

Percentage, Fractions and Decimals

Section 1 — Reading the hundred grid

Per cent means "out of 100". Every square on a hundred grid is one hundredth of the whole — which is $1/100$, 0.01 and 1% all at once.

Worked example. 25 squares shaded out of 100.

Fraction: $25/100 = 1/4$ • Decimal: 0.25 • Percentage: 25%

Three names, one amount.

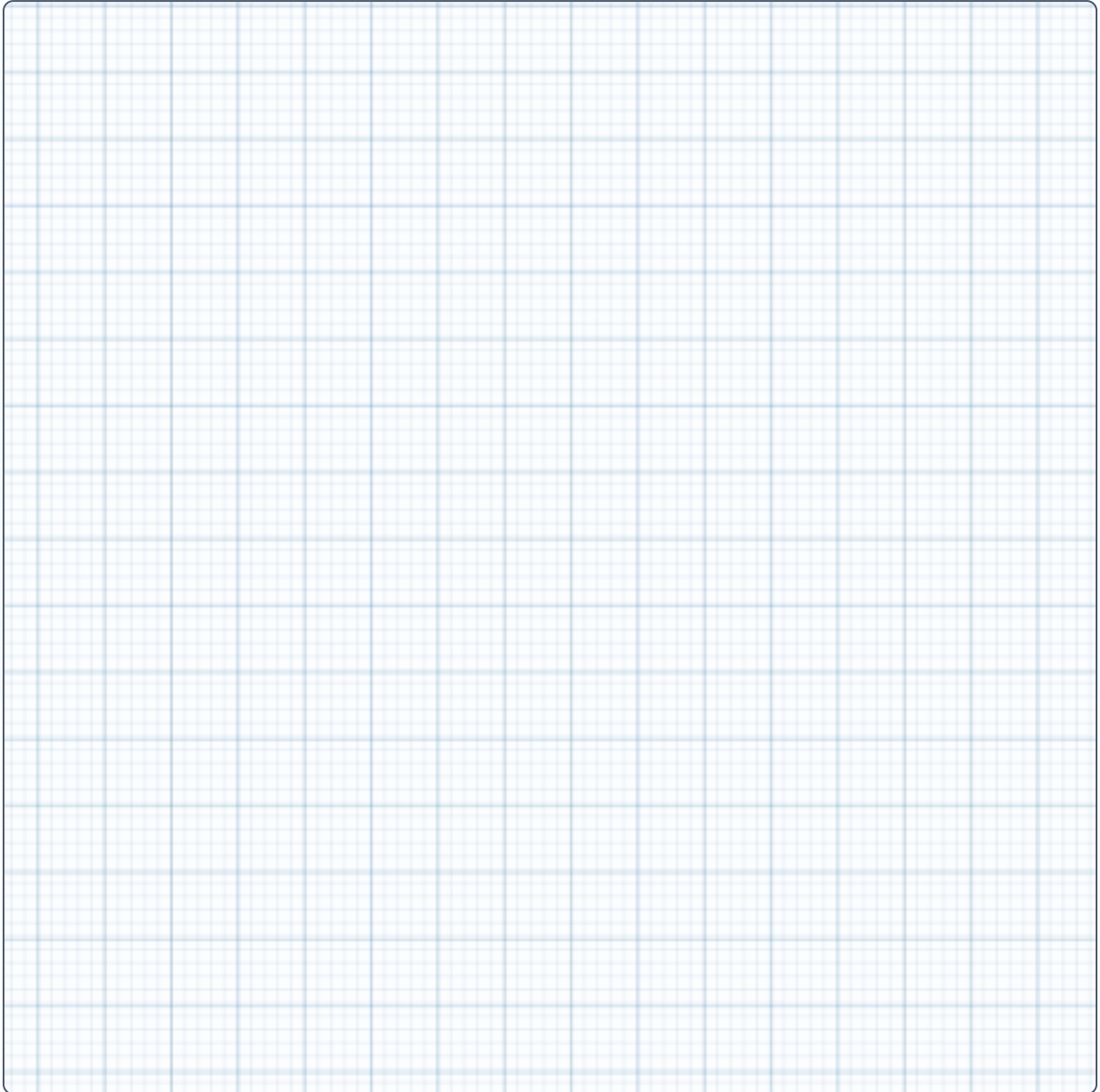
Q1. A hundred grid has 30 squares shaded. Write the shaded amount three ways.

