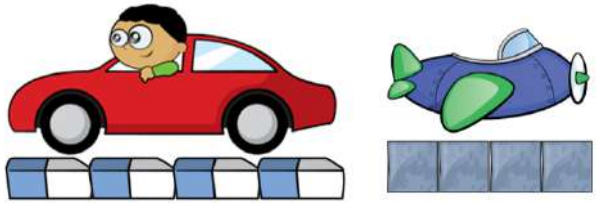
Reasoning and Problem Solving

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?

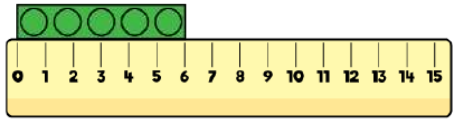
Does the ruler look like anything else we have used? (number line)

Can you count how many cm the _____ measures?

How does using a ruler help us to compare objects?

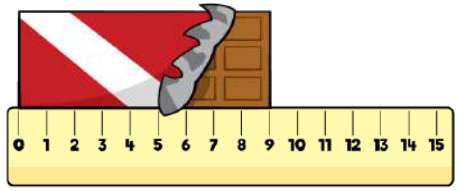
Varied Fluency

How long is the building block?



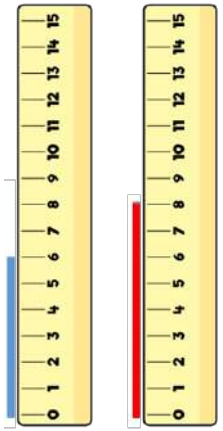
The building block is ☐ cm.

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.

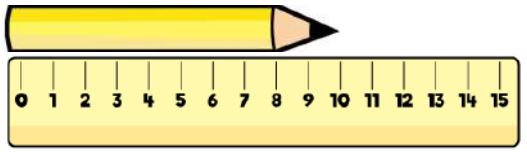
The ☐ straw is the tallest.

The ☐ straw is the shortest.

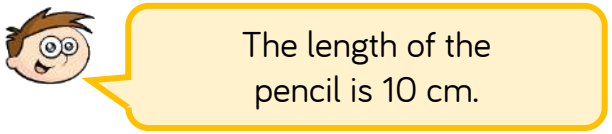
Measure Length (2)

Reasoning and Problem Solving

Teddy measures the length of the pencil.



He says,

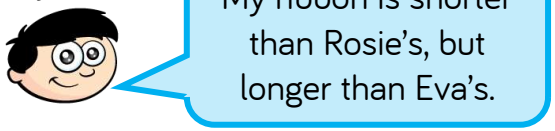


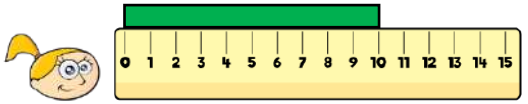
Do you agree with Teddy?
Explain why.

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

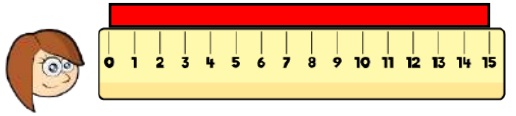
Eva, Dexter and Rosie are comparing ribbons that they have.
Unfortunately, Dexter has lost his ribbon.

He says,

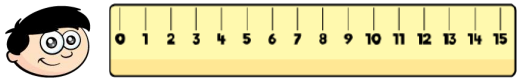




Eva



Rosie



Dexter

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

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

Notes for 2020/21

Measuring and comparing activities can be brought to life using real examples that will develop children's understanding of the world around them.

Similarly to the length and height block, this block is useful to consolidate place value and addition and subtraction.

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.

The balance will be level because they are both red.

Whitney

Mo

The apple will go down because it is lighter.

The balloon will go up because it is lighter.

Teddy

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?

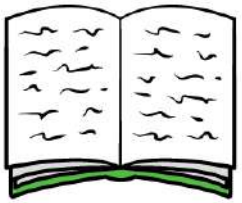
Varied Fluency

- 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?

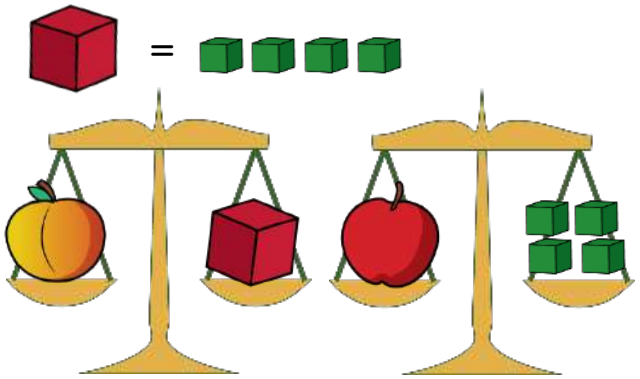


Counters
Wooden blocks
Pencils

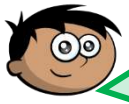
Why?

Measure Mass

Reasoning and Problem Solving

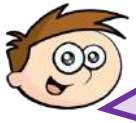


Amir says,



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.

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

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

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

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?

 = 3 pencils

Ball

 = 8 pencils

Teddy Bear

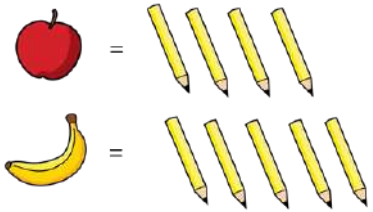
 = 4 pencils

Sock

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

Compare Mass

Reasoning and Problem Solving



Complete the sentences below:

The _____ is heavier than the _____ .

The _____ is lighter than the _____.

The _____ weighs ____ pencils.

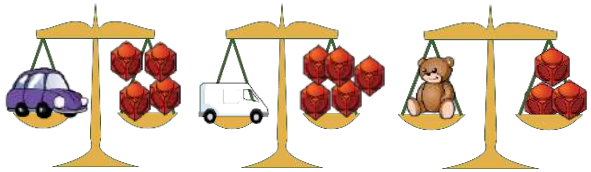
The banana is heavier than the apple.

Children may also notice

The banana weighs one more pencil than the apple.

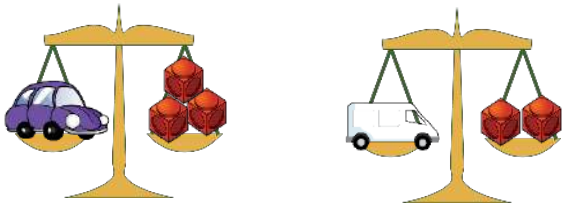
Can you match the clue to the images?

- 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.

T
F
F
T
F

Can you make a problem like this for your partner?

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?

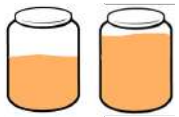
How can we measure the capacity of this container?

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.

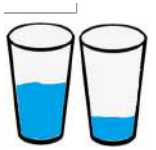
- Use the words 'more' or 'less' to compare the containers.



A has _____ than B.

A B

A has _____ than B.



A B

- Put these in order from empty to full.

A B C D

empty full

Introduce Capacity and Volume

Reasoning and Problem Solving

Always, Sometimes, Never?

The tallest container holds the most liquid.

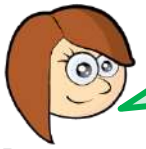
Identical containers can have a different capacity.

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.



My glass has more water than Teddy's.

Rosie

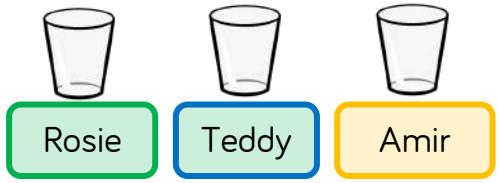
My glass is nearly full.

Teddy

My glass has less water than Rosie's.

Amir

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?

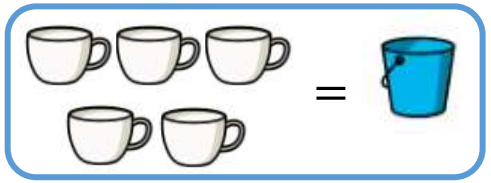
How is this different? How is this the same?

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?

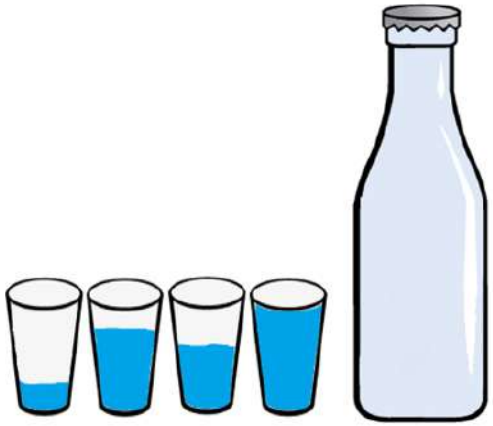
Four buckets?

What do you notice?
Can you continue the pattern?

Measure Capacity

Reasoning and Problem Solving

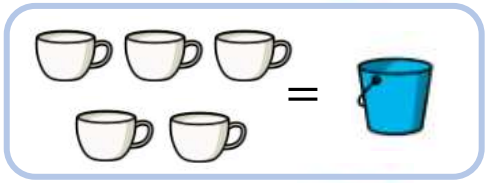
Whitney pours her cups into the bottle and they fill it exactly.



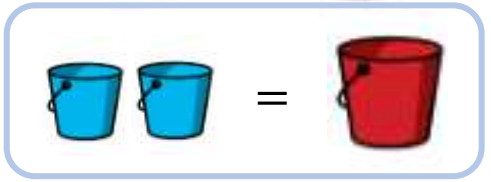
She says the bottle has a capacity of four cups. Do you agree?

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?

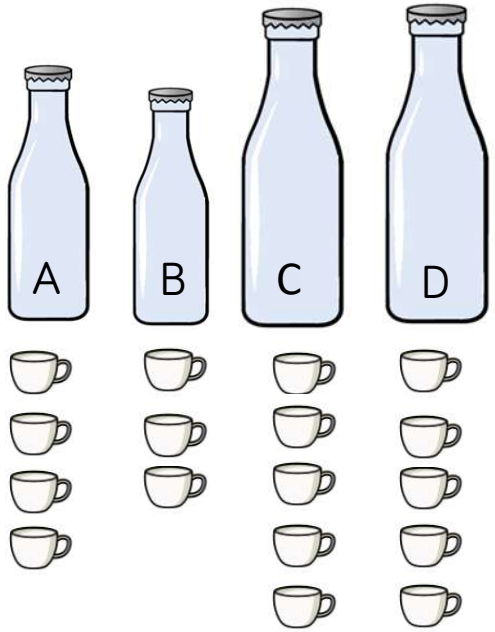
Can we show A has more than B but less than C?

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:



□ > □

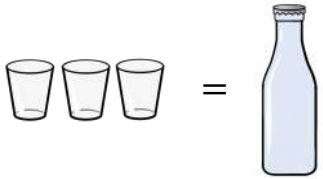
□ < □

□ = □

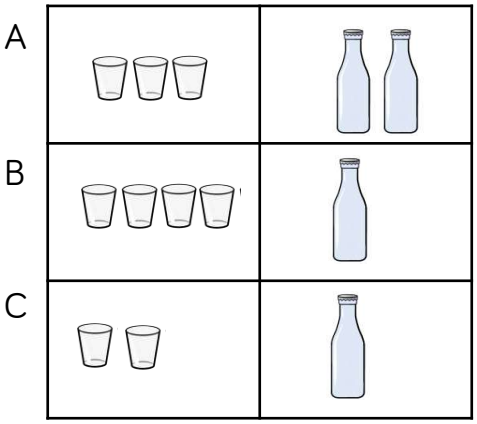
Compare Capacity

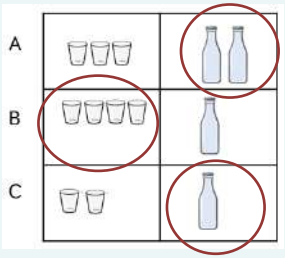
Reasoning and Problem Solving

If

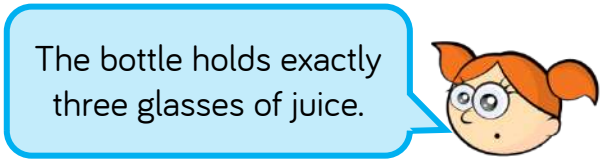


Circle whether the glasses or bottles hold more in each row:





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



Do you agree? Explain why.

