| Pupils should be taught to: | As outcomes, Year 4 pupils should, for example: |
|---|---|
| **Recognise and extend number sequences formed by counting on and back in steps of any size, extending beyond zero when counting back** | Use, read and write:<br>*next, consecutive, sequence, predict, continue, rule, relationship… sort, classify, property…* |

Count on and back. For example:
- From any number, count on in 2s, 3s, 4s, 5s to about 100, and then back.
- Count back in 4s from 40.
  What happens when you get to zero? Can you go on?
  What happens if you start at 39?
- Count in 25s to 500, then back.

Describe, extend and explain number sequences and patterns. For example, respond to questions like:

- What are the next three numbers in each sequence?
  
  38, 47, 56, 65…          135, 137, 139, 141…
  48, 41, 34, 27…          268, 266, 264…
  Explain the rule.

- Fill in the missing numbers in this sequence.
  Explain the rule.
  □, □, 45, 49, □, 57, 61, □

- Take a 6 × 6 number grid.
  Count on in 4s from 0.
  Shade the numbers you land on.
  What do you notice?

  | 1 | 2 | 3 | 4 | 5 | 6 |
  |---|---|---|---|---|---|
  | 7 | 8 | 9 | 10 | 11 | 12 |
  | 13 | 14 | 15 | 16 | 17 | 18 |
  | 19 | 20 | 21 | 22 | 23 | 24 |
  | 25 | 26 | 27 | 28 | 29 | 30 |
  | 31 | 32 | 33 | 34 | 35 | 36 |

  If you went on, would 44 be in your sequence? Or 52?
  How do you know?

  What happens if you start at 2?
  Is the pattern the same?

  Now try a 5 × 5 or a 10 × 10 number grid.

- What do you notice when you count from zero in:

  | twos | fours | eights |
  |---|---|---|
  | 2 | 4 | 8 |
  | 4 | 8 | 16 |
  | 6 | 12 | 24 |
  | 8 | 16 | 32 |

  (4s are double 2s; 8s are double 4s.)

- Count on or back from any number in steps of any single-digit number. Predict what will come next each time.
  What do you notice?

  Now try steps of 11.

**See also negative numbers (page 14) and adding or subtracting 10, 100 or 1000 (page 4).**

| **As outcomes, Year 5 pupils should, for example:** | **As outcomes, Year 6 pupils should, for example:** |
|---|---|

Use, read and write, spelling correctly:
*next, consecutive, sequence, predict, continue, rule, relationship, formula… classify, property…*

Count on and back. For example:
• From zero, count on in 6s, 7s, 8s, 9s to about 100, and then back.
• Count in 11s to 132, then count back. Can you go on past zero? What happens if you start at 133?
• Count in 25s to 1000, then back.
• Count in steps of 0.1 to 5.0, then back.

Describe, extend and explain number sequences and patterns. For example, respond to questions like:

• Describe and extend this sequence:
   −40, −37, −34…
   Explain the rule orally and in writing.

• Fill in the missing numbers in these sequences. Explain the rule orally and in writing.
   38, 49, □, □, 82
   □, □, 71, 62, □, 44

• Take a 9 × 9 number grid.
   Count on in 7s from 0.
   Circle the numbers you land on.
   What do you notice?

   If you went on, would 100 be in your sequence? Or 105? How do you know?

   What happens if you start at a number other than zero? Is the pattern the same?

   Now try a 10 × 10 or an 11 × 11 number grid.

• What do you notice when you count from zero in:

| threes | sixes | nines |
|---|---|---|
| 3 | 6 | 9 |
| 6 | 12 | 18 |
| 9 | 18 | 27 |
| 12 | 24 | 36 |

   (6s are double 3s; 9s are 3s plus 6s.)

• Count on or back from any number in steps of 19, 21 or 25. Predict what will come next each time. What do you notice?

   Do the same using the constant function on a calculator to generate multiples of, say, 55 or 70.

**See also negative numbers (page 15).**

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Use, read and write, spelling correctly:
*next, consecutive, sequence, predict, continue, rule, relationship, formula… classify, property…*

Count on and back. For example:
• From any number, count on in 6s, 7s, 8s, 9s to about 100, and then back.
• Count in 11s, 15s, 19s, 21s, 25s, then back. Can you go on past zero?
• Count in steps of 0.1, 0.5, 0.25 to 10, then back.

Describe, extend and explain number sequences and patterns. For example, respond to questions like:

• Describe and extend this sequence:
   1, 3, 6, 10, 15, 21…        (triangular numbers)
   Explain the rule orally and in writing.

• Fill in the missing numbers in these sequences. Explain each rule orally and in writing.
   10, 25, □, □, 70…
   1, 4, □, □, 25, 36, □…
   □, □, −61, −42, −23…

• Examine the patterns formed by last digits: for example, when repeatedly adding 4.
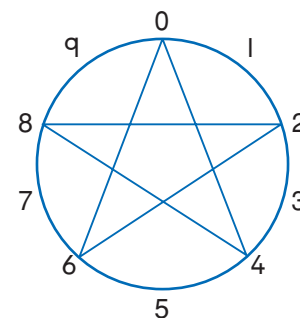
   How does the pattern change if you start at 1?



• Take a multiplication square. Find and explain as many patterns as possible: for example, the symmetry in the square, the pattern of square numbers, multiples of 3, multiples of 4…

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 |
| 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

Multiples of 4

**See also negative numbers (page 15).**