Fraction: _____ Decimal: _____ Percentage: _____

Q2. A hundred grid has 7 squares shaded. Write the shaded amount three ways. *Careful — this one catches people!*

Fraction: _____ Decimal: _____ Percentage: _____

Q3. Shade your own hundred grid to show 45%, then write it as a fraction and a decimal.



Fraction: _____ Decimal: _____

Section 2 — The benchmark conversion table

Converting is just renaming. Fraction → percentage: rename with denominator 100 (that's your equivalent-fractions skill from last lesson). Percentage ↔ decimal: read the percentage as hundredths.

Worked example. Convert $\frac{1}{4}$ and 40%.

$$\frac{1}{4} = (1 \times 25) / (4 \times 25) = 25/100 = 25\% = 0.25$$

$$40\% = 40/100 = 0.40 = 0.4, \text{ and } 40/100 = 2/5 \text{ in simplest form.}$$

Single-digit percentages: $5\% = 5/100 = 0.05$ — NOT 0.5. Check on the grid: 5% is only 5 little squares.

Q4. Complete the benchmark conversion table. Two cells in the first row are done for you: $10\% = 1/10 = 0.1$.

Percentage		Fraction (simplest form)	Decimal
10%			
20%			
25%			
50%			
75%			
100%			

Q5. Convert each value. Show the hundredths step (e.g. $\frac{3}{5} = 60/100 = 60\%$).

a) $\frac{7}{10} =$ _____ % b) $0.9 =$ _____ % c) $40\% =$ _____ (fraction, simplest form)

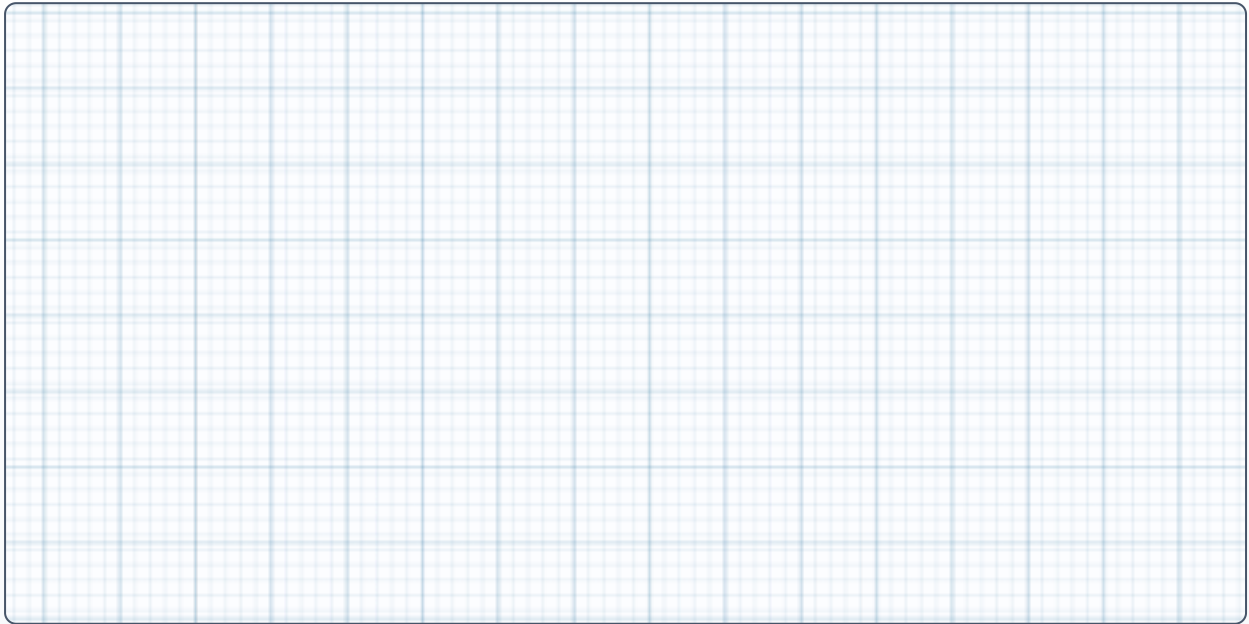
d) $\frac{1}{5} =$ _____ % e) $5\% =$ _____ (decimal) f) $0.03 =$ _____ %

