

White

**Rose
Maths**

Autumn - Block 1

Place Value

Overview

Small Steps

NC Objectives

- 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

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

Count, read and write numbers to 10 in numerals and words.

Given a number, identify one more or one less.

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

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?

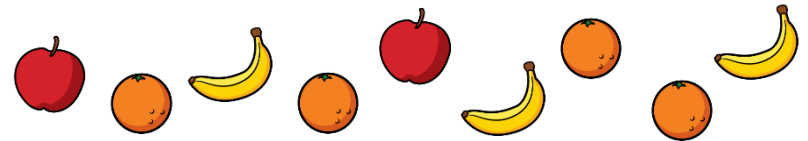
How have you grouped the objects?

How do you think these objects have been grouped?

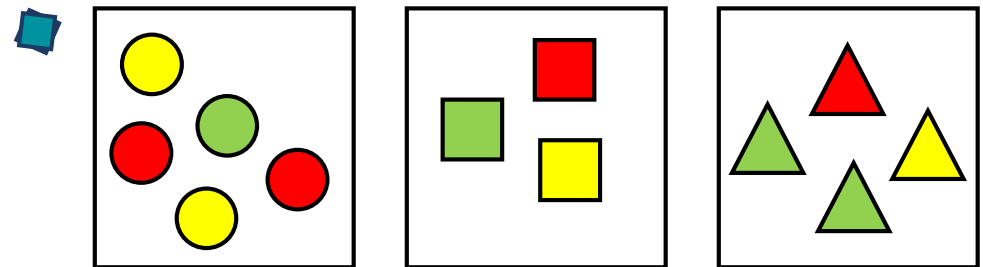
Can there be more than 2 groups?

Varied Fluency

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



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

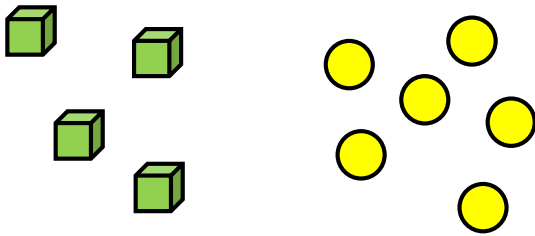


How have these objects been grouped?
How else could you group them?

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.



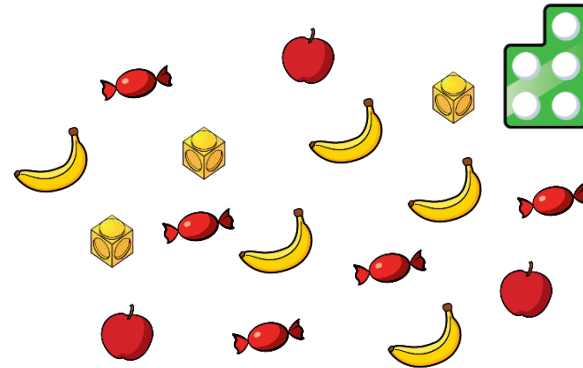
Jack

These objects have been sorted into green and yellow.

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?

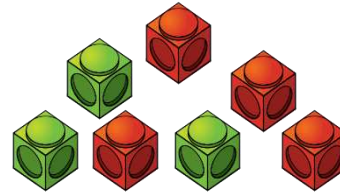
When would we count 0?

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?

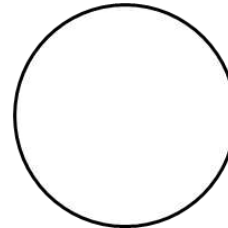


There are _____ red cubes.

There are _____ green cubes.

There are _____ cubes altogether.

Match the numbers to the correct amount of teddies.



3

1

0

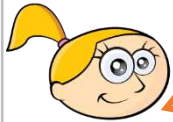
Group the items, and then count how many there are in each group. Compare your groups with a partner's.



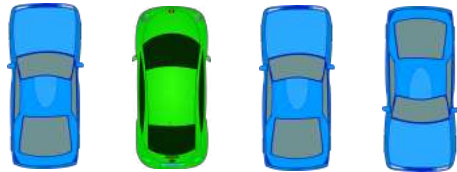
Count Objects

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.