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

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

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

Summer Scheme of Learning

Year 1

#MathsEveryoneCan

2020-21

White Rose Maths

New for 2020/21

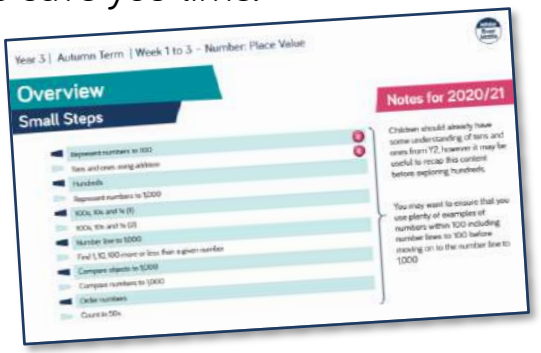
2020 will go down in history. The world has changed for all of us.

We want to do as much as we can to support children, teachers, parents and carers in these very uncertain times.

We have amended our schemes for 2020/21 to:

- ★ highlight key teaching points
- ★ recap essential content that children may have forgotten
- ★ flag any content that you might not have covered during the school closures period.

We hope these changes will add further value to the schemes and save you time.



Lesson-by-lesson overviews

We've always been reluctant to produce lesson-by-lesson overviews as every class is individual and has different needs. However, many of you have said that if blended learning becomes a key feature of school life next year, a weekly plan with linked content and videos could be really useful.

As always, we've listened! We've now produced a complete lesson-by-lesson overview for Y1 to Y9 that schools can use or adapt as they choose. Each lesson will be linked to a free-to-use home learning video, and for premium subscribers, a worksheet. This means that you can easily assign work to your class, whether they are working at home or in school.

Inevitably, this lesson-by-lesson structure won't suit everyone, but if it works for you, then please do make use of this resource as much as you wish.

Teaching for Mastery

These overviews are designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the new National Curriculum.

The overviews:

- have number at their heart. A large proportion of time is spent reinforcing number to build competency
- ensure teachers stay in the required key stage and support the ideal of depth before breadth.
- ensure students have the opportunity to stay together as they work through the schemes as a whole group
- provide plenty of opportunities to build reasoning and problem solving elements into the curriculum.

For more guidance on teaching for mastery, visit the NCETM website:

https://www.ncetm.org.uk/resources/47230

Concrete - Pictorial - Abstract

We believe that all children, when introduced to a new concept, should have the opportunity to build competency by taking this approach.

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – alongside this children should use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support children's understanding of abstract methods.

Need some CPD to develop this approach? Visit www.whiterosemaths.com for find a course right for you.

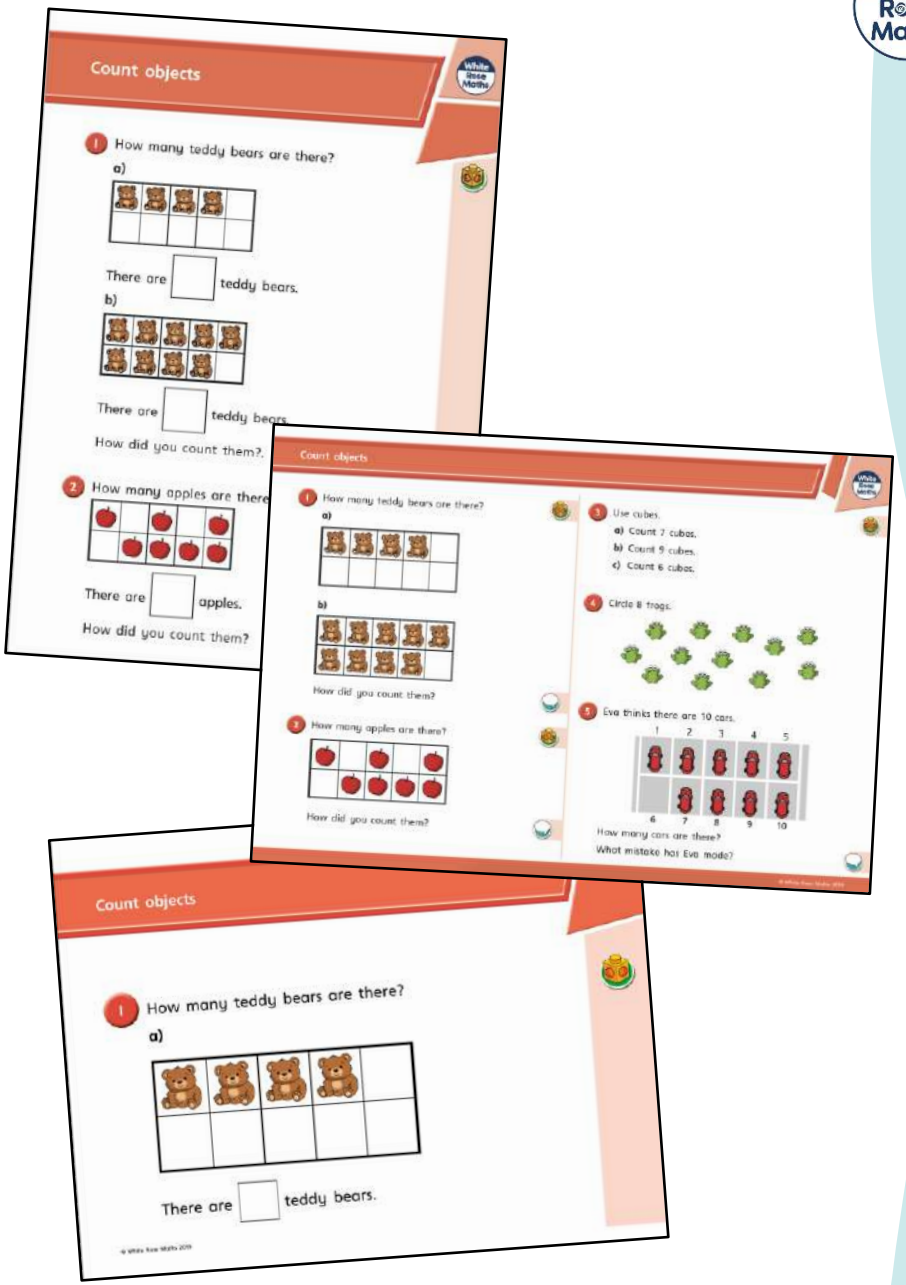
Supporting resources

We have produced supporting resources for every small step from Year 1 to Year 11.

The worksheets are provided in three different formats:

- Write on worksheet – ideal for children to use the ready made models, images and stem sentences.
- Display version – great for schools who want to cut down on photocopying.
- PowerPoint version – one question per slide. Perfect for whole class teaching or mixing questions to make your own bespoke lesson.

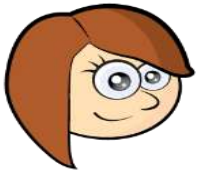
For more information visit our online training and resources centre resources.whiterosemaths.com or email us directly at resources@whiterosemaths.com



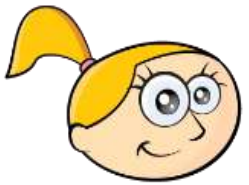
Meet the Characters

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

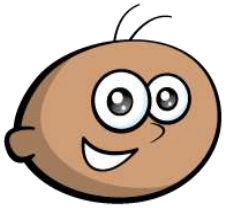

Alex


Jack

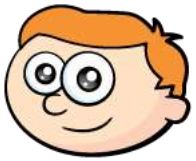

Whitney


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)	
Spring	Consolidation	Number: Addition and Subtraction (within 20)			Number: Place Value (within 50)			Measurement: Length and Height		Measurement: Weight and Volume		Consolidation
Summer	Consolidation	Number: Multiplication and Division			Number: Fractions		Geometry: Position and Direction	Number: Place Value (within 100)		Measurement: Money	Measurement: Time	

White Rose Maths

Summer - Block 1

Multiplication & Division

Overview

Small Steps

1. Count in 2s (R)
2. Count in 5s (R)
3. Count in 10s
4. Make equal groups
5. Add equal groups
6. Make arrays
7. Make doubles
8. Make equal groups – grouping
9. Make equal groups - sharing

Notes for 2020/21

We have chosen to revisit counting in 2s and 5s from the spring term before children move on to look at counting in 10s. Practical equipment is encouraged throughout this block to help cement these essential mathematical concepts with children.

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

R

- How many socks are there?

There are ___ socks in total.

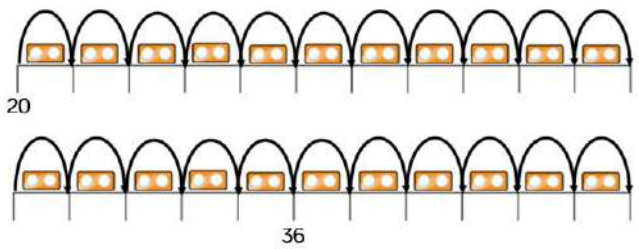
How many gloves are there?

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.

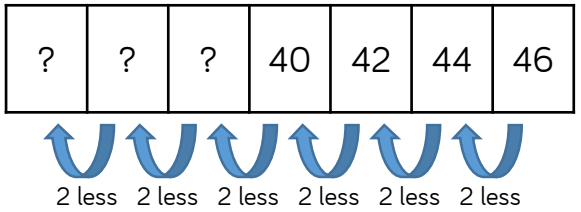


Count in 2s

Reasoning and Problem Solving

R

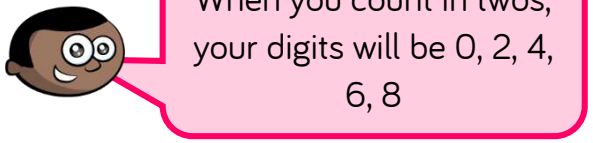
Count in 2s backwards to complete the number track.



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

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

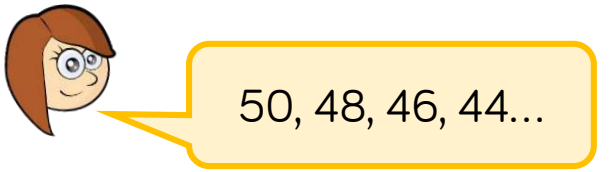
Always, sometimes, never...

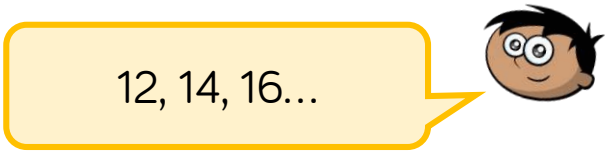


Prove it!

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.





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

R

How many fish are there?

There are ___ fish in each tank.
There are ___ tanks.
There are ___ fish altogether.

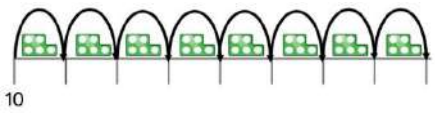
How many grapes are there?

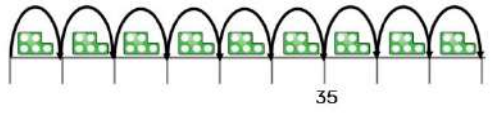
There are ___ grapes in each bunch.
There are ___ bunches.
There are ___ grapes altogether.

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.



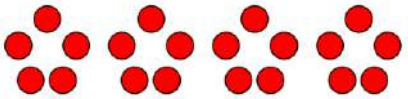


Count in 5s

Reasoning and Problem Solving

R

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.

Count in 10s

Notes and Guidance

Children count in groups of tens for the first time. Previously they have counted in 2s and 5s.
They use pictures, bead strings and number lines to support their counting.

Counting in 10s on a hundred square will also support children to see the similarities between the numbers when we count in tens.

Mathematical Talk

How many birds/flowers are there in total?

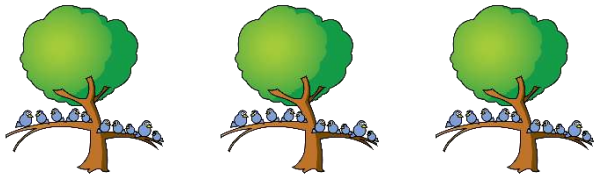
How can we use our number lines to help us count them?

Will _____ appear on our number line? Why?

What is the same about all the numbers we say when we are counting in tens?

Varied Fluency

How many birds are there altogether?



There are _____ birds in each tree.
There are _____ trees.
There are _____ birds altogether.

How many flowers are there altogether?

