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

NC Objectives

Count to <u>twenty</u>, forwards and backwards, beginning with 0 or 1, from any given number.

Count, read and write numbers to <u>20</u> 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.

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 _____?
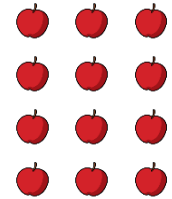
Varied Fluency

Match the representations to the correct numeral.
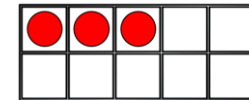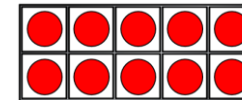
12   7   10

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

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,

I am going to count to 20

I will start at 8

Will Mr Monaghan say 11?

Explain how you know.

Yes because 11 is between 8 and 20

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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 _____?
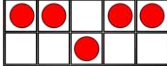
What number has been made using the equipment? How did you find out?

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

Reasoning and Problem Solving

Teddy says,

I can make all the numbers from eleven to twenty using the digits 1 – 9

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.

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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 _____

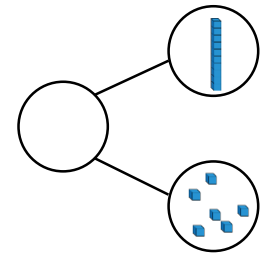One part is _____, the other part is _____
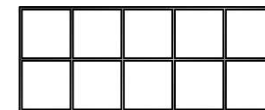
The whole is _____
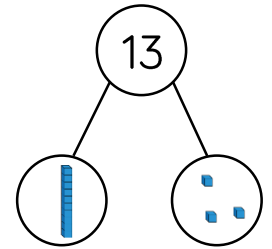
My number is _____

It has _____ tens and _____ ones.

The whole is _____

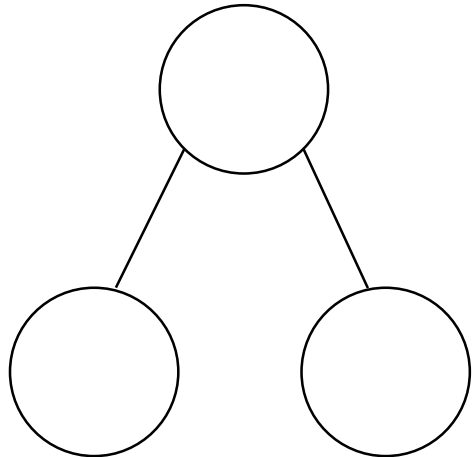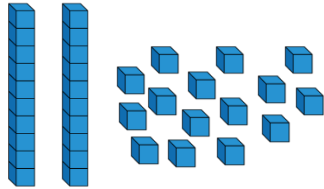Fill in the ten frames with counters to show 14 and complete the sentence.
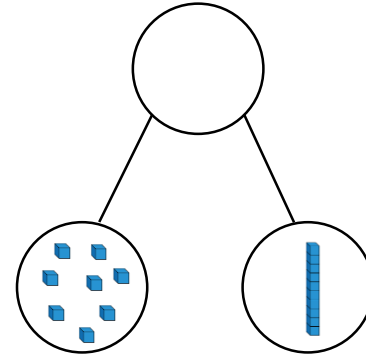
14 has _____ ten and _____ ones.

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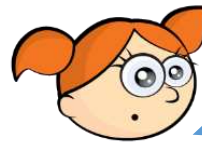
Open ended e.g. 1 ten and 5 ones make 15

Alex makes a part-whole model.

She says:

There are 8 tens and 1 one.

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?
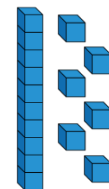
How would we find one less?

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

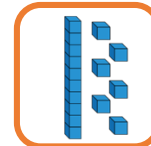■ Make one more and one less than these numbers.

■ Draw to complete.

One less   One more

13

■ Draw to complete.

One less   One more

11

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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?
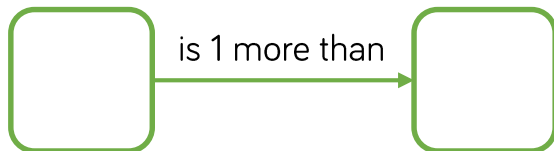
[   ] is 1 more than [   ]

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 _____?
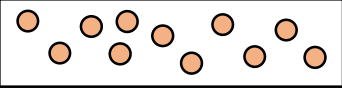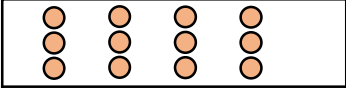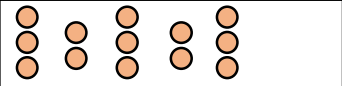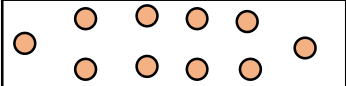Could you use the inequality symbols to compare the numbers?
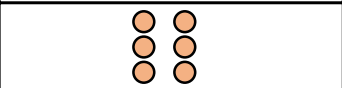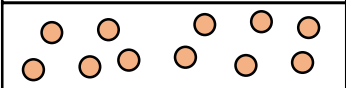
Varied Fluency

◼ Which is greater?