Section 3 — The triple number line

A percentage, its fraction and its decimal all sit on the **same point** of the number line. If your three labels land on different points, one of your conversions is wrong.

Anchor the easy ones first: 0, $\frac{1}{2}$ (50%, 0.5) and 1 (100%). Then everything else is "closer to which anchor?"

Q6. Draw a 0–1 number line and mark these five values in the correct places, labelling each point with ALL THREE notations: 10% , $\frac{1}{4}$, 0.5 , 75% , 1 .



Q7. Which benchmark does each value sit closest to on the number line — 0% , 25% , 50% , 75% or 100% ?

a) $0.23 \rightarrow$ _____ b) $\frac{9}{10} \rightarrow$ _____ c) $0.52 \rightarrow$ _____ d) $4\% \rightarrow$ _____

Section 4 — Comparing and ordering

To compare mixed values, convert them all to the **same form** first. Percentages usually make the comparison easiest — everything becomes "out of 100".

Worked example. Which is larger, 0.4 or $\frac{1}{4}$?

Convert both to percentages: $0.4 = 40\%$ and $\frac{1}{4} = 25\%$. Since $40 > 25$, 0.4 is larger.

Q8. Circle the larger value in each pair. Show the conversion you used.

a) 30% or $\frac{1}{4}$ working: _____

b) 0.6 or 65% working: _____

c) $\frac{7}{10}$ or 0.07 working: _____

Q9. Order from smallest to largest: 0.45 , $\frac{1}{2}$, 40% , $\frac{3}{4}$, 0.09

Convert them all to one form first (percentages are easiest):

Order: _____

Q10. Mia scored $\frac{17}{20}$ on her spelling test and 80% on her maths test. Which score is better? Prove it by converting.

Section 5 — Discounts and different-sized wholes

Percentages are everywhere in shops. A **discount** is a percentage taken OFF the price — and a percentage is always a percentage *of something*. The size of the whole matters.

For the same item, a bigger percentage off is always the better deal. But comparing percentages of *different* wholes? Watch out — that's Q13.

Q11. A shop offers the same \$40 jumper with three different discount tags: 10% off, 25% off, or 50% off. Which tag is the best deal, and what fraction of the price do you save with each?

Discount	Fraction saved	
10% off		
25% off		
50% off		

Best deal: _____

Q12. Explain why "50% off" means the same as "half price". Use the words per cent and fraction in your answer.

Q13. Zoe's water bottle holds 500 mL and is 50% full. Leo's bottle holds 2 L (2000 mL) and is only 25% full. Leo says "Zoe has more water because 50% is bigger than 25%." Is Leo right? Explain what he has forgotten about percentages.

Section 6 — Challenge

Optional extension — for when Sections 1–5 are finished and checked.

Q14. 25% is a quarter. Half of 25% is 12.5%. Write 12.5% as a fraction in simplest form and as a decimal.

Fraction: _____ Decimal: _____

Q15. Try to convert $\frac{1}{3}$ to a percentage using the hundredths method. What happens? What percentage is $\frac{1}{3}$ close to?

Q16. Would you rather have 50% of \$10 or 25% of \$30? Prove your choice with working.

Q17. Design your own "percentage trap" question like Jai's ($5\% = 0.5$?) — a conversion that LOOKS right but is wrong. Write the trap, then explain the correct answer.