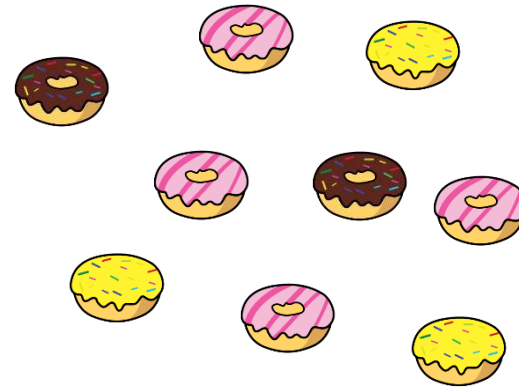


How could Eva have grouped the cars?

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?

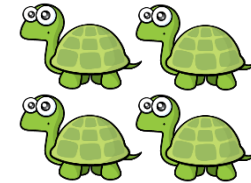
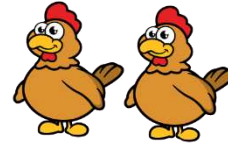
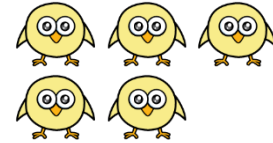
Can you show me fewer than 4 sweets?
How many ways can you do this?

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

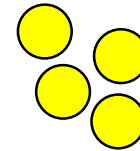
Children could line up 6 counters/cubes.

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)

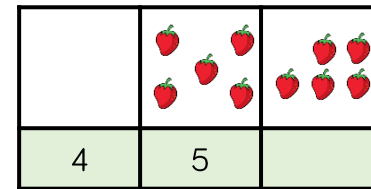
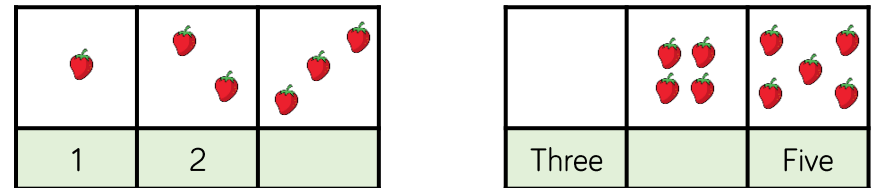
Are the numbers getting greater or smaller?

What is the next number?

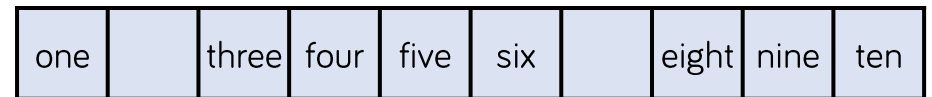
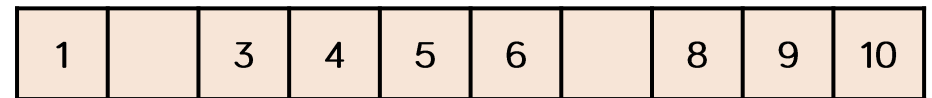
Can you use the resources or images to help you count?

Varied Fluency

Complete the number tracks.



Complete the number tracks.



Fill in the missing numbers.

___, 1, 2, 3

3, 4, ___, 6

1, ___, 3, ___

six, ___, ___, nine

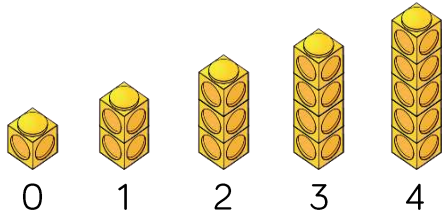
Count Forwards

Reasoning and Problem Solving

Spot the mistakes, and correct the sequences.

- 0, 2, 3, 4, 5

-



- 1 



- 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?

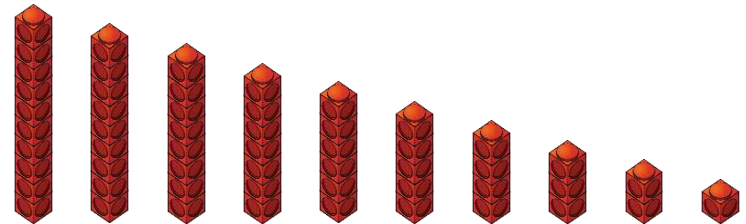
Are the numbers getting greater or smaller?

