Models and images for ordering numbers to 100

Progression

Reception

- What is the number before 5? And after 5? Before 10? What is the number between 3 and 5?
- What numbers are between 7 and 10?

Year 1

Autumn
- What is the number before 10? After 10? Before 15? After 15?
- What comes after 20? Before 20?
- What numbers are in between 15 and 20?

Spring
- What is one more than 15? One less? One more than 19? One less?
- Which is bigger, 13 or 15? What number is in between?
- When we count in tens, what do we say before 40? And after 40?

Summer
- Give me a number between 10 and 20. Is it closer to 10 or 20?
- On this number track, where is 10? Where are 11, 19 and 9?
- Which is more, 30 or 70? Which is closer to 100?

Year 2

Autumn
-
  What could this number be? Why?
- What comes before 40? And after? After 99? Before 70?
- What number is halfway between 10 and 20?
- Is 28 closer to 20 or 30?

Spring
- Which is bigger, 35 or 53? Which is less, 17 or 71?
- What is one more than 69? One less than 50?
- What number lies in between 79 and 81?
- Give me a number between 65 and 75.

Summer
- Where is 50 on this number line? Where would you put 49? Why?
- Which number is halfway between 20 and 30? Between 70 and 80?
- On an empty 1–100 number line where are the tens? What number comes under 30? What is 10 more than 30? What number is 10 after 41? 10 before 39?
- Which tens number is 84 closest to?

Year 3

Autumn
- Which multiples of 10 are between 70 and 120?
- What number comes before 100? And after? Before 200? And after?
- Give me a number between 400 and 500.
- What number is halfway between 0 and 1000?

Spring
- Which is bigger, 250 or 520? 711 or 117? Why?
- What comes halfway between 200 and 300? Between 400 and 600?
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  What could the number be? Why?
- Is 460 closer to 400 or 500? What about 440, 450?

Summer
- What is the number between 699 and 701?
- Give me a number between 270 and 330.
- What is halfway between 0 and 500? Between 500 and 1000?
- Where would you put the following numbers on an empty 0–1000 number line and why? 500, 250, 750, 249, 751, 999, 1, 100, 400, 600.

Year 4

- What might this number be? Why?

- Draw arrows pointing to 6 and −4.

- Where would you place 55.5? Why?

Ordering numbers to 100

Potential difficulties

Children may:

- be able to order numbers from smallest to largest as this reflects the left to right images of numbers they are familiar with, but are less confident ordering from largest to smallest;

- lack an understanding of the distance between numbers and do not recognise that while 79 and 82 are close there are many more numbers between 19 and 62;

- not distinguish 13 from 30 when spoken and between 17 and 71 when written;

- order sets of consecutive numbers but not sets made up of more widely dispersed numbers such as 73, 9, 38, 16 etc;

- not recognise the pattern of the decades and cannot use this pattern to order numbers 60, 61, 62, 63 …
  70, 71, 72, 73 …
  80, 81, 82, 83 …;

- associate ordered numbers with the numbers on a number track but do not understand the structure of a hundred square or see it as a rearranged number track;

- complete sequences of missing numbers when presented with empty boxes that model a number track, but cannot complete number grids or use number lines as their mental images of the number system with tens as landmarks are limited;

- associate numbers on a number track with ordered adjacent boxes but do not understand that on a number line, numbers can always be placed between two adjacent numbers;

- not appreciate that the spaces between numbers on a number line are less important than the order of the numbers;

- recognise the image of a hundred square when all the numbers are represented but cannot imagine alternative grids, for example those made up of the even numbers or multiples of 5 or 10;

- have to count from 1 to find the number before or after a given number as they are insecure when counting from other starting numbers;

- complete sequences of numbers but do not understand the relative positions of numbers, for example that the position of 47 relative to 42 is the same as 67 relative to 62;

- not understand the importance of the most significant digits when ordering numbers to identify that 75 is bigger than 57 and later that 0.1 is bigger than 0.07;

- count in 10s but do not know what comes after 29 or before 71;

- have difficulty with the vocabulary 'more', 'most', 'less', 'in between' etc and cannot interpret meanings when solving word problems such as 'who has the least?'
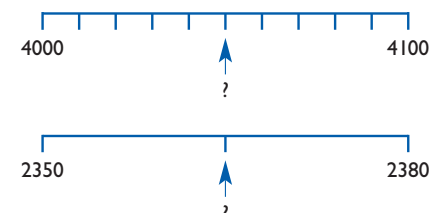
Other useful models and images

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

- Give one or more numbers lying between two given numbers and order a set of whole numbers less than 10 000.
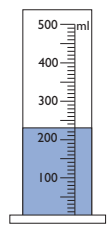

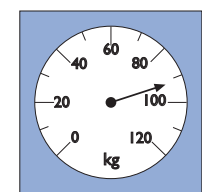A melon weighs between 1090 grams and 1110 grams. How heavy might it be?

- Order simple fractions; for example decide whether fractions such as $\frac{3}{8}$ or $\frac{7}{10}$ are greater or less than one half.

- Record estimates and readings from scales to a suitable degree of accuracy.

  How much water is in the measuring cylinder?

Mr Jones is standing on the bathroom scales shown below. Roughly what measurement is shown on the scales?

Year 5

- Give one or more numbers lying between two given numbers and order a set of whole numbers less than one million.

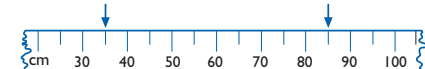 What number is halfway between 27 400 and 27 500, and 45 670 and 45 680?

  The distance to the crossroads is about 1 km, give or take 100 metres. How long could the journey be?

- Order a set of positive and negative integers (e.g. on a number line, or on a temperature scale).

  Write a whole number on each blank card so that the six numbers are in order.

  -9 ☐ -5 ☐ -1 ☐

- Record estimates and readings from scales to a suitable degree of accuracy.

  Read between divisions, e.g. what length in metres is indicated by each arrow?

Year 6

- Order fractions such as $\frac{2}{3}$, $\frac{3}{4}$ and $\frac{5}{6}$ by converting them to fractions with a common denominator, and position them on a number line.

  Mark each of these fractions on a line from 0 to 1 with 30 marked divisions:
  $\frac{3}{10}$, $\frac{1}{3}$, $\frac{2}{5}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{7}{10}$, $\frac{4}{5}$, $\frac{5}{6}$.

  What number is halfway between $5\frac{1}{4}$ and $5\frac{1}{2}$; $5\frac{1}{3}$ and $5\frac{2}{3}$?

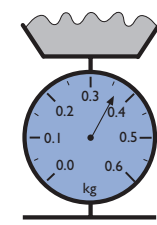- Give a decimal fraction lying between two others.

  Suggest a fraction between 4.17 and 4.18.

- Order a mixed set of numbers or measurements with up to three decimal places.

  Put these in order, smallest first: 7.745, 7.675, 6.765, 7.756, 6.776

- Record estimates and readings from scales to a suitable degree of accuracy.

  How many grams of flour are there on the scales?