There are _____ flowers in each bunch.
There are _____ bunches.
There are _____ flowers altogether.

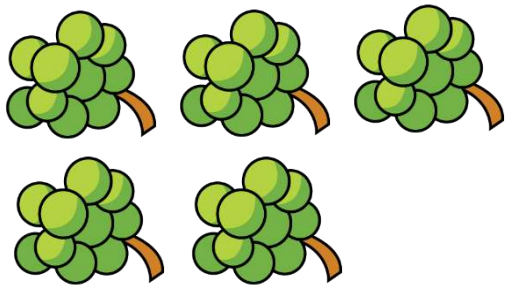
Use a 0-100 bead string to count in tens.
Can we count forwards and backwards in tens?

Can we count in tens on a number track as well?
How does this match counting on a bead string?

Count in 10s

Reasoning and Problem Solving

In a shop, grapes come in bunches of 10



Max wants to buy forty grapes.

Are there enough grapes?

Yes there are enough grapes. There are fifty grapes and Max only needs forty.

Jemima is counting in 10s on part of a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

She starts at 10

Shade in all the numbers Jemima will say.

What is the same about the numbers she says?

What is different about the numbers?

Jemima will say 10, 20, 30, 40 and 50
All the numbers have the same ones digit (0)
They all have different tens digit.
The tens digit goes up by 1 for each new number she says.

Making Equal Groups

Notes and Guidance

Children begin by using stories which link to pictures and concrete manipulatives to explore making equal groups and write statements such as 'there are ___ groups of ___.' They will recognise and explain how they know when they are equal or not. Children see equal groups that are arranged differently so they understand that the groups look different but can still be equal in number.
At this stage children do not explore multiplication formally.

Mathematical Talk

How do I know that the groups are equal? What does equal mean?

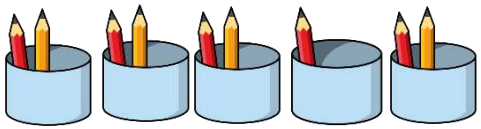
How many pencils are there in each pot? How can I complete the sentence to describe the groups?

What's the same and what's different?

Are Josh's groups equal or unequal? How can we make them equal?

Varied Fluency

Are the groups equal or unequal? Write a label for each.



Complete the sentences

There are ___ groups of ___ pencils.

There are ___ groups of ___ flowers.

Josh is drawing equal groups of 3

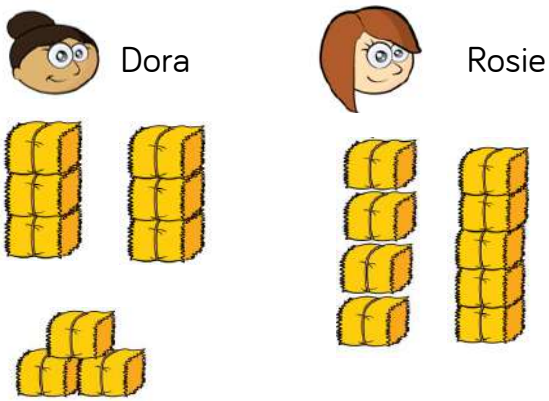
Complete his drawing.

Making Equal Groups

Reasoning and Problem Solving

Dora and Rosie are making hay bundles.

Who has made equal groups?



Explain how you know.

Possible answer:
Dora has made equal groups because she has 3 groups of 3 hay bundles.

Rosie has two unequal groups.

Use concrete materials or pictures to complete the questions.

Alex has 4 equal groups.
Show me what Alex's groups could look like.

Whitney has 3 unequal groups.
Show me what Whitney's groups could look like.

Children will show 4 groups where there are the same amount in each group for Alex and 3 groups that are unequal for Whitney.

Encourage children to do this in more than one way.

Add Equal Groups

Notes and Guidance

Children use equal groups to find a total. They focus on counting equal groups of 2, 5 and 10 and explore this within 50.
Children could begin by linking this to real life, for example animal legs, wheels, flowers in vases etc.
Stem sentences alongside number sentences can help children link the calculation with the situation. Ensure children have the opportunity to say their sentences aloud.

Mathematical Talk

How many apples are there in each bag?
Do all of the bags have an equal number of apples?
How many equal groups can you see?

How can we represent this with counters/cubes/on a number line/in a number sentence etc?

What other equipment could you use to represent your pattern? What's the same? What's different?

Which is more, 3 groups of 10 or 4 groups of 5? Prove why.

Varied Fluency

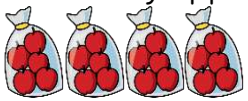
- How many wheels altogether?

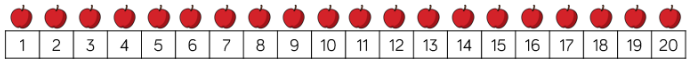
2 + 2 + 2 + 2 + 2 =

How many fingers altogether?

5 + 5 + 5 =

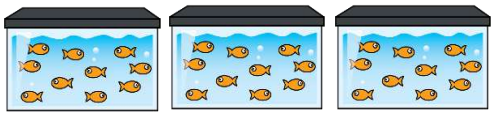
- How many apples are there? Complete the sentences.





5 + 5 + 5 + 5 = ____
There are ____ apples.
There are ____ groups of ____ apples which is equal to ___

- How many fish are there?
Complete the sentences.



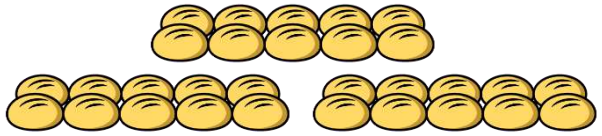
___ + ___ + ___ = ___
There are ____ fish.

Can you show this using ten frames?

Add Equal Groups

Reasoning and Problem Solving

Eva and Whitney are making equal groups of bread rolls.



Eva

We need one more group to make 40

We need 10 more rolls to make 40

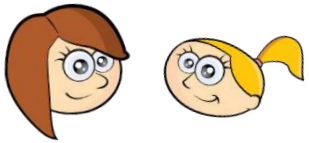
Whitney

Who do you agree with? Explain why.

Possible answer:
I agree with both.

They are counting in groups of 10 so they need one more group of 10

Rosie and Eva have equal groups of either 2, 5 or 10



Each of their totals is less than 40

Rosie has 5 equal groups.
Eva has 3 equal groups.

Eva's total is more than Rosie's total.

What could they be counting in?

Use equipment to help you.

Possible answers:

Rosie: 2 + 2 + 2 + 2 + 2 = 10
Eva: 5 + 5 + 5 = 15

Rosie: 5 + 5 + 5 + 5 + 5 = 25
Eva: 10 + 10 + 10 = 30

Rosie: 2 + 2 + 2 + 2 + 2= 10
Eva: 10 + 10 + 10 = 30

Make Arrays

Notes and Guidance

Children begin to make arrays by making equal groups and building them up in columns or rows.

They use a range of concrete and pictorial representations alongside sentence stems to support their understanding.

Children also explore arrays built incorrectly and recognise the importance of columns and rows.

Mathematical Talk

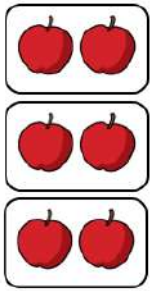
How many equal groups do I have? How many in each group?
Can I represent my apples with counters?

What is the difference between columns and rows?
How many counters in each row? How many counters in each column?

How can I record my array with a number sentence?

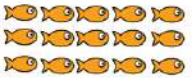
Varied Fluency

- Build an array with counters to represent the apples.
Complete the sentences.



There are ____ apples in each row.
There are ____ rows.
____ + ____ + ____ = ____
There are ____ apples altogether.

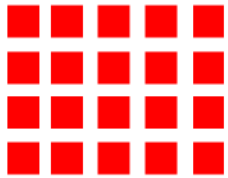
- Complete the table.

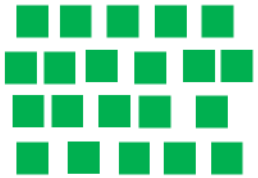
Array	Description - columns	Description - rows	Totals
	5 columns 2 cookies in each column	2 rows 5 cookies in each row	2 + 2 + 2 + 2 + 2 = 10 5 + 5 = 10
	___ columns ___ donuts in each column	___ rows ___ donuts in each row	
	___ columns ___ fish in each column	___ rows ___ fish in each row	
	3 columns 5 cupcakes in each column	5 rows 3 cupcakes in each row	

Make Arrays

Reasoning and Problem Solving

Amir and Whitney are making arrays.

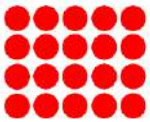


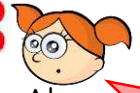


Who has made a mistake? Explain why.

Possible answer: Whitney has made a mistake because her array is not in columns. There are an unequal amount of squares in each row.

Teddy and Alex are writing number sentences to describe the array.





Who do you agree with? Explain why.

Possible answer: They are both right. Teddy has counted the columns. Alex has counted the rows.

Eva begins to make an array with 40 counters.
She has finished her first row and her first column.
Complete her array.

Write two different number sentences to describe the finished array.

Possible answer:
Array showing 10 + 10 + 10 + 10 = 40

Or

4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 = 40

Making Doubles

Notes and Guidance

Children explore doubling with numbers up to 20
Reinforce understanding that 'double' is two groups of a number or an amount. Children show and explain what doubling means using concrete and pictorial representations.

They record doubling using the sentence, 'Double ___ is ____' and use repeated addition to represent doubles in the abstract. They look at representations to decide whether that shows doubling or not.

Mathematical Talk

Can you sort these representations in to doubles and not doubles? How do you know they've been doubled?

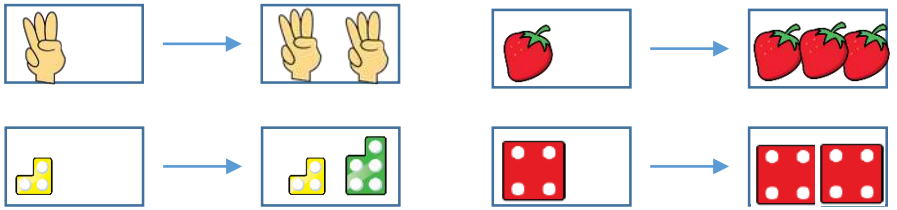
What comes next in my table, why?

How can we show the double differently?

If double 2 is 4, what is double 20?
What is the largest double we can roll on a normal dice?

Varied Fluency

Circle the representations which have been doubled:

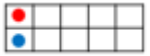
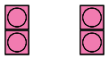


Take a number piece and double it. Complete the sentence.

Double ____ is ____

Double ____ is ____

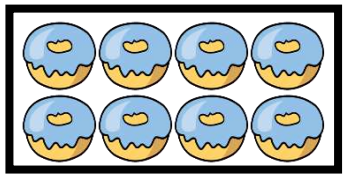
Complete and continue the table.

Build	Represent	Add	Double
		1 + 1 = 2	Double 1 is 2
		2 + 2 = __	Double 2 is __
		3 + 3 = __	Double 3 is __
		__ + __ = __	Double 4 is __

Making Doubles

Reasoning and Problem Solving

Louise doubles her donuts. The picture shows what she had after she doubled her donuts.

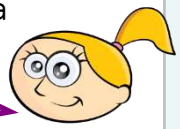


Whitney

Louise started with 4 and ended with 8 donuts.

Eva

Louise started with 8 and ended with 16 donuts.



Mo

Louise started with 2 and ended with 4 donuts.

Who do you agree with? Explain why.

Possible answer:

Whitney is correct because the image shows what she was left with. She had 8 after she doubled and double 4 is 8

Complete the table by doubling each number.

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

What patterns do you notice?

Possible answer:

1	2
2	4
3	6
4	8
5	10
6	12
7	14
8	16
9	18
10	20

The doubles increase by 2 each time.

The doubles are all even.

The doubles end in 2,4,6,8 or 0

Make Equal Groups - Grouping

Notes and Guidance

Children start with a given total and make groups of an equal amount. They record their understanding in sentences, not through formal division at this stage.

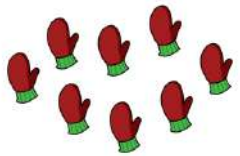
Children can develop their understanding of equal groups by also being exposed to numbers which do not group equally.

