Planning Overview
Year 1 Place Value beyond 20

Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens
Given a number, identify one more and 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
Read and write numbers from 1 to 20 in numerals and words.

1NPV–1 Count within 100, forwards and backwards, starting with any number
1NPV–2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =
1NF–2 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers.

Please note that this is the third of three Place Value units following on from Place Value within 10 and Place Value within 20.

	Teaching and Learning
Count in ones forwards and backwards to 100 and beyond	Regular practise of this skill is needed throughout the year. Count with and without visual representations • Hundred square • Gattegno chart • Number line • Numdrum Children need to recognise the patterns within the count e.g. make links between 1, 2, 3 and 41, 42, 43 and 10, 20, 30. (These connections will not all be easily grasped by just counting but will be drawn out by the activities in the sections below.) They will need extra practise counting backwards over multiples of 10. What happens to the ones digit when we cross a multiple of 10? How do we know which tens digit comes next? Could children fill in each previous number on a number line with multiples of 10 marked? You will need to assess this orally 1:1 during and at the end of the year. e.g. Can children count forwards from 80 to 110 and count backwards from 105?
Skip counting in multiples of 10	Use familiar representations of 10 such as fingers, bundles of straws or numicon tens to support simple skip counting in multiples of 10 forwards and backwards. Dual count alongside images by saying 1 ten, 2 tens, 3 tens as well as 10, 20, 30

Count sets of 10 cubes or bundles of 10 straws and record answer on a place value grid.

T	O
3	0

What does the 3 represent?
What does the 0 represent?

Ensure children are confident that the 3 represents 3 groups of 10.

Count pictures of objects where items are grouped into tens and record answers in a similar way.

Use a bead string and count each set of 10 and put a labelled peg between each multiple of 10.

Challenge children to identify which multiple of 10 comes before or after a given multiple shown on the bead string.

Look at the multiples of 10 on a 100 square. Cover some up. Can children identify which they are? Cover all except one multiple of 10. Which multiple of 10 will be in the square above, the square below?

Extend to look at sequences of multiples of 10 forwards and backwards.

20, 30, _, 50, _
50, 40, _, 20, _

Spot the mistake 10, 20, 40, 50,

Mastery

Look at the grid. Choose a number and complete the second grid.

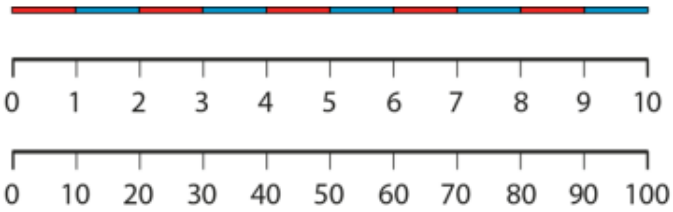
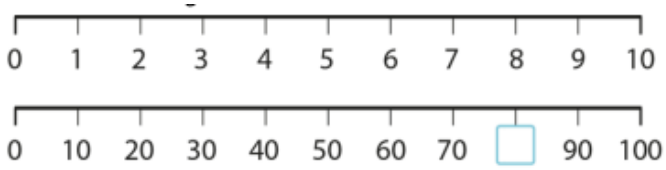
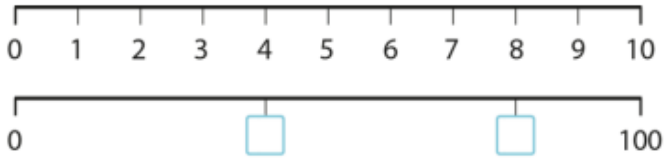
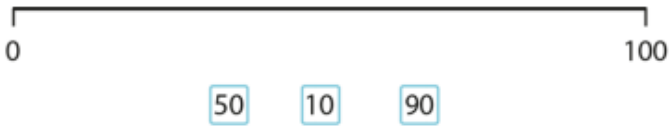
		50	
Count in 1s	49	50	51
Count in 10s	40	50	60

		?	
Count in 1s			
Count in 10s			

(Count in ones part could be also attempted now or left until after work on composition of 2-digit numbers)

Solve problems using counting in tens e.g.
I have 3 goes at bowling and knock all the pins down each time. How many points do I get?