A

B

By how many?

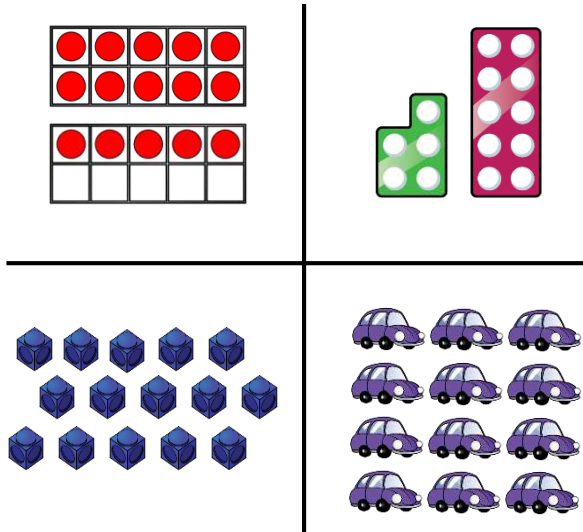◼ Use 'less than', 'greater than', or 'equal to' to complete the sentences.

is _____

is _____

is _____

◼ 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.
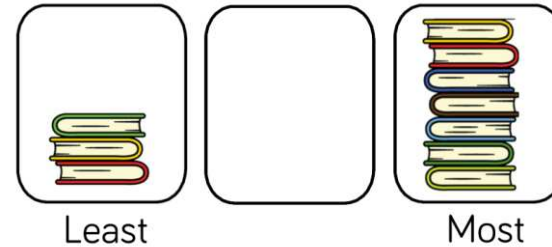
13

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?

Least   Most

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

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?

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?

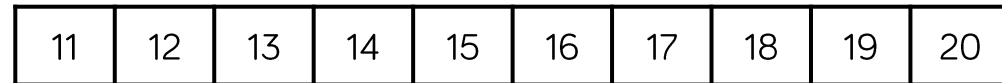Which number is the smallest? How do you know?

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.

| 13 | | | | 17 | |

| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

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?

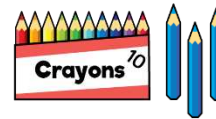Can you think of an amount less than the smallest group?

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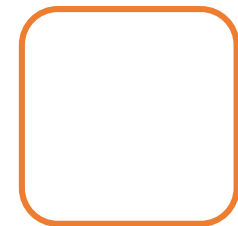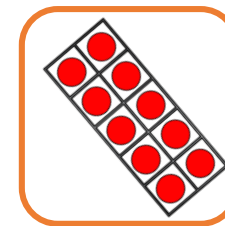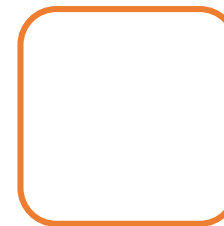
Use cubes to make these numbers and then order them from greatest to smallest.

19   3   14

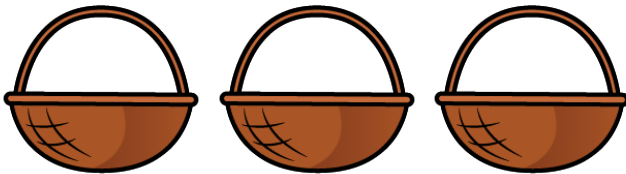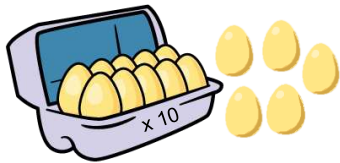Draw counters in each box to make the increasing pattern correct.

Smallest ————————————→ Greatest

Order Groups of Objects

Reasoning and Problem Solving

All of the eggs are placed into baskets.

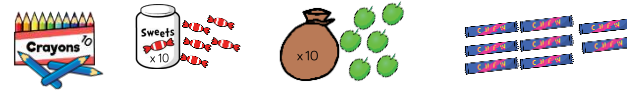How many different ways can you make it correct?

x 10

Greatest   Least

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

Alex orders the groups of objects from smallest to greatest.

Crayons

Sweets x 10

x 10

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.

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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.

<div align="center">13 18 15</div>

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
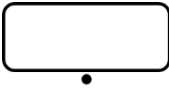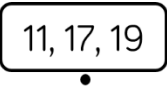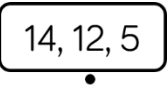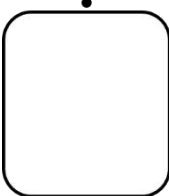
Order the numbers from greatest to smallest:

- 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.

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

| | 11, 17, 19 | 14, 12, 5 |

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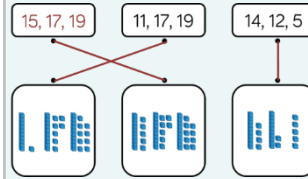
5, 11, 12, 14, 15, 17, 17, 19, 19

Mr Monaghan says,

My number is greater than 8 but less than 15

What could his number be?

Possible answers:

9, 10, 11, 12, 13 or 14