Mathematical Talk

How can you tell if the groups are equal? How can you represent the equal groups? Do all numbers divide into equal groups of 2?
How do you sort the cubes into equal groups?
What would happen if there were 21 cubes?
Have I got equal groups?
How do you know?
Does each group need to be arranged in the same way for it to be equal?

Varied Fluency

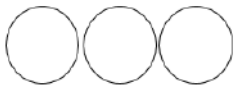
- How many equal groups of 2 can you make with the mittens?



There are ____ groups of 2 mittens.
If you had 10 mittens, how many equal groups of 2 mittens could you make?

- Take 20 cubes. Complete the sentences.
I can make ____ equal groups of 2
I can make ____ equal groups of 5
I can make ____ equal groups of 10

- Complete the table. Use equipment to help you.

Representation	Description
	There are ____ altogether. There are ____ equal groups of ____
	There are ____ altogether. There are ____ equal groups of ____
	15 has been sorted into 3 equal groups of 5
	____ has been sorted into ____ equal groups of ____

Make Equal Groups - Grouping

Reasoning and Problem Solving

Tommy and Jack each have the same number of sweets.

Tommy has 5 equal groups of 2
Jack has 1 equal group.
How many sweets are in Jack's group?

Jack has 10 sweets in his group.

I am thinking of a number between 20 and 30

I can only make equal groups of 5

What must my number be?

What happens when I try to make groups of 2 with it?

What happens when I try to make groups of 10 with it?

Answer: 25
Children can use practical equipment to solve this and discover what happens.
If you make equal groups of 2 with it there will be 1 left over.
If you make equal groups of 10 with it there will be 5 left over.

Sharing Equally

Notes and Guidance

Children explore sharing as a model of division.
They use 1 : 1 correspondence to share concrete objects into equal groups.

Children also need to be given the opportunity to see when a number of objects cannot be shared equally into equal groups.

Mathematical Talk

How can I share the muffins equally?

How many muffins on this plate? How many on this plate? Are they equal? If I had 9 muffins what would happen?

How can I share the objects equally? How many equal groups am I sharing the objects into? Are the groups equal? Are there any left over?

Varied Fluency

- Share the muffins equally between the two plates.
  Complete the sentence.
  ___ cakes shared equally between 2 is ___

- Collect 20 cubes. Use hoops to represent your friends.
  Can you share the cubes between 5 friends?
  20 shared between 5 equals ____
  Can you share the cubes between 2 friends?
  20 shared between 2 equals ____
  Can you share the cubes between 10 friends?
  20 shared between 10 equals ____

- Tim has 16 bananas.
  He shares them equally between two boxes.
  How many bananas are in each box?
  Represent and solve the problem.

Sharing Equally

Reasoning and Problem Solving

Dora has 10 biscuits.

She wants to share them equally at her party.

How many people could be at the party?

Possible answers:

There could be:
10 people
5 people
2 people
1 person (Dora)

There are 10 cakes and 2 boxes.

An equal amount needs to be put into each box.

Jack

Put them into groups of 2

Eva

Share them into 2 groups.

Who is correct?
Explain your answer.

Possible answer:

Eva is correct. She has shared the cakes equally and put 5 into each box.

White Rose Maths

Summer - Block 2

Fractions

Overview

Small Steps

- Find a half (1)
- Find a half (2)
- Find a quarter (1)
- Find a quarter (2)

Notes for 2020/21

You may choose to omit this block of learning in favour of spending more time on basic number. Children will be introduced to the ideas of halves and quarters again in year 2.

Find a Half (1)

Notes and Guidance

Children explore finding a half for the first time using shapes and sets of objects. They will use the vocabulary 'half' and 'whole'. Children will not at this stage use the fractional notation of $\frac{1}{2}$

It is important that they know that a half means 'one of two equal parts' and are able to count them.

Mathematical Talk

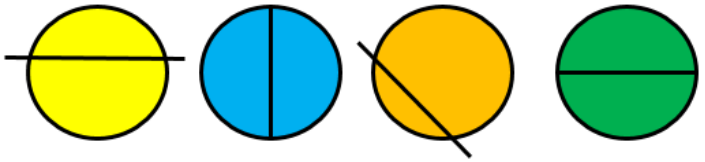
How many parts have I split my object into?
How can you show a half of something?
How do you know if a shape is split into halves?
How many halves make a whole?
Can we count them?
How do you know if an object or shape has not been split in half?
Is there more than one way to show half of a shape or object?
Is this the same for all shapes?

Varied Fluency

- Show the children real life objects and how they can be cut in half.
  How can we cut these objects in half?

  Can any of the objects be cut in half in more than one way?

- Which circles have been split into equal halves?



- Match the halves to make 5 complete shapes.

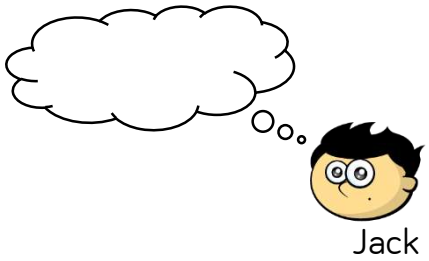
Find a Half (1)

Reasoning and Problem Solving

Eva and Jack are both attempting to split a rectangle in half.

Eva

Jack thinks he can find three more ways.

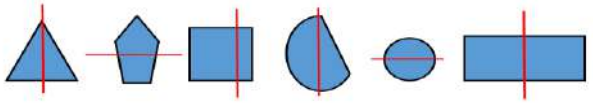


Find Jack's three examples.

Possible answers:

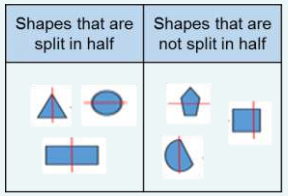
Sort the shapes into the table.

Shapes that are split in half	Shapes that are not split in half



Can you add any more shapes to the table?

Possible answer:



There are a number of different answers for other shapes children could add to the table.

Find a Half (2)

Notes and Guidance

Children use their understanding of finding half of an object or shape and apply this to finding half of a small quantity.
It is important that children find the total amount and can then show how this number can be shared equally into two. The use of concrete manipulatives such as counters can help children to find a half.

Mathematical Talk

How can we find half of an amount?

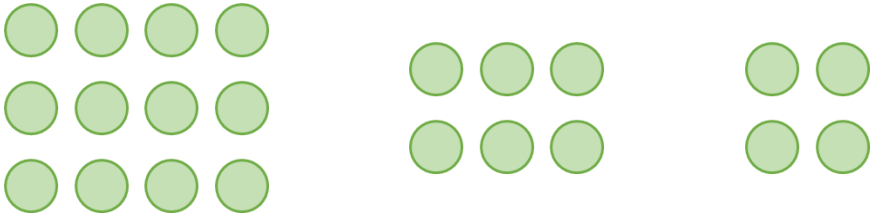
How many groups do we need to share our beads between?

How can you check that you have found half?

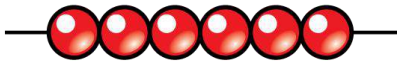
How many equal parts should you have when you have split the objects in half?

Varied Fluency

Find half of each amount.



Find half of the amounts and complete the stem sentences.



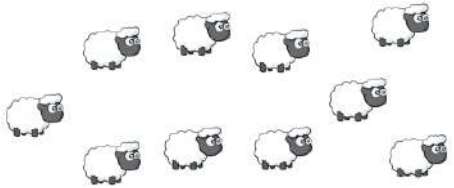
There are ____ beads.

Half of ____ is ____

There are ____ marbles.

Half of ____ is ____

Find half of the sheep.



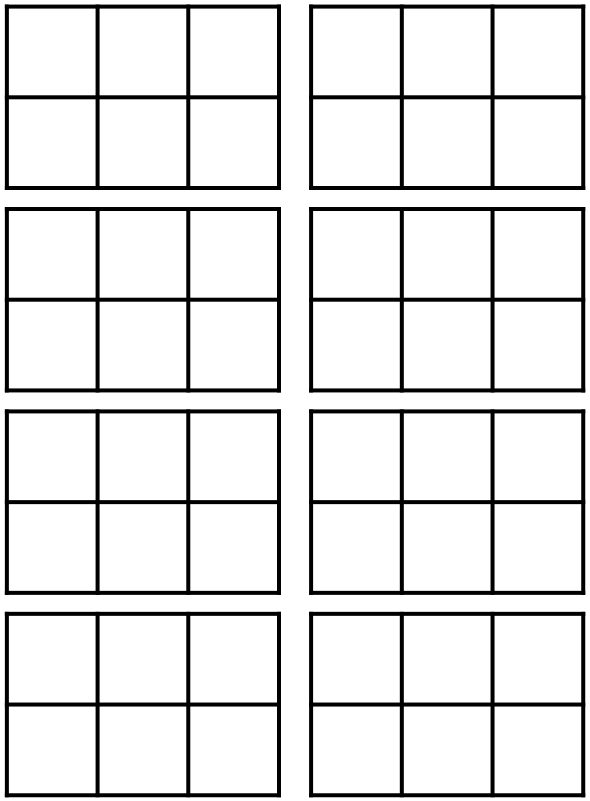
There are ____ sheep.

Half of ____ is ____

Find a Half (2)

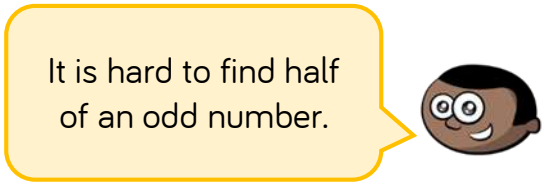
Reasoning and Problem Solving

How many different ways can you shade one half of the shapes?



Any combination that has three whole squares shaded out of the 6

Mo is finding halves.



Do you agree with Mo?
Explain your answer.

Possible answer:
I agree with Mo because an odd number cannot be shared equally between 2
It would not give a whole number answer.

Find a Quarter (1)

Notes and Guidance

Children explore quarters for the first time. They will develop their understanding of equal parts and non-equal parts and relate this to a shape or object being split up into four equal parts.

Children will use the words quarters and parts at this stage but will not use the fractional notation of $\frac{1}{4}$

Mathematical Talk

How many parts does my whole have?
Are my parts equal or not equal?
How many equal parts can we see/count?

Can we make a quarter in a different way?

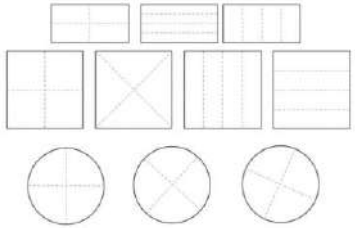
Which shapes show equal parts?
Which shapes show four equal parts?
Which shapes show quarters?

Varied Fluency

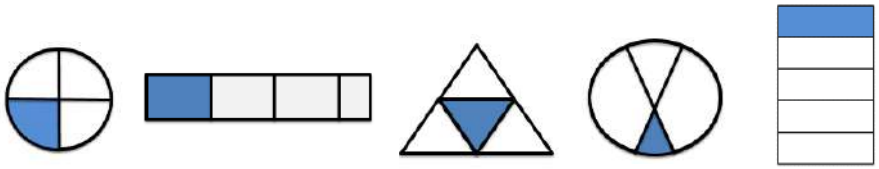
- Take two square pieces of paper, two circular pieces of paper and two rectangular pieces of paper.
  Model folding one of each into four equal parts and the other into four non-equal parts.
  - Which shapes show equal parts? Which do not?
  - How many equal parts can we see?
    Can we fold any of the shapes in a different way and still get equal parts?

  Count the equal parts and then model counting them in quarters.

- Colour a quarter of each shape. Can you colour it in different ways?



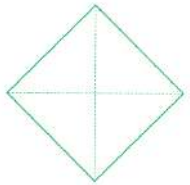
- Tick the shapes that show quarters.



Find a Quarter (1)

Reasoning and Problem Solving

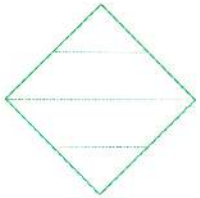
Alex and Jack are talking about quarters.



My shape shows quarters because it has four equal parts.

Alex

My shape shows quarters because it has four parts.



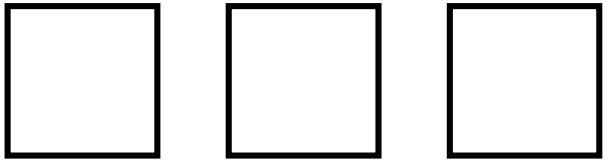
Jack

Are they correct?
Explain your answer.