If eggs are packed in boxes of 10 and I need 50 eggs, how many boxes should I buy?

Understand that a 0-10 number line can be used to estimate the position of multiples of 10 on a 0-100 number line	Use a bead string or dienes 10 sticks end to end above a 0-10 number line to count the groups of ten. Then introduce a 0-100 number line with multiples of 10 marked beneath that. What's the same? What's different?  With 0-10 number line as a scaffold above ask children to place multiples of 10 in the correct place on the 0-100 number line. Ensure they are making the link between the two number lines – not just counting in tens.   Remove the 0-10 number line scaffold and see if children can still roughly position the multiples of 10 in the correct place. E.g. do they know 50 goes in the middle? *'Estimate where each of the numbers lie on the number line.'*  *'Which multiple of ten is this?'*  (Number line images taken from NCETM – professional development materials)

<table>
<tr>
<td>Count objects efficiently by making groups of 10

Understand that the position of a digit tells you the value</td>
<td>Count a large set of objects e.g. 42 in ones and get muddled up and have to keep starting again.
Show how it is easier to organise them into groups of 10 and then if you go wrong you don't have to start right back at the beginning. Could use tens frames to organise the groups of ten.

Repeat process with pictures – circling groups of ten

<table><tr><th>T</th><th>O</th></tr><tr><td>7</td><td>3</td></tr></table>

Progress to writing it on a standard PV grid and then just as a 2-digit number asking questions like: What does the 7 represent? What does the 3 represent? Which digit do we write first? Why?

How many dots are there in this diagram?

How could you count them efficiently?</td>
</tr>
<tr>
<td>Show 2-digit numbers using different representations</td>
<td>Represent 2-digit numbers using different resources.
First those where you can still see that the tens are equivalent to ten ones e.g. straws, multilink cubes, then those where the tens are pre-grouped e.g. dienes.

Children to read a number and build it with resources. Children to be given a set of resources and count the tens then the ones to work out which number is represented.

Move onto pictorial representations of the same resources. Don't always put the tens on the left – vary the presentation.

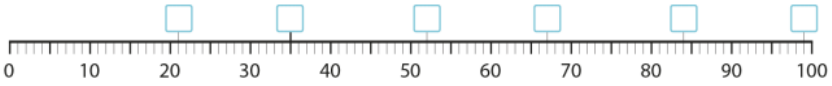
Children begin to record 2-digit numbers with drawings of dienes using a line for a ten and small circles for ones.

Remind them of part-whole models. Can they represent 2-digit numbers by partitioning into tens and ones?

'Throw' a 2-digit number with your fingers to another child. They say what number it is, then choose to throw a different number to someone else.</td>
</tr>
</table>

<table>
<tr><td>Position 2-digit numbers on a number line</td><td>An important representation of 2-digit numbers is the number line. Children need to begin to grasp that a twenties number (i.e. it has 2 in the tens column) will always be positioned between 20 and 30 on the numberline.

They should be able to identifiy the numbers below by counting forwards or backwards from the nearest multiple of ten rather than counting from 0 every time.

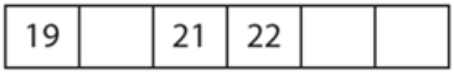
Some children may be able to reason about numbers on a number line e.g. Draw an arrow that points to a number where the ones digit is greater than the tens digit.

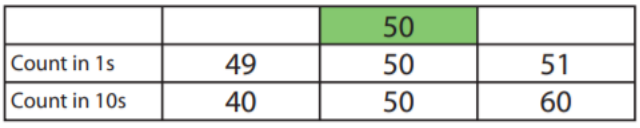
Draw an arrow that points to a number where the digits add up to ten.

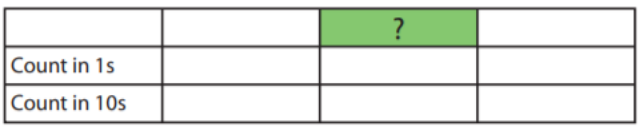
Draw an arrow that points to a number where the tens digit and ones digit are the same.</td></tr>
<tr><td>One more and one less</td><td>Revisit counting forwards and backwards to 100 paying special attention to the tricky boundaries.