What comes before ___?

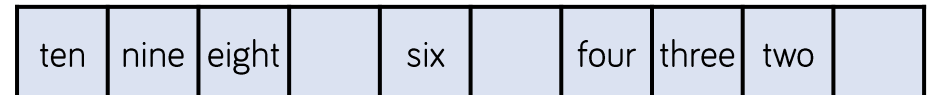
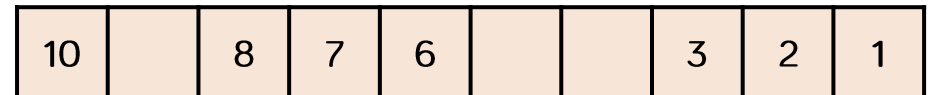
Can you use the manipulatives and images to help you count?

Varied Fluency

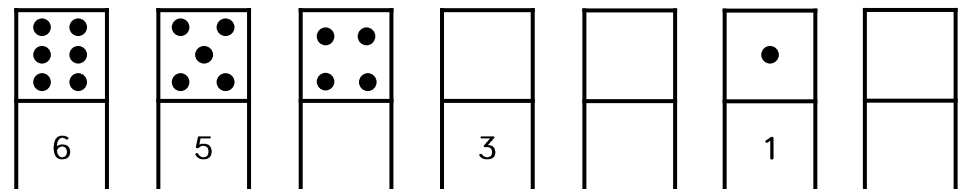
- Write the numerals to match the cubes.
Can you describe the pattern?



- Complete the number tracks.



- Fill in the empty boxes.



Count Backwards

Reasoning and Problem Solving

Alex is counting.



9, 8, 7, 6, 5

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 _____

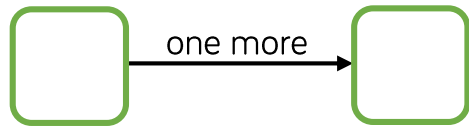
- Choose a number card from 0 to 9 then complete the table.

Number in numerals	Number in words	Number track
		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
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										
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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?

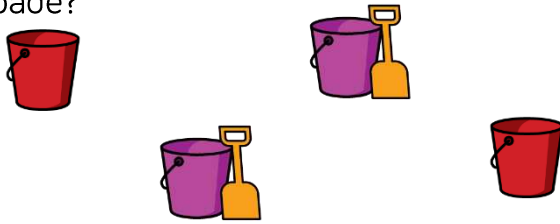


If not, how many more caps are needed?

One-to-One Correspondence

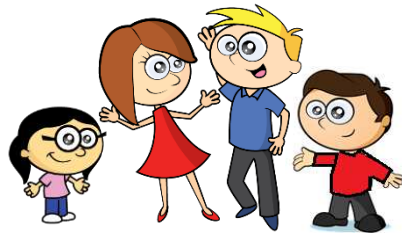
Reasoning and Problem Solving

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



If not, why not?

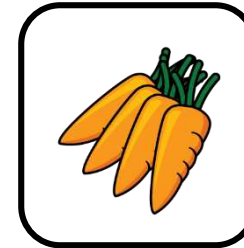
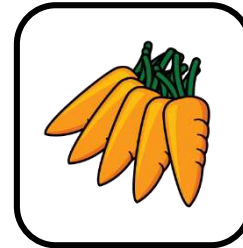
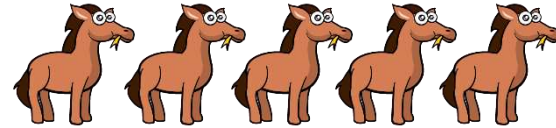
No, there are enough buckets for one each but not enough spades.



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?

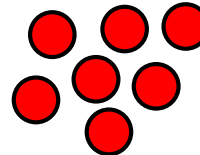
What does 'is equal to' mean?

Varied Fluency

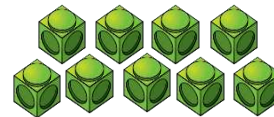
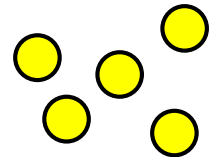
Circle the picture with more trees.