Alex is correct because quarters must be four equal parts.
Jack has split his square into four unequal parts so they are not quarters.

Use the squares to show:

- Less than a quarter shaded.
- Exactly a quarter shaded.
- More than a quarter shaded.



There are multiple solutions for each one.

Find a Quarter (2)

Notes and Guidance

Children find a quarter of a small quantity through equal sharing. It is important they can show the groups clearly by drawing around quantities or by physically sharing into something. Children will use the word quarters and parts at this stage but will not use the fractional notation of $\frac{1}{4}$

They also begin to describe capacity using the terminology 'a quarter full'.

Mathematical Talk

How many sweets do I have? How can I share them equally into four groups? What is one quarter worth?

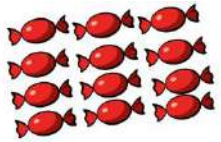
Are my containers the same or different?
Can you should me a quarter full in each container.

How can I quarter this amount?
If I have 2, and it is a quarter, what will the whole look like?
What will the whole be worth?

Varied Fluency

- Share each quantity into four equal groups.

There are ___ cakes.
There is ___ cake in each quarter.
A quarter of ___ is ___



There are ___ sweets.
There are ___ sweets in each quarter.
A quarter of ___ is ___

There are ___ peaches.
There are ___ peaches in each quarter.
A quarter of ___ is ___

- Use a range of containers and rice/water.
Can you show me a quarter full in each container?
Do they look the same or different?

- Use counters to complete the sentences.

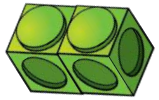
A quarter of 4 is ___ A quarter of 8 is ___

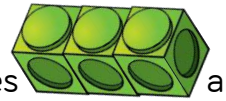
1 is one quarter of ___ 3 is one quarter of ___

Find a Quarter (2)

Reasoning and Problem Solving

One cube  is a quarter, what could the whole look like?

Two cubes  are a quarter, what could the whole look like?

Three cubes  are a quarter, what could the whole look like?

How many different possibilities can you make?

Possible answers:

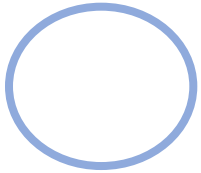
Any arrangement of 4 cubes.

Any arrangement of 8 cubes.

Any arrangement of 12 cubes.

There are many different possibilities which the children will find through their exploration with the multilink.

Mr. White has asked his class to put one quarter of the balls into the hoop.



Teddy: I'm going to put one ball in the hoop.

Whitney: I'm going to put three balls in the hoop.

Tommy: I'm going to put four balls into the hoop.

Who is correct? Can you explain any mistakes made?

Whitney is correct because one quarter of 12 is 3

Teddy has misinterpreted **one** quarter to just mean one.

Tommy knows that quarters are linked to fours but hasn't split the balls into four equal groups.

White Rose Maths

Summer - Block 3

Position & Direction

Overview

Small Steps

- Describe turns
- Describe position (1)
- Describe position (2)

Notes for 2020/21

Practical activities are encouraged to help children understand how to describe position, direction and movement, including whole, half, quarter and three quarter turns.

Consider omitting the language of half and quarter turns if fractions was not covered.

Describe Turns

Notes and Guidance

Children use the language 'full', 'half', 'quarter' and 'three-quarter' to describe turns made by shapes/objects.

Children should practically turn objects, shapes and themselves in different directions but do not need to describe the direction of the turns. Children should investigate whether they can finish facing the same direction if they complete different turns.

Mathematical Talk

What is each turn called?
Is there only one direction shapes/objects can move in?

Does it make a difference which way the shape / object / person is turned?

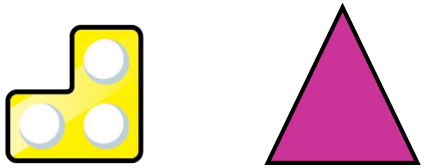
What part of a whole has the shape/object turned?
What will the shape/object look like before or after the turn?

Varied Fluency

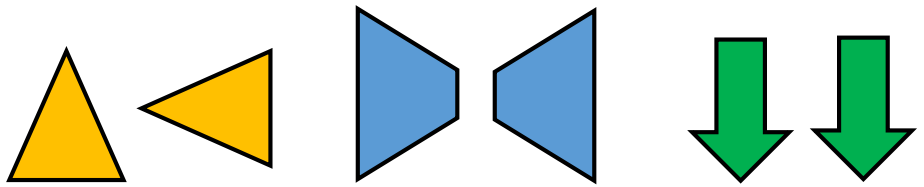
- Give the children instructions using the language 'quarter turn', 'half turn', 'three quarters turn' and 'full turn'. Children could then work in pairs to give and follow directions. This could be developed into a routine with music or as the children line up.

- Draw what each shape will look like once it has turned a:

  - quarter turn
  - half turn
  - three-quarter turn
  - full turn



- Complete the sentence to describe the turns these shapes have made.



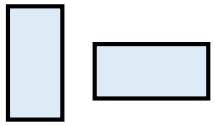
The shape has turned a _____ turn.

Describe Turns

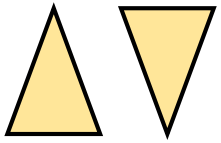
Reasoning and Problem Solving

Are these statements correct?
Is there more than one answer?
Explain how you know.

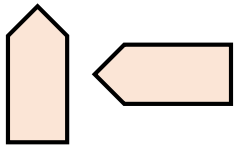
The shape has made a quarter turn.



The shape has made a half turn.



The shape has made a three-quarter turn.

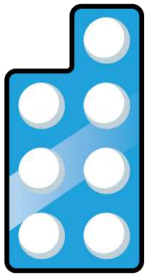


Correct in either direction. It could also be a three-quarter turn in either direction.

Correct in either direction.

The shape could have made a three-quarter turn clockwise or a quarter turn anti-clockwise.

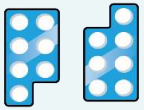
Alex turns her number shape and it finishes facing this direction.



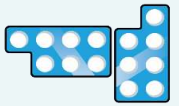
What direction could it have started facing?

What turn could it have made?

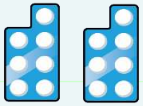
A half turn.



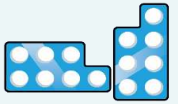
A quarter turn



A whole turn



A quarter turn



A three-quarter turn

A three-quarter turn

Describe Position (1)

Notes and Guidance

Children use 'left', 'right', 'forwards' and 'backwards' to describe position and direction. They will describe the position of objects and shapes from different starting positions.

You could use board games such as Snakes and Ladders and Twister to explore positional language.

Where possible, this concept should be explored practically.

Mathematical Talk

What are the different directions we can move in?

How would I get to the ……..?

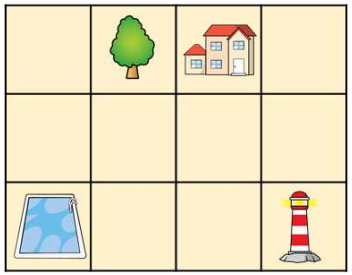
How could you describe the movement?
How could we record the movement?

How would I get from the …… to the ……..?

Varied Fluency

- Use cones to mark out a route for a partner.
Describe the route your partner needs to take using the words 'left', 'right', 'forwards' and 'backwards'.

- Use a grid to move a bot to different places. Use the words 'left', 'right', 'forwards' and 'backwards' to describe the movements.



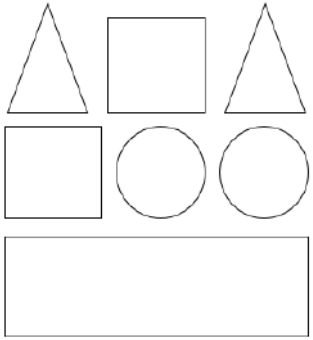
- Complete the sentences using 'left' and 'right' to describe the position of the coins.

The £1 coin is to the _____ of the 1p coin.
The 50p coin is to the _____ of the 1p coin.
The 2p coin is to the _____ of the 50p coin.

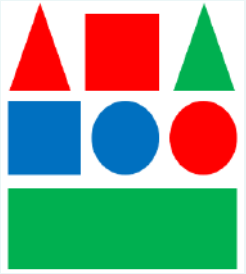
Describe Position (1)

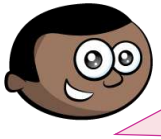
Reasoning and Problem Solving

Use the clues to colour the shapes.



- The circle in the middle is blue.
- The circle on the right is red.
- The shape up from the right circle is green.
- The shape down from the circles is green.
- The square to the left of the green triangle is red.
- The four-sided shape up from the rectangle is blue.
- The triangle on the left is red.

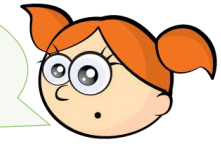




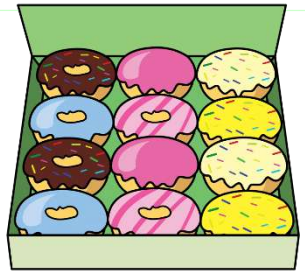
Mo

The pink doughnuts are on the left.

The pink doughnuts are on the right.



Alex



Who is correct?
Explain how you know.

Both children could be correct because they have not stated what the pink doughnuts are left or right in relation to.

The pink doughnuts are on the left of the yellow doughnuts and the pink doughnut are on the right of the blue and brown doughnuts.

Describe Position (2)

Notes and Guidance

Children will build upon directional language 'left' and 'right' to assist with describing position. They will describe position using: 'top', 'in between', 'bottom', 'above' and 'below'. Children explore the position of objects and shapes from different starting points.

Where possible, this concept should be explored practically both in and out of the classroom.

Mathematical Talk

Where is the _____ in relation to you?

What is _____ of you?

What is _____ of this object?

How can we describe the position of _____?

Can you create your own instructions to build a tower?

Varied Fluency

Think about where you are sitting in the classroom.
What can you see around you? Complete the table.

In front of me	Behind me	To the left of me	To the right of me

Use objects in your classroom or outside area to complete the sentences. Use the words: 'top', 'middle', 'bottom', 'above' and 'below' to describe the position.

The _____ is above _____.
The _____ is below _____.
In between _____ and _____ is _____.
Above _____ is _____ and _____.
There is nothing between _____ and _____.

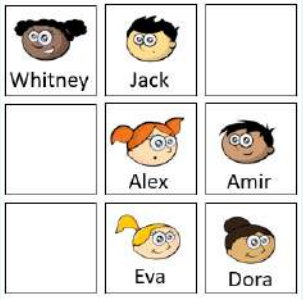
Use 5 cubes to build a tower.

- Start with a yellow cube.
- Place a blue cube on top of the yellow cube.
- Place a white cube below the yellow cube.
- Place a red cube on the top of the tower.
- Place the green cube in between the yellow and white cube.

Describe Position (2)

Reasoning and Problem Solving

Whitney	Jack	
		Dora



Jack is directly above Alex.
Eva is directly below Alex.
_____ is to the right of Eva.
There is no-one above Amir.
What are the missing names?
Add people to complete the grid and describe where they are.

How many different ways can you describe the position of the 2p coin?

Possible answers may include:

The 2p coin is:

Below the 50p

Above the 10p

In between the £1 and 5p

To the **left** of the 5p

To the **right** of the £1

White Rose Maths

Summer - Block 4

Place Value (within 100)

Overview

Small Steps

- Counting forwards and backwards within 100
- Partitioning numbers
- Comparing numbers (1)
- Comparing numbers (2)
- Ordering numbers
- One more, one less

Notes for 2020/21

Children continue their learning on place value. Start with numbers within 10, 20 and 50 to ensure understanding of this before moving on to look at numbers within 100.

Counting to 100

Notes and Guidance

Children build on their previous learning of numbers to 50 They continue grouping in 10s to make counting quicker and more efficient.

Children are introduced to the hundred square and use it to count forwards and backwards within 100

Using dot-to-dot activities, both forwards and backwards, with a range of numbers is a fun way to explore counting to 100

Mathematical Talk

What is the most efficient way to count the objects?

How many are in each group?

How many more groups would you need to make 100?

What do you notice about the layout of the hundred square?

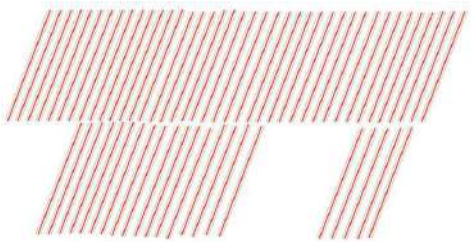
Can you tell you friend an efficient way to find the number 57?

