Percentages as decimals

Notes and guidance

In the previous step, children began looking at the relationship between percentages and fractions. In this small step, they find decimal equivalents to percentages.

Use place value counters, bead strings and straws to recap that when 1 whole is split into 10 equal parts, each part is equal to 0.1 and when it is split into 100 equal parts, each part is equal to 0.01. Children relate this understanding to percentages, comparing 0.1 and 10%, and 0.01 and 1%. If 10% = 0.1 and 1% = 0.01, then 11% = 0.1 + 0.01 = 0.11

Children may begin to see a "trick" of writing "zero point" in front of the percentage to make a decimal, but this will cause confusion when converting single-digit percentages into decimals or, later, percentages greater than 100%. Exploring the equivalence of 0.01 and 1% using a variety of representations will help children avoid this misconception.

Things to look out for

- Children may see single-digit percentages as tenths rather than hundredths, for example 6% = 0.6
- Children may confuse percentages and decimals, for example $\frac{1}{2}$ = 0.50%

Key questions

- What is similar/different about percentages and decimals?
- How many tenths/hundredths/per cent are equal to 1 whole?
- What percentage is equal to one hundredth?
  What is one hundredth as a decimal?
- What percentage is equal to one tenth?
  What is one tenth as a decimal?

Possible sentence stems

- _____ = _____%
- There are _____ tenths/hundredths in 1 whole.
- _____% is equivalent to 1 whole.

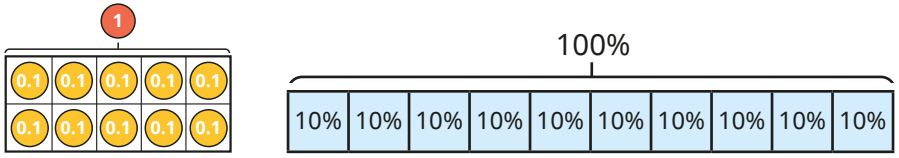
National Curriculum links

- Recognise the per cent symbol (%) and understand that per cent relates to "number of parts per 100", and write percentages as a fraction with denominator 100, and as a decimal fraction
- Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25

Percentages as decimals

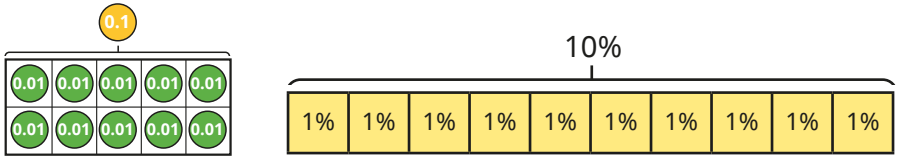
Key learning

- Use the models to complete the statements.



  - 0.1 = _____%
  - _____ = 30%
  - 0.8 = _____%
  - _____ = 100%

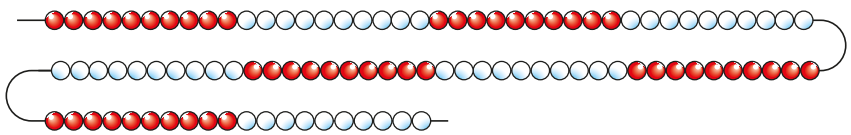
- Dora has used place value counters and a bar model to show that 0.01 is equivalent to 1%.



  Use Dora's fact to complete the statements.

  - 0.01 = _____%
  - _____ = 7%
  - 0.05 = _____%
  - _____ = 9%

- Mo uses a 100-piece bead string to represent 100%.



  Complete the statements.

  - 3 beads = _____ = _____%
  - 13 beads = _____ = _____%
  - 97 beads = _____ = _____%
  - _____ beads = _____ = 21%

- Write <, > or = to complete the statements.

90% ◯ 0.9 　　8.5 ◯ 85%

1% ◯ 0.1 　　50% ◯ 0.5

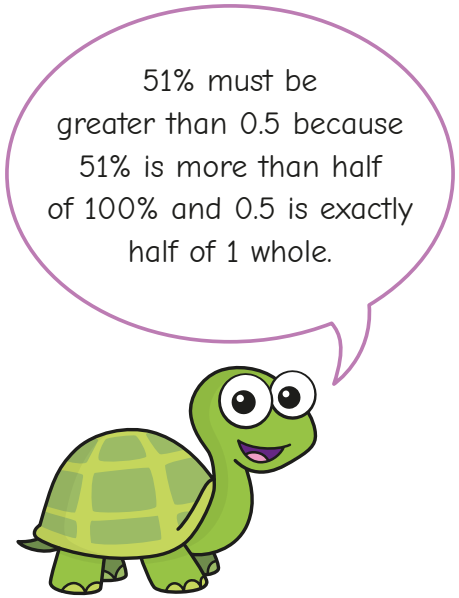
- Write the decimals and percentages in ascending order.

80%	0.08	0.88	18%	81%

Percentages as decimals

Reasoning and problem solving

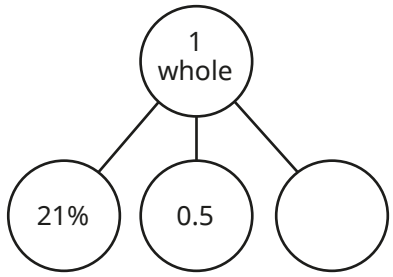
Tiny is comparing a percentage with a decimal.



Do you agree with Tiny?

Explain your answer.

Yes



What is the missing part?

Give your answer as a decimal and as a percentage.

0.29

29%

Using the digit cards only once for each solution, complete the comparison in as many different ways as you can.

3	4	5	6	7

$0.\_\_\_\_ < \_\_\_\_\% < \frac{3}{5}$

Compare answers with a partner.

multiple possible answers, e.g.

0.3 and 45%

0.46 and 53%