Extend to make sure they can give the number that is 1 more and 1 less for any number to 100

Children to complete missing number tracks.

Mastery
Complete:
 

Mastery
Look at the grid. Choose a number and complete the second grid.
 

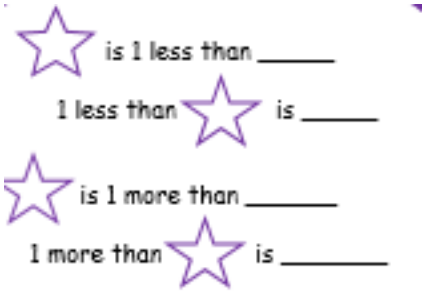
 
</td></tr>
</table>

Mastery

Write 25 in the correct place on the number grid.

8	9	10	11	12	13
14	15	16	17		

Phrase questions in a variety of ways to ensure children understand the language of more than and less than.



Extract from F4M fluency grids

Mastery

Write the missing number in each box.

19 → is **1** less than → ☐

33 → is **1** less than → ☐

54 → is **1** less than → ☐

59 → is **1** less than → ☐

Mastery with Greater Depth

Complete:

☐ → is **1** less than → ☐

☐ → is **1** more than → ☐

Sarah thought of a number – one more than her number was 40, what was her number?

<table>
<tr>
<td>Ten more and ten less</td>
<td>
Recap finding the next and previous multiple of 10. Link this to 10 more and 10 less from a start number that is a multiple of 10.

Using practical apparatus such as dienes, investigate the effect of adding 10 to other 2-digit numbers. Which digit changes?

Put a counter on a 100 square and count on 10 spaces. What do you notice? Repeat until pattern emerges.

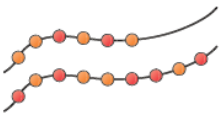
Mastery
Write the numbers missing from these sequences.
<table>
<tr><td></td></tr>
<tr><td>11</td><td></td><td>13</td><td>14</td><td>15</td></tr>
<tr><td></td></tr>
<tr><td>33</td></tr>
<tr><td>43</td></tr>
</table>

Mastery with Greater Depth
Gemma thought of a number. Ten more than her number was 67.
What was her number?

Gemma thought of a number. Ten less than her number was 71.
What was her number?
</td>
</tr>
<tr>
<td>Compare and order amounts and numbers</td>
<td>
Look at representations of two 2-digit numbers first and compare saying which has more than, fewer than, less than. the same amount as.

Extend to representations of more than two 2-digit numbers. Order them and use the terms most and fewest/least.

Move onto comparing numbers rather than representations. Can children explain how they know that 31 is bigger than 28 for example. Can they generalise that you always check which has the bigger tens digit first, if they are the same you have to check the ones.

Mastery
Compare amounts.
What's the same? What's different?
Children compare the bead strings and notice:
One has 9 beads and the other has 6 beads.
9 is 3 more than 6.
6 is 3 less than 9.

</td>
</tr>
</table>

Mastery

Write the numbers in order of size.

15	16	5	71	50

What is one more than…?

What is one less than…?

Mastery with Greater Depth

Use two of the digit cards to make a number greater than 50.
Use two of the digit cards to make a number less than 30.
Use two of the digit cards to make an odd/even number.
Use two of the digit cards to make a number between 47 and 59.
What is the smallest 2-digit number you can make?
What is the largest 2-digit number you can make?
Explain your reasoning.

Mastery with Greater Depth

If Sam places these 5 numbers in order, starting with the smallest number, which number will be in fourth position?

46 64 24 42 50

smallest largest

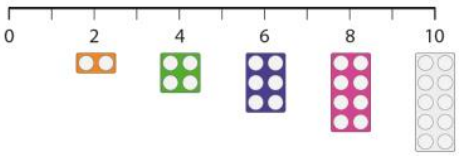
Odd and Even numbers

Allow children to investigate and sort the numicon plates. If no one sorts them into pointy and rectangular plates then suggest they could do this.
Which numbers are the pointy ones? Count to see.
Which numbers are the rectangular ones? Count to see.