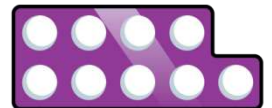
Use **greater than**, **less than** or **equal to**, to complete the sentences.



is _____



is _____

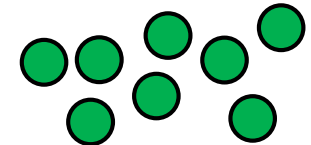


Draw counters in the box to represent the sentence.

Eva's counters

Tommy's counters

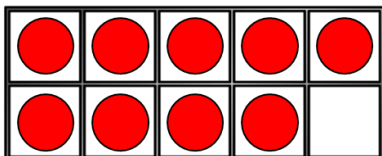
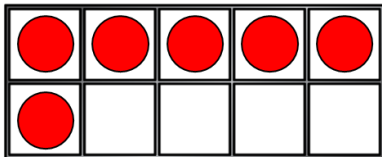
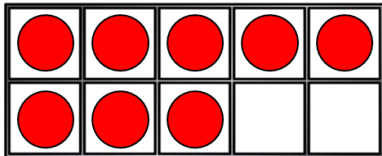
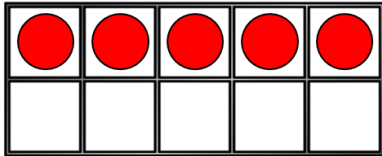
Eva has fewer
counters than
Tommy.



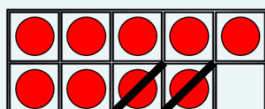
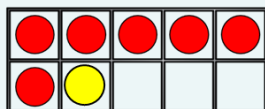
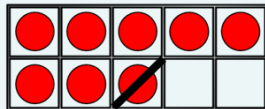
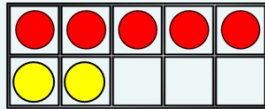
Compare Objects

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:

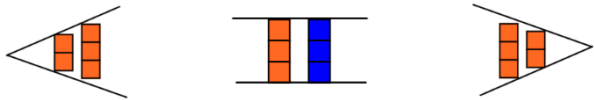
- 4 cubes
- 3 cubes
- 2 cubes
- 1 cube
- 0 cubes.

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'?

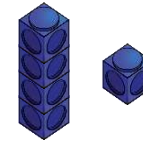
Is _____ greater than, less than or equal to _____?

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.



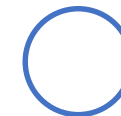
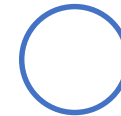
Use cubes to show that,

$$3 < 4$$

$$6 > 2$$

$$5 = 5$$

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



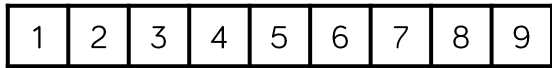
Seven

Introduce $<$, $>$ and $=$

Reasoning and Problem Solving

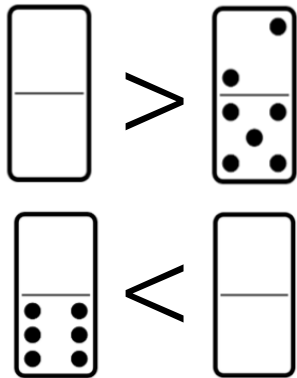
Circle all the numbers from the track that **cannot** go in the box. Explain why.

$$6 < \square$$



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

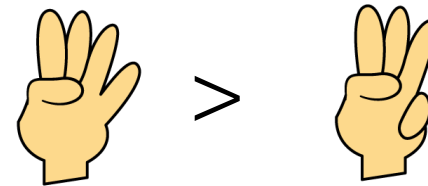
Complete the blank dominoes.



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 _____?

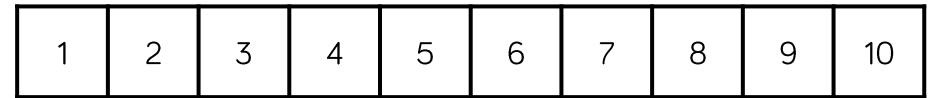
How can you describe these two numbers?

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?



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.

$$8 > 4$$

$$7 < 10$$

$$3 > 6$$

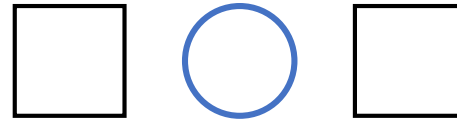
$3 > 6$ is incorrect.

