Models and images for counting on and back in ones and tens

Progression

5, 6, 7, ?   8

10, 9, 8, 7, ?   6

50, 60, 70, ?   80

100, 90, 80, 70, ?   60

5 6 7 ? ?

? ? 8 9 10

5 … 6   6 … 5

5 and 1 **more** is 6
1 **less** than 6 is 5

Imagine one **more** spot

Imagine one **less** spot

5 … 6, 7   7 … 6, 5

5 and 2 **more** is 7
2 **less** than 7 is 5

5 in the bag and 3 **more**

5 … 6, 7, 8

5 … 6, 7, 8   8 … 7, 6, 5

6 … 5, 4

5 and 3 **more** is 8
3 **less** than 8 is 5

6 **in** the bag, take 2 **out**

Number line

10 20 30 40 50 60 70 80 90 100

23p and 10p **more** is 33p
and 10p **more** makes 43p

23p 33p, 43p…

54p in the purse. Take 10p
out, another 10p and so on

54p 44p, 34p…

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

36 … 46, 56, 66

76 … 66, 56, 46

$6 + 10 = 16$ $96 - 10 = 86$
$16 + 10 = 26$ $86 - 10 = 76$
$26 + 10 = 36$ $76 - 10 = 66$
$36 + 10 = 46$ etc.

$36 + 20 = 56$ $76 - 30 = 46$

$25 + 10 = 35$

35 … 45, 55

35, 45, 55… $35 + 20$ is 55

$67 - 10 = 57$

67, 57, 47, 37…

$67 - 30$ is 37

67 … 57, 47, 37

7 17 27 37 47 57 67 77 87 97

7 17 27 37 47 57 67 77 87 97

Reception

- One, two, buckle my shoe, three, four knock at the door', what two numbers come next?
- '10, 9, 8, 7…' carry on until blast off!
- If we count round the circle starting at Sam with 3, who will say 5?

Year 1

Autumn
- What comes after 6? Before 9? After 17? Before 15?
- 15, 16, 17, what are the next three numbers?
- 10, 20, 30, what's the next number?
- If we count round the circle in ones starting at Chris with 10, who will say 14? Now count backwards starting at Suna with 13, who will say 5?

Spring
- What is 2 more than 6? 2 less than 9?
- 70, 60, 50, what are the next three numbers?
- I'm going to drop 10p coins one at a time into a tin. Put up your hand when I've dropped 70p into the tin.
- Count round the circle in tens starting at Margaret with 50, who will say 80?
- Count back in tens starting at Anil with 50, who will say 30?

Summer
- 3, 13, 23, what are the next two numbers?
- 54, 44, 34, what are the next two numbers?
- There are 25 beads at this end of the string, how many will there be if I slide 10 more along to join them? What will they look like? And 10 more? And 10 back again?
- Starting at 94 what is one less, now ten less, now one less … keep going, when will we stop?

Year 2

Autumn
- If we count round the circle starting at Julia with 23, who will say 53? If we count backwards starting at Li with 71, who will say 31?
- There is 43p in the purse, how much will there be if we add another 10p? If we start with 67p and take 10p how much will there be?
- There's a tower of 19 cubes, how many will we add to make it have 22 cubes?
- From zero, count in ones and back, now count in ones but whisper every other number. Can we count in twos from zero? Can we count in twos from 7? And back?

Spring
- There are 45 beads at this end of the string, how many will there be if I move 30 along to join them? And then 20 back again?
- There is 50p in the purse, how many 10p coins should we add to make it 80p?
- From zero count in tens, and back to zero. Now count in hundreds, and back.
- From zero, count in ones but whisper 1 and 2 shout 3, whisper 4 and 5 shout 6 and so on? And back? Can we count in threes?

Summer
- I've pushed a number of one beads to one side of the string, how many? How did you count them?
- There's 16 on the counting stick, how many would we count on to get to 21? There is 54, how many would we count back to reach 49?
- There is 23p in the purse, how many 10p coins would we add to make it 53p? How many would we then take out to make it 33p?
- From zero, count in tens, and back. Can we shout the 5 numbers in between the tens this time? And back? What if we start at 2, can we count in fives?

Year 3

Autumn
- 70, 80, 90, what are the next three numbers? 140, 130, 120, what are the next three numbers?
- 150, 250, 350, what are the next two numbers?
- 570, 470, 370, what are the next three numbers?
- What is 20 more than 170? 30 less than 250?
- Count in ones from zero, and back. Now count in twos, and back. Can we count in fours, and back? What if we start at 3?

