

Fraction-decimal-percentage equivalence mastery

CURRICULUM ALIGNMENT

NUM.FRC.4a

explore (model, compare and convert) the relationships between fractions, decimals and percentages.

NUM.PVT.4

investigate how decimals and percentages (and fractions) can be compared, ordered and expressed in related terms.

INTERACTIVES Phone Battery · challenge, display, explore

WHAT THIS LESSON TEACHES

The same amount written three ways – as a fraction, a decimal and a percentage. The value never changes; only the way we write it down does.

→ $7/10 = 0.7 = 70\%$ all describe the same amount of shopping.

→ $3/4$ means 3 divided by 4 = 0.75.

MODEL THIS ON THE BOARD

CONVERT $7/10$ TO DECIMAL AND PERCENT

- 1 Divide 7 by 10 to get the decimal 0.7.
- 2 Multiply 0.7 by 100 to get the percentage 70%.

LESSON ARC

Open with $3/8$, 0.375 and 37.5% on the IWB and take three hands-up answers on whether they name the same amount. Walk four batteries aloud — $3/8$, $2/5$, $7/8$, then recurring $1/3$ — writing both the dot and ‘and so on’ forms on the board. Pupils convert fifths and $3/4$ together on the battery interactive, then complete a three-column equivalence table in their copybooks. Class Challenge mixes target forms including $1/3$; maths talk settles which form suits comparing, calculating or sharing. Student Activity Book is the paper practice.

TEACHING MOVES

1. **Getting Started.** Give five seconds of quiet think-time, then take three hands-up answers only — no open call-outs. Do not confirm yet. Flag the pupil who finds 37.5% hardest at a glance: that half-percent is why this lesson trains reading all three forms at speed.
2. **Watch and Notice.** Walk each battery one at a time, pointing at every label as you say it. Stress top-divided-by-bottom on $3/8$; pause for a class prediction before $7/8$. On $1/3$, refuse a silent round to 0.33 — write 0.333... and $0.\overline{3}$ on the board, then the matching percentage forms, and have one pupil copy both notations under yours.
3. **Try It Together.** Work $1/5$, $2/5$, $3/5$, then $3/4$ in that order. Before each board turn, whole-class hands-up prediction of the decimal and percentage; after each, revoice one pupil’s reasoning so the watchers convert all four. Slow on $3/4$: ask why it breaks the twenty-percent steps before checking.
4. **Complete the Equivalence Table in Your Copy.** Pupils draw Fraction | Decimal | Percentage and fill the four given starters, underlining the simplest fraction on each row. Walk the room glancing only — this is practice, not marking. Note who writes 0.6 for 60% but leaves the fraction unsimplified for the wrap.

5. **Class Challenge.** Keep board turns brisk: class says the other two forms aloud before the pupil sets the battery and presses Check. On the $\frac{1}{3}$ stretch, be explicit — a green Check on 33% does not mean $\frac{1}{3}$ equals 33% exactly; say we settled for the nearest whole percent because the threes never end.
6. **What Did We Notice?.** Pose the three jobs — comparing prices, splitting a bill, working a discount — and listen for pupils assigning forms: percentages share a scale of 100, fractions split a whole fairly, decimals line up for calculating. Revoice: the best form isn't fixed; you pick the one that suits the job. Head off any claim that $\frac{1}{3}$ equals 0.33 exactly.

COMMON MISCONCEPTIONS

- ⚠ Pupils treat $\frac{1}{3}$ as 0.33 or 33% exactly, and leave believing the rounded form is the same amount. Stop and rewrite 0.333... beside 0.33 on the board. Point at the battery's nearest-whole-percent reading and say aloud: green on 33% means close, not equal — the threes never end.
- ⚠ Pupils divide the wrong way round — $8 \div 3$ instead of $3 \div 8$ — and get a decimal bigger than 1. Return to the battery for $\frac{3}{8}$. Trace the fraction strip: three of eight equal parts. Say 'top divided by bottom' while you write $3 \div 8 = 0.375$, then contrast what $8 \div 3$ would mean.
- ⚠ Pupils put a recurring dot above every digit (0.333) or treat a short run of threes as finished. Cue: one dot above the digit that repeats, or write a few threes and 'and so on'. Have the pupil rewrite 0.3 and 0.333... under your board models before the class moves on.

DIFFERENTIATION

EMERGING

- Stay on the tidy tenths and quarters ($\frac{1}{4}$, 0.5, $\frac{1}{5}$) while the class meets $\frac{3}{8}$ and $\frac{1}{3}$; pupils fill only the decimal column first, then the percentage.
- On the copybook table, pre-write the fraction column so pupils only convert out to decimal and percentage.

DEVELOPING

- After the copybook rows, ask: swap 60% for 6% — what happens to the decimal and the fraction, and why did both shift one place?
- Before Class Challenge, have them predict $\frac{4}{5}$ from the fifths pattern already built, then justify without setting the battery.

PROFICIENT

- During Class Challenge, after a clean match, ask which of the three forms made the battery level obvious fastest — and why that form won for this target.
- On the copybook page, add a fifth row of their own choosing that forces a recurring decimal, written both as 0.3 and as 0.333...

✂ **Cross-curricular:** Link to euro shop signs: a 25% off sticker versus a $\frac{1}{4}$ -off sign — which form makes the discount easiest to work out?

ANSWER KEY

Scaffold: visual check on the page

Q1: $0.7 = 70\%$

Q2: $0.25 = 25\%$

Q3: $0.375 = 37.5\%$

a) Always : All three name the same amount.

b) Always : Any fraction has an equivalent decimal and percentage.

c) Sometimes : True for $\frac{3}{4} = 0.75$; false for $\frac{1}{2} = 0.5$ or $\frac{1}{8} = 0.125$.

d) Sometimes : True for a price that rises to 150%; false for half a cake, which is 50%.

EXTENSION SHEET · STRETCH ANSWERS

S1: 17 squares (17% of 100 = 17)

S2: 210

S3: 480

S4: 64% (64 out of 100)