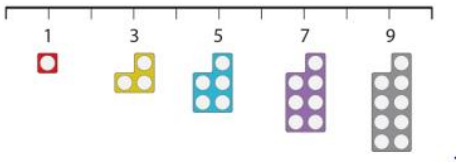
Explain that the rectangular plates are called even numbers and you can tell they are even because you can make them from pairs. Use a 2 numicon on top of other plates to demonstrate this.

E.g. 8 is even because it is made of pairs. 7 is not made of pairs. There is an odd one out. It is an odd number.

Use one set and put the numbers in order on a number line on the board – what do they notice? Repeat with the other set.



Establish that it is every other number starting at 1 for odd and 2 for even.



Images taken from NCETM – professional development materials

	Children to move onto sorting digit cards with larger numbers into odd and even. If they aren't sure – use tens frames and counters to see if they can make the number using pairs. Do they start to notice a pattern? Continue sequences, fill in the gaps and spot the mistake for odd number sequences. 3, 5, 7, _, _ _, 9, _, 13, 15, _ 17, _, 13, _, _, 7, _ Spot the mistake: 15, 17, 18, 19
Count in 2s forwards and backwards from any multiple **Count sets of objects by grouping in 2s**	Practise skip counting in 2s Highlight the pattern of missing out every other number by whispering the odd numbers and saying the even numbers out loud or associating 2 different actions with the odd and even numbers Ensure children begin to recognise that the ones digit will always be 0, 2, 4, 6, 8 by using a 100 square representation where the patterns in the ones is most evident. Practise counting in twos to 20 starting from any multiple of 2 and backwards to 0 starting at any multiple. Use the pattern in the ones column to support this. Continue sequences, fill in the gaps and spot the mistake for even number sequences/multiples of 2 including sequences that start at different multiples of2 forwards and backwards e.g. 18, 16, _, 12, _, _, 6 _ Children can now count objects which come in 2s using counting in 2s. e.g. wheels on bicycles, children lined up in pairs. Move onto show how you can count sets of single objects more efficiently by counting in 2s. Start with practical apparatus e.g. count a pile of socks in 1s and keep going wrong then pair them up and count in 2s more efficiently. Move onto pictures where the children draw circles around pairs of objects to help them count more quickly. **Mastery** | | 4 | 6 | | | 12 |

<table>
<tr><td></td><td>
<table>
<tr><th>Mastery with Greater Depth</th></tr>
<tr><td>I am going to count backwards from 20. How many steps will it take to reach 0? Convince me.

I am going to count backwards in twos from 20. How many steps will it take to reach 0? Convince me.</td></tr>
<tr><td>Sita says, 'If I start at 17 and count in twos I will say the number 28.'
Is she correct?

Explain your reasoning.</td></tr>
</table>
</td></tr>
<tr><td>Count in 5s forwards and backwards from any multiple

Count sets of objects by grouping in 5s</td><td>
Practise skip counting in 5s while putting up fingers on 1 hand or numicon 5 plates. Do you notice any patterns in the count?
Ensure children begin to recognise that the ones digit will always be 0 or 5 by using a 100 square representation where the patterns in the ones is most evident.

Use the pattern to support counting in fives to 50 starting from any multiple of 5 and backwards to 0 starting at any multiple. Continue sequences, fill in the gaps and spot the mistake for multiples of 5 including sequences that start at different multiples of 5 forwards and backwards
e.g. 45, 40, 35, ...
15, 20, _, 30, _, _, 45 _

Spot the mistake 5, 10, 15, 20, 30, 40,

Children can now apply counting in 5s to count objects which come in 5s more efficiently e.g. counting fingers, passengers in cars.

Move onto show how you can count sets of single objects more efficiently by grouping into sets of 5 and counting in 5s. Start with practical apparatus e.g. count a set of counters in 1s and keep going wrong then put them into sets of 5 and count in 5s more efficiently.

Move onto pictures where the children draw circles around groups of 5 objects to help them count more quickly.

<table>
<tr><th colspan="6">Mastery</th></tr>
<tr><td colspan="6">Complete:</td></tr>
<tr><td>5</td><td>10</td><td></td><td></td><td></td><td>30</td></tr>
</table>

<table>
<tr><th>Mastery with Greater Depth</th></tr>
<tr><td>Alin says, 'If I start at 5 and count in fives I will say the number 100.'
Is he correct?