Will I count the number ___ if I am counting from ____ to ____?

Varied Fluency

- How many flowers are there altogether?
  Can you represent the flowers using ten frames and counters?

- How many straws are there?
  Bundle the straws into tens to make them easier to count.



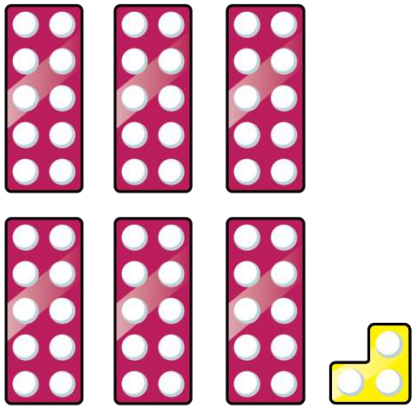
- Use the hundred square to:
  - Count forwards from 80 to 92
  - Count backwards from 73 to 65
  - Write down the numbers between 75 and 81
  - Find what number comes between 46 and 48

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
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

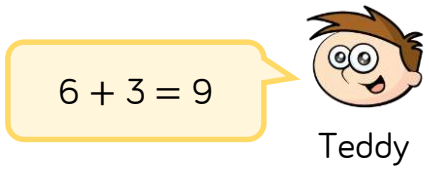
Counting to 100

Reasoning and Problem Solving

Teddy has made a number using the number shapes.



He says



What mistake has Teddy made?

Teddy has counted the six 10s as 1s and added it to the 3

Correct the mistake in each sequence.

- 34, 35, 36, 38, 39
- 98, 97, 96, 95, 93
- 78, 79, 18, 81, 82

- 34, 35, 36, 37, 38, 39
- 98, 97, 96, 95, 94, 93
- 78, 79, 80, 81, 82

Partitioning Numbers

Notes and Guidance

Children continue grouping in 10s to identify how many tens and ones are within a number. Flexible partitioning is not expected at this stage, however children may notice other ways of partitioning numbers by themselves. Children will use concrete resources to group objects into tens and ones. Place value charts can be introduced to read and record tens and ones within a number.

Mathematical Talk

Can you make groups? How many could we put in each group?

What happens when we have 10 ones?

How many groups of 10 are there?

How many ones are there?

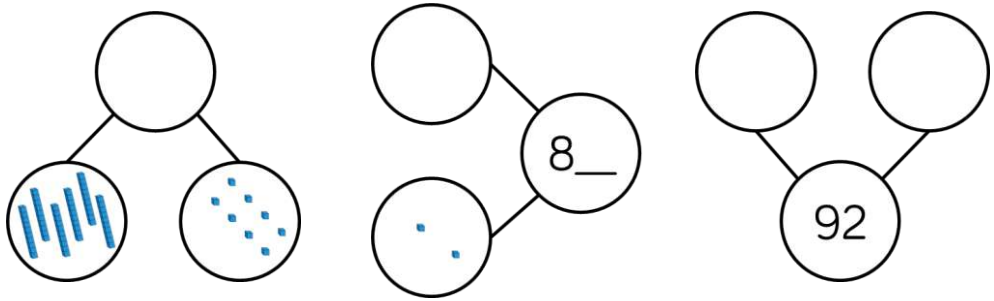
Varied Fluency

- Use Base 10 to make these numbers. Complete the stem sentences.

70 36 64 81 22 66 49

70 has 7 tens and 0 ones.

- Complete the part-whole models.



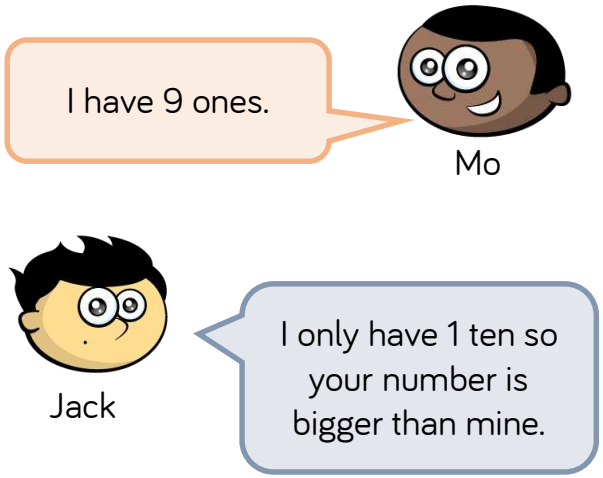
- Show these numbers using a place value chart, Base 10 or straws.

Tens	Ones

73 50 88 79
91 85 62 93

Partitioning Numbers

Reasoning and Problem Solving



Is Jack correct?
Prove it.

Jack is incorrect.

Jack's ten is equal to ten ones.

Mo only has 9 ones.

Use Base 10 to make a number:

- Greater than 84
- Less than 70
- Greater than 75 but less than 87

Children may make a range of numbers to fit the given criteria. Ensure children are not mixing up the tens and ones.

Use Base 10 to make a number.

The number has 5 tens and fewer than 8 ones

How many possible numbers are there?

They could make 50, 51, 52, 53, 54, 55, 56 or 57
So there are eight possibilities.

Comparing Numbers (1)

Notes and Guidance

Children use their partitioning knowledge to begin comparing numbers within 100

It is important for children to work with a range of equipment, both natural and man-made to make comparisons more visual.

Children use the language 'more than', 'less than' and 'equal to' alongside the inequality symbols.

Mathematical Talk

Which number has the most/fewest tens? Which number has the most/fewest ones?

Why is it important to look at the tens before the ones?

If the number is greater/less which direction will we move on the number line?

How can we count efficiently?

Varied Fluency

- Use Base 10 to make these numbers on place value charts. Write how many tens and ones are in each number.

78 and 61

Tens	Ones

90 and 89

Tens	Ones

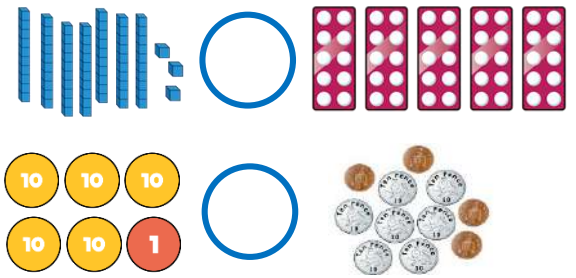
64 and 92

Tens	Ones

Which number from each pair is the largest? Discuss how you know.

- On the hundred square, find a number:
  - Less than 69
  - Greater than 79
  - Greater than 69 but less than 79

- Use equipment from your classroom to compare the amounts using >, < or =

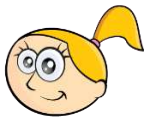


Comparing Numbers (1)

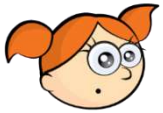
Reasoning and Problem Solving

Eva and Alex have some number cards.

1 2 4



Eva



Alex

3 5 6

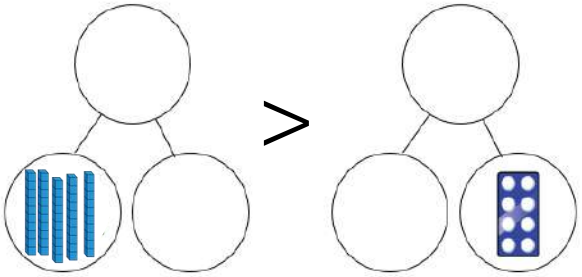
They both use two of their cards to make two-digit numbers.

Eva's number is bigger than Alex's number.

What could their numbers be? How many answers can you find?

Eva could have 41, or 42 and Alex could have 35 or 36.

How many ways can you complete the part-whole models to make the calculation correct?



Children can choose a range of numbers to complete the part-whole models, but need to ensure the first model is greater than the second..
Possible answers include:
50 > 8
51 > 48 etc.

Comparing Numbers (2)

Notes and Guidance

Children compare numbers and amounts using comparison language, more than, less than, equal to as well as the symbols $<$, $>$ and $=$

Children demonstrate their understanding of the value of the digits in a 2-digit number. They represent this using concrete manipulatives before ordering numbers. Children should be aware when comparing three or more numbers opposite inequality symbols should not be used. (e.g. $\square < \square > \square$)

Mathematical Talk

Which number is the biggest/smallest? How do you know?

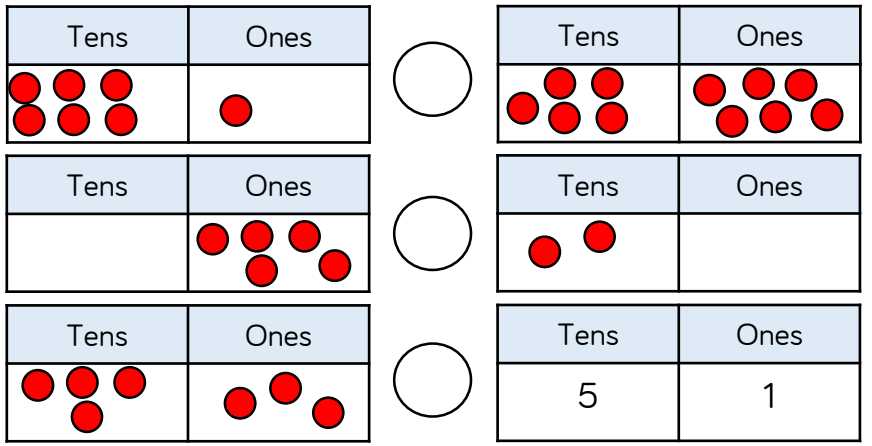
When ordering, which digit should you consider first?

Is there more than one number that could complete the statement?

What is the largest/smallest number that could complete the statement?

Varied Fluency

Compare the amounts using $<$, $>$ or $=$



Complete the statements:

$70 < \square$ $\quad \square > 70$ $\quad \square < 70$

$\square < 1$ $\quad 0 < \square$ $\quad \square < 100$

Complete the stem sentences and statements.

62 is _____ than 55 but _____ than 70

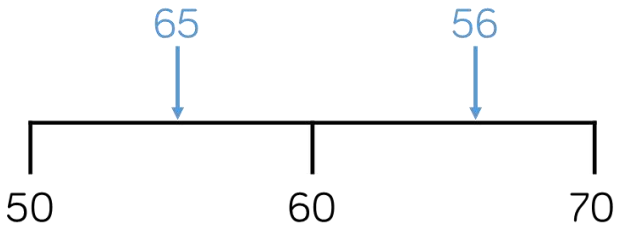
$\square < \square < \square$ $\quad \square > \square > \square$

___ is greater than ____ but less than ____

Comparing Numbers (2)

Reasoning and Problem Solving

Tommy has marked numbers on his number lines.
Has he made any mistakes?



Explain to a friend the mistake you think he has made.

Show the numbers on your own number line.

- 75
- 34
- 91
- 57

65 is greater than 60 and therefore should come after 60 on the number line.

56 is less than 60 so should come before it on the number line.

Tommy could have read the tens and ones digit the wrong way around or mixed up the 2 numbers.

How many different ways can you complete the place value charts to make the statement correct?

Tens	Ones
5	

<

Tens	Ones
	3

$50 < 53$
$51 < 53$
$52 < 53$

Placing a 6, 7, 8 or 9 in the tens column means that children can then place any number in the ones column.

Ordering Numbers

Notes and Guidance

Children order sets of objects and numbers from smallest to largest and largest to smallest.

Children use the language 'most', 'bigger', 'biggest', 'larger', 'largest', 'smaller', 'smallest' and 'least'.
Children revisit and practise position and ordinal numbers (first, second, third etc.)

Mathematical Talk

How are we ordering these objects/numbers? Which should we start with?

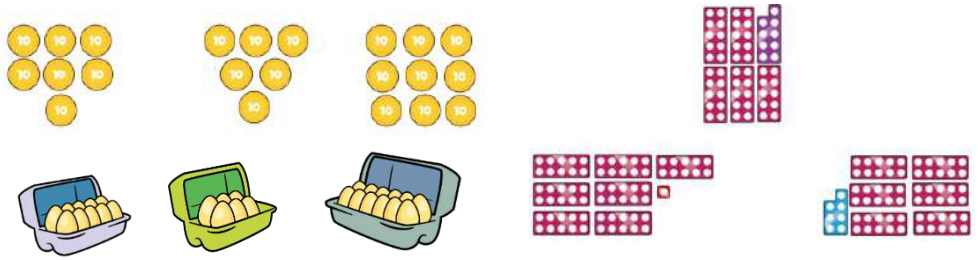
Which is the biggest/has the most?
Which is the smallest/has the least?
Which number/group comes next? How do you know?