Spring
- 73, 83, 93, what are the next three numbers? 872, 772, 672, what are the next three numbers?
- What is 1 less than 300? What is 1 more than 499?
- What is 10 more than 292? 10 less than 403?
- Count on 3 from 34, where do you land? Keep going. Count back 5 from 27 where do you land? Keep going.

Summer
- 463, 473, 483, what are the next three numbers? 733, 723, 713, what are the next three numbers?
- Count on 15 from 110 on the number line, where do you land? How did you count on?
- Count back from 176 to 171, how many did you count back?
- From 35 count in hundreds, and back. From 35 count in tens, and back. What digits change when we count in tens, hundreds, ones?

Year 4
- What is 1 more than 3449? 1 less? 10 more? 100 less?
- What is 60 more than 743? 50 less than 743?
- From zero, count in 25s and back. Can we count past zero?

Counting on and back in ones and tens

Potential difficulties

Children may:

- say the number names in order but do not associate them with the number of objects they are counting, even when they are able to touch the objects;

- count the objects that are organised linearly or in a table, but lose track when counting objects that are randomly dispersed, or that they cannot touch, as their counting is unsystematic;

- when counting from 9 to 10, 19 to 20, 29 to 30 etc and 99 to 100, not understand that the zeros are placeholders and later are unable to record the answers to one more than numbers such as 7899;

- when counting on or back from a given number, include the given number in their counting rather than starting from the previous or next number or counting the 'jumps';

- recite accurately the counting numbers when starting from one or zero, but have difficulty counting from other starting numbers and when counting backwards;

- understand the patterns of the digits within a decade, for example 30, 31, 32, …, 39 but struggle to recall the next multiple of 10;

- count confidently but cannot relate the 'teens' numbers to other numbers in the number system and do not recognise the relationship between 1, 11 and 21;

- count on or back in ones and tens but do not associate this with adding or subtracting ones and tens;

- be able to count on but do not understand how to apply this to addition or the combining of two or more groups of objects;

- associate counting on with addition but not as a way of finding the difference between two numbers that are close together;

- know the procedures for counting on or back when adding or subtracting but do not understand when it is more efficient to count on, for example when subtracting 19 from 22, or to count back when subtracting 3 from 22;

- confuse the vocabulary of counting 'backwards', 'forwards', 'up', 'down', 'on', 'back from' etc and count in the wrong direction.

Other useful models and images

Examples of progression and application in Years 4 to 6

These examples are drawn from section 6 of the *Framework for teaching mathematics from Reception to Year 6*.

Year 4

- Add/subtract 1, 10, 100 or 1000 to/from any integer, and count on or back in tens, hundreds or thousands from any whole number up to 10 000.

  What is 1 more/less than 3485, 4599, 6000?
  What is 10 ml more than 3250 ml?
  What is 100 m less than 5000 m?

- Count on or back in repeated steps of 1, 10 or 100.

  $2003 - 8$; $643 + 50$; $460 + 500$

- Find a small difference by counting up.

  $408 - 386$; $4000 - 3993$; $5003 - 4996$

- Add or subtract the nearest multiple of 10 and then adjust.

  $3 + 29$; $58 + 71$; $84 - 19$; $283 - 71$; $74 + 28$; $124 - 67$

Year 5

- Count on or back in steps of 0.1, 0.2, 0.3…

- Find differences by counting up through the next multiple of 10, 100 or 1000.

  $705 - 287$; $8006 - 2993$; $11.4 - 9.7$

- Add or subtract the nearest multiple of 10 or 100 and adjust.

  $458 + 71$; $583 - 71$; $274 + 196$; $405 - 197$

- Use informal pencil and paper methods to support, record or explain additions/subtractions.

  ```
    754
  − 286
      14  (to make 300)
     400  (to make 700)
      54  (to make 754)
     468
  ```

Year 6

- Count on in steps of 0.1, 0.2, 0.25, 0.5 …, and then back.

- Find the difference between a positive and negative integer or two positive integers in a context such as temperature or the number line.

  The temperature is −5°C. How much does it need to rise to reach 10°C?

- Find a difference by counting up.

  $8000 - 2785$; $7014 - 6572$

- Add or subtract the nearest multiple of 10, 100 or 1000 and then adjust.

  $4348 - 1997$; $37.6 + 19.8$

- Use informal pencil and paper methods to support, record or explain additions and subtractions.

  ```
    6467
  − 2684
       16  (to make 2700)
      300  (to make 3000)
     3467  (to make 6467)
     3783
  ```

COUNTING ON AND BACK IN ONES AND TENS