Explain your reasoning.</td></tr>
</table>
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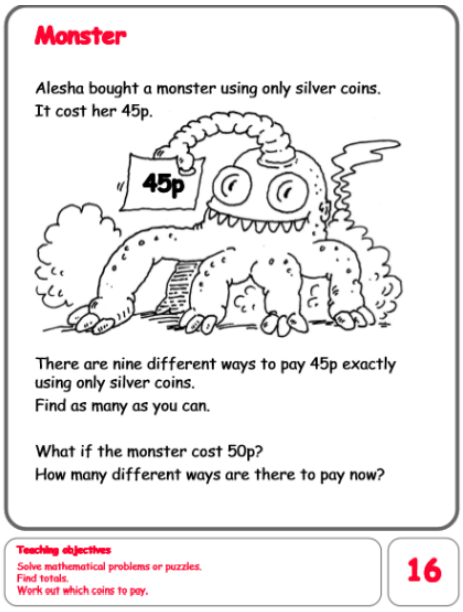
Problem solving and consolidation	Consolidate this learning through application into money and measures. Other substantial problems could include; Mathematical challenges for more able children Monster



Monster

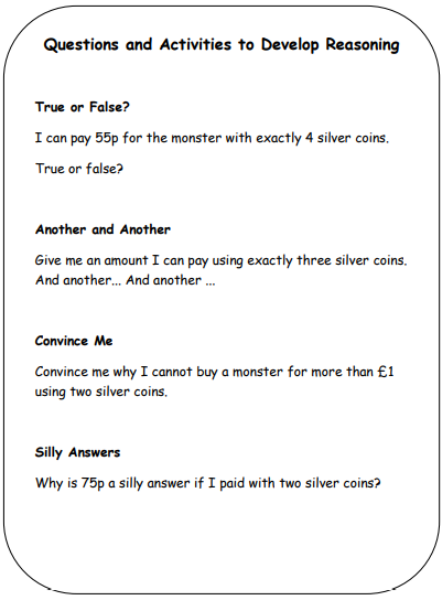
Alesha bought a monster using only silver coins.
It cost her 45p.

There are nine different ways to pay 45p exactly using only silver coins.
Find as many as you can.

What if the monster cost 50p?
How many different ways are there to pay now?

Teaching objectives
Solve mathematical problems or puzzles.
Find totals.
Work out which coins to pay.

16



Questions and Activities to Develop Reasoning

True or False?

I can pay 55p for the monster with exactly 4 silver coins.

True or false?

Another and Another

Give me an amount I can pay using exactly three silver coins.
And another... And another ...

Convince Me

Convince me why I cannot buy a monster for more than £1 using two silver coins.

Silly Answers

Why is 75p a silly answer if I paid with two silver coins?

Digging Deeper – Robot Place Value

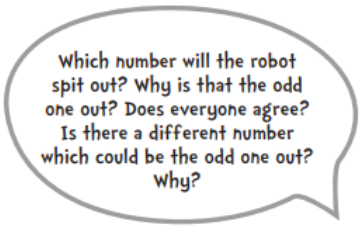
SETTING THE SCENE

Explain to the children that we have a visitor to our classroom today. Show the children an image of a robot, alien, creature or vehicle which will hook the children's interest. Explain that he is unusual because he only eats groups of numbers - and then he spits out the number which is the odd one out!

EXPLORE

Start by showing the children sets of numbers with a clear odd one out to ensure they have grasped the concept. For example, 14, 16, 13. Encourage complete sentences and clear explanations. For example, "13 is the odd one out because it is an odd number and the other two are even numbers". Repeat with other examples until children are confident and are giving clear reasons behind their choices.

Move onto sets of numbers where there is more than one possible odd one out, for example 43, 65, 30. Children may spot that 30 has nothing in the ones column, or that 30 is even. They may identify that 43 is not a multiple of five, whilst the other two are.



Which number will the robot spit out? Why is that the odd one out? Does everyone agree? Is there a different number which could be the odd one out? Why?