How many more/less objects are in group A than group B?

Varied Fluency

- Put these objects in the correct place in the table.

	Most		Least
Counters			
Number Pieces			
Eggs			



- In groups of 4 roll some PE equipment. The furthest roll wins. Give a sticker and a high-five to the person who came first, second, third and fourth.

- Order the numbers from smallest to largest.

57 8 21

100 93 72

Ordering Numbers

Reasoning and Problem Solving

Mo creates a traffic jam using some toy cars on the carpet.
The red car is 3rd from the front.
It is also the 2nd from the back.

Use some cars or manipulatives to find out how many cars are in the traffic jam.

There are four cars in the traffic jam.

The numbers in each list are in size order.
Complete the missing numbers.

65	78		91	99

89	80	72		

		57		

Why did you choose the numbers you did?
Are they the only numbers that could have completed the number tracks?

Children could choose any number > 78 but < 91

Children could choose any numbers < 72

Children can choose any numbers to make the track go from largest to smallest or smallest to largest.

One More, One Less

Notes and Guidance

Children find one more and one less than given numbers or amounts to 100

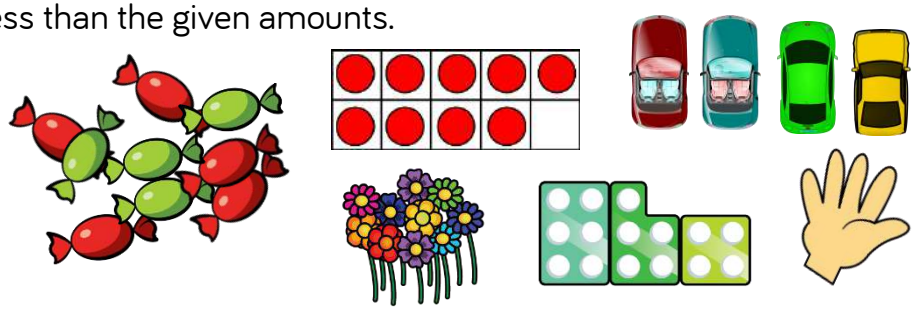
Children use concrete materials and physically add 1 more or take 1 away before moving to more abstract methods such as number tracks or hundred squares.

Mathematical Talk

Do we need to add more or take some away?
How can we represent this?
How many tens were there? How many tens are there now?
How many ones were there? How many ones are there now?
Which place value column changes when finding 1 more and 1 less?
What happens when I find 1 more than a number with 9 ones?
What happens when I find 1 less than a number with 1 one?

Varied Fluency

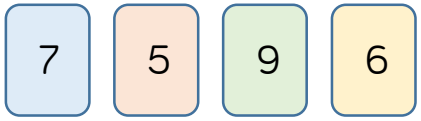
- Use manipulatives and ask children to show one more and one less than the given amounts.



- Complete the missing numbers.

		37			
	46	47			
55		57			
65					

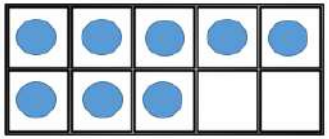
- Use the number cards to make 2 digit numbers.
Now write down one more and one less than the numbers you have made.
Use equipment if needed.



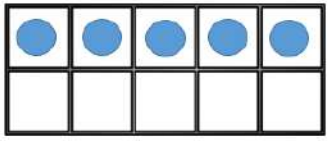
One More, One Less

Reasoning and Problem Solving

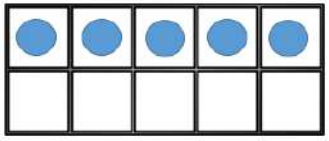
Can you move two of the counters so Rosie has 1 more than Alex and Whitney has 1 less than Alex?



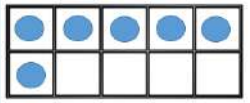
Alex



Rosie



Whitney



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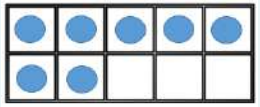

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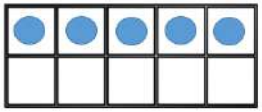


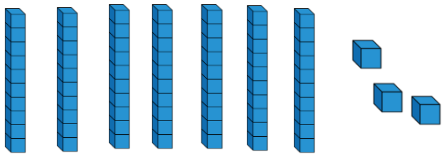
W

Always, Sometimes or Never True?

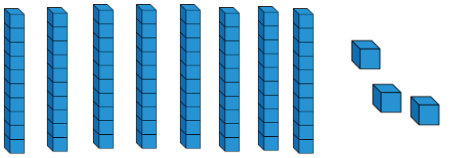
When finding 1 less than a number, the tens digit of the number stays the same.

Sometimes.
If the number has 0 ones, the tens digit will change.

Dora started with this number.



I am going to find one more.



Has Dora shown the correct amount?
Explain how you know.

Dora is not correct.
Dora has shown 10 more by adding another rod instead of 1 more and adding another cube.

White Rose Maths

Summer - Block 5

Money

Overview

Small Steps

- Recognising coins
- Recognising notes
- Counting in coins

Notes for 2020/21

When counting in coins, focus on 1p, 2p, 5p and 10p coins to build on understanding of counting in 1s, 2s, 5s and 10s from earlier in the year.

Recognising Coins

Notes and Guidance

Children will recognise and know the value of different denominations of coins.
Children will use their knowledge of place value to match coins with equivalent values. For example, ten 1 pence coins is equivalent to one 10 pence coin. This could be linked with the concept of exchanging.
Teachers could use coins to support this activity (or pictures where appropriate).

Mathematical Talk

How have you organised the coins?

What is the value of each coin? How do you know?

How many 1 pence coins will you need to make 2 p? 5 p? 10 p? 20 p? 50 p? 1 pound?

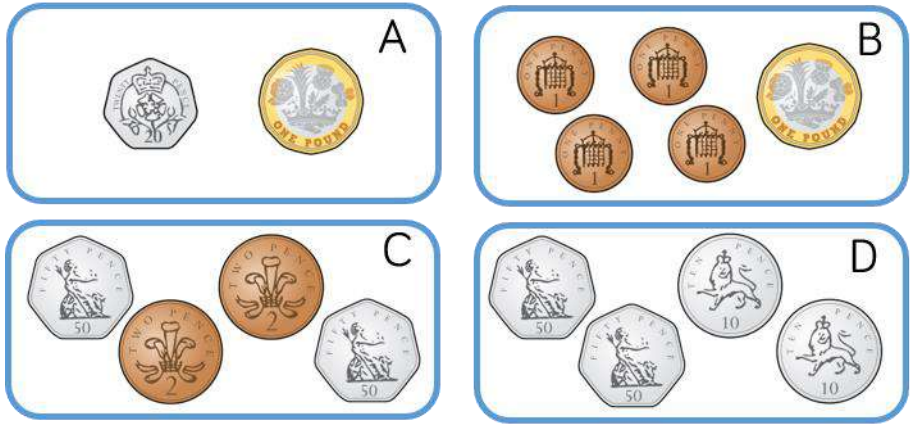
How many 1 pound coins will you need to make 2 pounds?

Varied Fluency

- Organise the coins on your table into pence and pounds.
Can you name each coin?

- Write down the value of each coin.

- What coins are in each box?



Recognising Coins

Reasoning and Problem Solving

Dora says:

Do you agree with Dora?

Justify your answer.

Dora is incorrect.

A 50 p coin isn't round.
A 20 p coin isn't round.
A £1 coin isn't round.

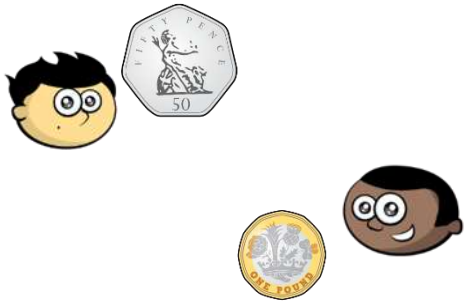
Which is the odd one out?

20 p | 8 p | 2 p | 10 p

Why?

8 p is the odd one out because we do not have an 8 p coin.

The tooth fairy left some money for two children.



Jack has 50 pence. Mo has one pound.

Jack thinks he has more money because his coin is physically bigger.

Explain why Jack is wrong.

Jack is wrong because although the 50 pence coin is physically bigger it only has a value of 50 pence, but the pound coin has a value of 100 pence.

Recognising Notes

Notes and Guidance

Once children are able to identify and recognise coins they need to be able to recognise notes.

Children use their understanding of place value to see that one note can represent many pounds, for example, a ten pound note could be 10 pound coins or 3 two pound coins and 4 one pound coins. Children also need to be aware that one note may be worth many times the value of another note.

Mathematical Talk

Can you name each note?

What is the same about each note?

What is different about each note?

How many ___ pound notes are equivalent to a ___ pound note?

Varied Fluency

How many of each note can you see?

There are _____ 5 pound notes.
There are _____ 10 pound notes.
There are _____ 20 pound notes.

What is the value of each note?

 = ☐ pounds

 = ☐ pounds

 = ☐ pounds

Fill in the blanks.

One  = ☐ 

One  = ☐ 

Recognising Notes

Reasoning and Problem Solving

Teddy is given one  for Christmas.

Eva is given two  

I got more than you did because my number is bigger.

Teddy

I got more than you did because I got two notes.

Eva

Who is correct?

Explain your reasoning.

Both Teddy and Eva are wrong because they both have £10.

Eva has two £5 notes, which makes £10, and Teddy has a £10 note.

Jack, Rosie and Amir each have some money in their pockets.
Jack and Amir both have coins and Rosie has a note.

I have more money than Rosie.

Amir 

I have less money than Rosie.

Jack

What note could Rosie have?

Rosie could have a £5 note.
She could not have a £10 or a £20 note because they are larger than Amir's amount.

Always, sometimes, never

Money in notes is worth more than money in coins.

Sometimes - if you have £6 in coins it is worth more than a £5 note.
However you could also have less than £5 in coins.

Counting in Coins

Notes and Guidance

Children combine their knowledge of money with counting in 2s, 5s and 10s to count money efficiently.

They may draw coins or representations to match a given amount and use previous understanding to compare amounts of money.

Mathematical Talk

Can two people have the same amount of money, with a different number of coins?

Is the largest amount of coins always the largest amount of money? Can you prove it?

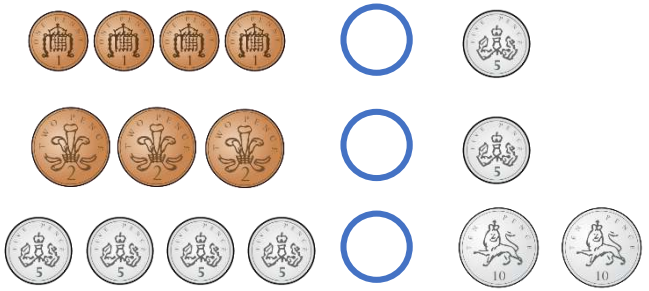
Is there one way, or more than one way?

Varied Fluency

- Using coins children make links to times tables. What do they notice?

- Use or draw coins to show the given amounts.
  - 10p in 5p coins.
  - 50p in 5p coins.
  - 50p in 10p coins.
  - 40p in 5p coins.

- Use <, > or = to compare the amounts.



Counting in Coins

Reasoning and Problem Solving

Tommy's piggy bank is full of 2 pence pieces, 5 pence pieces and 10 pence pieces.

Using one type of coin at a time, how can he make 30 p?

Fifteen 2 pence pieces equal 30 p.

Six 5 pence pieces equal 30 p.

Three 10 pence pieces equals 30 p.

Alex has 2 silver coins.

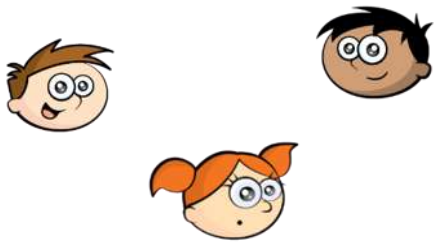
Teddy has 5 bronze coins.

Amir has 1 silver coin.

They all have the same amount of money.

Which coins do they each have?