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,



I can just compare the first two to work out the answer.

Do you agree? Explain why.

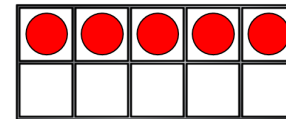
No, she needs to know how many spots are on the third ladybird to correctly place them all.

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

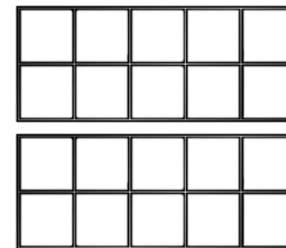
Who has the least amount of sunflowers?

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

Greatest



Smallest



Jack has the least amount of sunflowers.

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?

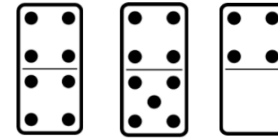
Which is/has the smallest? How do you know?

How are you going to order the amounts?

How have these objects/numbers been ordered? How do you know?

Varied Fluency

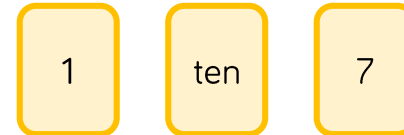
- Order the dominoes from smallest to greatest.



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:

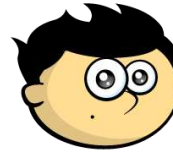
7, 2, 1

6, 3, 1

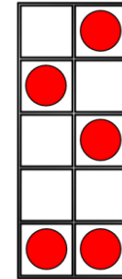
5, 3, 2

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?

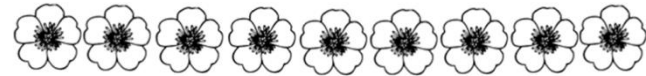
Is there always a 4th? Why?

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 ○ △ □ □

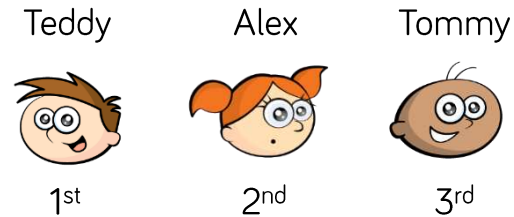
Dora ○ □ △ □

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:



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

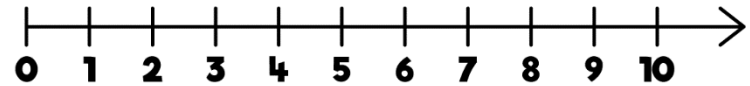
Using a number line gives children the opportunity to count from zero.

Mathematical Talk

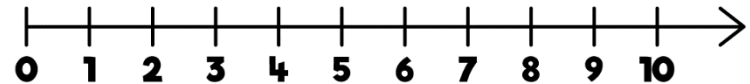
- Can you label the number line?
- How do you know where to put the numbers?
- How are numbers presented on a number line?
- What does each mark on the number line represent?
- Where does the number line start?
- How did you choose where to put them?
- Where does the number line end?
- Do we have to 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?

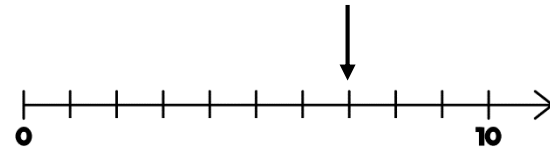
Which numbers could they be?

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

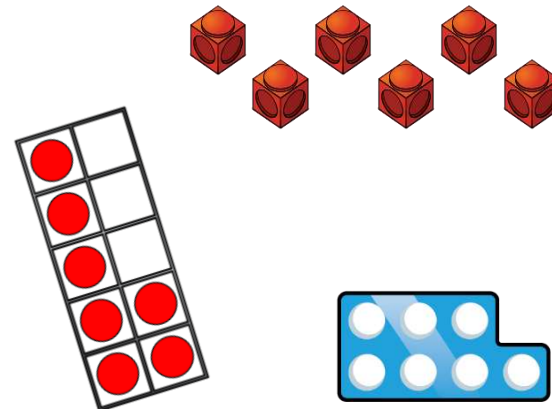
3 or 9 depending which way they jumped.

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.