Collect or draw the coins to prove it.



Are there any other amounts that this works for?

Alex has two 5 pence coins.

Teddy has five 2 pence coins.

Amir has one 10 pence coin.

They all have 10 p.

You could have two 10 pence coins making 20 pence and one 20 pence coin but there are not 5 bronze coins which make 20 pence.

White Rose Maths

Summer - Block 6

Time

Overview

Small Steps

- Before and after
- Dates
- Time to the hour
- Time to the half hour
- Writing time
- Comparing time

Notes for 2020/21

You may choose to omit these steps to focus on some of the earlier learning on place value and addition and subtraction. Time will be revisited in Year 2 or could be taught through short daily inputs throughout the year.

Before and After

Notes and Guidance

Children are introduced to key vocabulary related to time.

They use before and after to describe, sort and order events.

Building on this, they use first and next to describe an order of events. When talking about the day, children use the language: morning, afternoon and evening.

Mathematical Talk

Explain why you have placed the pictures before or after each other?

Could any of the pictures have gone in both?

Which activities do you do before school?

Which activities do you do after school?

What do you do in the morning?

What do you do in the afternoon?

What do you do in the evening?

Varied Fluency

Sort the activities into **before** and **after** school.


Breakfast


Bedtime story


Get dressed


Go to a party

Can you think of one more activity for each group?
Can you sort the activities into three groups labelled **morning**, **afternoon** and **evening**?

Tommy is drinking a bottle of orange juice.
Match the words to the bottles to order them.

finally | first | next

Describe a special day to a friend. Use the words: before, after, first, next, morning, afternoon, evening.

Before and After

Reasoning and Problem Solving

Dora is describing her day.

Dora

First, I went to the park. After lunch, I went to the cinema. Before the cinema, I went to a café for lunch.

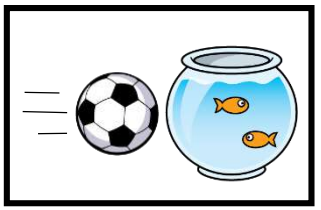
Can you draw and label pictures to order Dora's day?

First | Next | Then

Children draw a picture so the 'First' box shows the park, the 'Next' box shows lunch and the 'Then' box shows cinema.

Draw pictures to show what could have happened before and after.

Before



After

Children draw pictures to show what could have happened.
They might show someone kicking the ball in the 'Before' box and the goldfish bowl smashing in the 'After' box.

Dates

Notes and Guidance

Children learn about the days of the week and know there are 7 days in a week. They talk about events using today, yesterday and tomorrow.

Children learn about the months of the year and can pick out special dates within the year, for example, their birthday.

Children could explore and use a calendar displaying days and months within the classroom environment.

Mathematical Talk

What day is it today?

What day was it yesterday?

What day will it be tomorrow?

Which month is your birthday in?

Which month do we start school in?

Which months are the summer holidays in?

If today is _____ , what will tomorrow be?

Varied Fluency

Fill in the missing days of the week and complete the sentences.

Sunday
Tuesday
Wednesday
Saturday

- Today is Wednesday, yesterday was _____.
- Yesterday was Monday, today is _____.
- Today is Saturday, tomorrow is _____.
- Tomorrow is _____, today is Wednesday.

Use a calendar to look at the names of the months.
Discuss special dates in different children's lives e.g. birthdays, celebrations, holidays.
Complete the sentences.

My birthday is in _____.

In _____, I went to _____.

Dates

Reasoning and Problem Solving

Eva is practising chanting the months of the year.

She says,

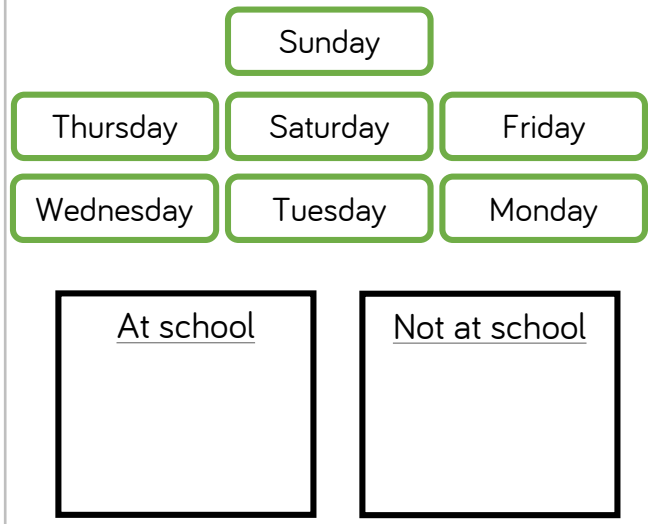
Eva is incorrect. Correct her mistakes.

January
February
March
April
May
June
July
August
September
October
November
December

The 5h June is a Wednesday.
What day is the 10th June?

The 10th June is a Monday.

Sort the days of the week into school days or non-school days.



School days – Monday, Tuesday, Wednesday, Thursday, Friday

Non-school days – Saturday, Sunday

Time to the Hour

Notes and Guidance

Children are introduced to telling the time to the hour using an analogue clock. They learn the language of o'clock and understand the hour hand is the shorter hand and the minute hand is the longer hand.
Children read the time to the hour and know when the minute hand is pointing upwards to the number 12 it is an o'clock time, and understand that they need to look at the hour hand to see which hour it is.

Mathematical Talk

There are two hands on the clock.
What is the same about each hand? What is different about each hand compared to the other?

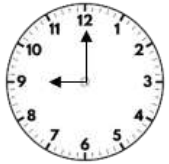
Looking at all three clock faces, what is the same about the hands? What is different about them?

Where will the hour hand be at ____?
Where will the minute hand be at ____?
Can you show me _____?

Varied Fluency

- Match the times to the clocks.

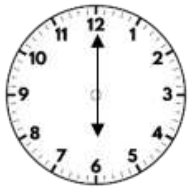
9 o'clock



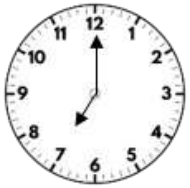
Two o'clock

5 o'clock

- Complete the times.



The time is ___ o'clock



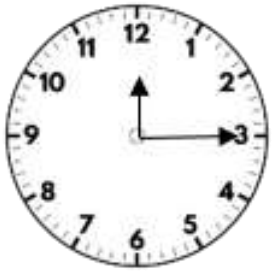
The time is ___ o'clock

- Draw the hour hand and minute hand on clock faces to show the times:

Eight o'clock 1 o'clock Twelve o'clock

Time to the Hour

Reasoning and Problem Solving

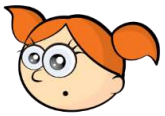


Amir

The time is 3 o'clock.

Can you spot Amir's mistake?

Amir has read the hour hand and the minute hand the wrong way round. At three o'clock the longer minute hand should be pointing at 12 and the shorter hour hand should be pointing at 3



Alex

When it is 11 o'clock both hands point at 11

Is Alex correct?
Explain your reasoning.

Alex is incorrect. If the time is eleven o'clock, the hour hand should be pointing at 11 and the minute hand should be pointing at 12

Time to the Half Hour

Notes and Guidance

Children are introduced to telling the time to the half hour. They learn the language half past.

They understand that, at half past the hour, the minute hand has travelled half way around the clock from the twelve and is pointing at the six and the hour hand is half way between the hours e.g. half way between one and two or half way between nine and ten.

Mathematical Talk

Which is the hour hand? Which is the minute hand? How do you know?

Where does the minute hand point to at half past? Can you see that the minute hand has travelled halfway around the clock? Could you show this to your partner?

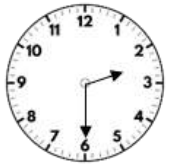
Can you show me _____?

Varied Fluency

- Match the times to the clocks.

Half past twelve

Half past 2



Half past nine

- Complete the times.

The time is half past ___

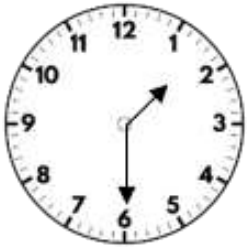
The time is half past ___

- Draw the hour hand and the minute hand on clock faces to show these times:

Half past 1 Half past four Half past 8

Time to the Half Hour

Reasoning and Problem Solving



The time is 6 past 1

Tommy

Can you spot Tommy's mistake?

Tommy has read the minute hand as showing the number of minutes past the hour, rather than understanding that the minute hand pointing to 6 means half past. The time is half past one.

Read the instructions and draw the hands on the clock.

- The minute hand is pointing at the six.
- The hour hand is half way between 10 and 11

What time is it?

The time is half past 10

Writing Time

Notes and Guidance

Children explore the difference between seconds, minutes and hours. They decide which activities would be measured in each unit of time.
Children explore suitable equipment e.g. stopwatches or sand timers to measure durations of time. They carry out activities and use suitable equipment to measure how long each activity takes e.g. timing how long it takes to run around the playground using a stopwatch.

Mathematical Talk

Would you measure the activity in hours, minutes or seconds?

How many star jumps do you think you can do in 10 seconds?

Let's count to 20 seconds in our heads, stand up when you think we reach 20 seconds. How close were you?

Varied Fluency

Using a stopwatch, record how many times you can do these activities in 20 seconds.

- Star jumps
- Write your name
- Hops on the spot

Can you think of any activity which takes 20 seconds?

Would you measure the duration of the activities in seconds, minutes or hours? Sort the activities into three groups: seconds, minutes and hours.

Brushing teeth	Reading a book	Saying the alphabet
Holiday flight	Playing outside	Sleeping at night

Complete the sentences using seconds, minutes or hours.

- Playtime is about 20 _____ long.
- The school day is about 6 _____ long.

Writing Time

Reasoning and Problem Solving

Are the units of time chosen sensible for these activities?

- A football match measured in seconds.
- A lap around the school playground measured in minutes.
- A birthday party measured in hours.

Explain your answers.

Not sensible- a football match is measured in minutes because to use seconds would involve very large numbers.

Dependent on the school playground, could be sensible, or it could be more sensible to measure in seconds.

Sensible - parties can last at least 2 hours.

Dora has a clock without an hour hand.

She says,

Do you agree with Dora?
Explain your answer.

I agree, Dora can still measure time in minutes using her clock.
The minute hand moving the distance from one increment to another shows one minute has passed.
The minute hand moving one complete turn shows that one hour has passed.

Comparing Time

Notes and Guidance

Children compare amounts of time using the language faster, slower, earlier and later.
They build on writing and measuring time by comparing different amounts of times using time language.
Children understand that when someone wins a race the length of time will be shorter and if someone takes longer the length of time will be larger.

Mathematical Talk

Which is longer: one hour, one minute or one second?

If I finish a race first, am I faster or slower than everyone else?

Can you think of a comparison where you use faster and slower in the same sentence?
e.g. A rabbit is faster than a tortoise but slower than a cheetah.

Varied Fluency

Teddy, Mo and Whitney are running a race. Here are their times.

 Teddy - 52 seconds

 Mo - 58 seconds

 Whitney - 48 seconds

Use **faster** or **slower** to complete each sentence.

Teddy is _____ than Mo.

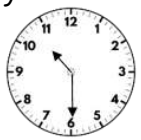
Teddy is _____ than Whitney.

Whitney is _____ than Mo.

Can you write any more sentences to describe the race using the words slower and faster?

Three planes are flying to Paris in the morning.
Here are the times they arrive.

A 

B 

C 

Use **earlier** and **later** to complete the sentences.

Plane A is _____ than Plane B.

Plane B is _____ than Plane C.

Plane C is _____ than Plane A.

Complete the sentences using <, > or =

1 minute ◯ 1 hour 30 seconds ◯ 3 hours

2 seconds ◯ 1 minute

Comparing Time

Reasoning and Problem Solving

Work in small groups.
Complete the following activities and record how long it takes each person.

- Build a tower of ten bricks.
- Run a lap of the playground.
- Write your name five times.

Write three sentences about each activity using the words **slower** and **faster.**

Children will complete three sentences about each activity. They can then share the sentences with their groups and see how many different sentences they have created with altogether.

Five friends are going to a party.
Use the clues to work out when each friend arrived.

Amir arrived later than Jack and Eva.
Rosie arrived later than Amir but earlier than Ron.
Eva arrived the earliest.

1st
2nd
3rd
4th
5th

1st - Eva
2nd- Jack
3rd- Amir
4th- Rosie
5th- Ron