

Lesson 37 **NUMBER****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% side by side on the IWB — same amount or three different ones? Then run the battery-fill equivalence interactive, dividing top-by-bottom for the decimal and sliding the point two places for the percentage, finishing on the recurring $1/3$. Pupils work fifths and $3/4$ together at the board, then complete a three-column table in their copies. Class Challenge converts targets given in mixed forms, ending on the recurring stretch.

TEACHING MOVES

1. **Getting Started.** Give five seconds of quiet think-time, then take three hands-up answers only — no open call-outs. Don't confirm yet; let the disagreement sit. Listen for the pupil who flags 37.5% as hardest to read because of the half-percent, and use that to set up the lesson's focus on reading all three at speed.
2. **Watch and Notice.** Walk each battery one at a time, pointing at all four labels as you say them. On $3/8$ say 'three divided by eight' aloud and stress top-divided-by-bottom — the common slip is dividing the wrong way round. On $1/3$, name it as recurring and point to the dots; do NOT let the class silently round it to 0.33.
3. **Try It Together.** Before each pupil sets the battery, ask the whole class to predict the decimal and percentage with hands up, then let the pupil set it and check. After each round revoice one pupil's reasoning ('so two fifths is 0.4 because you doubled 0.2'). Plant the planned pause on $3/4$: 'why doesn't three quarters fit the twenty-percent steps?'
4. **Complete the Equivalence Table in Your Copy.** Walk the room glancing at rows — this is practice, not marking. Watch for pupils who write 0.6 for 60% but stall on simplifying back to a fraction. No individual correcting; jot common slips for the wrap-up.
5. **Class Challenge.** Keep board work brisk — each target is stated in a different form on purpose, so have the class say the other two forms aloud before the pupil presses Check. On the recurring $1/3$ stretch, be

explicit: a green Check on 33% does NOT mean $1/3$ equals 33% exactly — 'we settled for the nearest whole percent because the threes never end'.

6. **What Did We Notice?** Steer pupils to separate the jobs: percentages for comparing (shared scale of 100), fractions for sharing fairly, decimals for calculating (columns line up). Revoice a strong answer — 'so the best form isn't fixed; you pick the one that suits the job' — and head off anyone claiming $1/3 = 0.33$ exactly.

COMMON MISCONCEPTIONS

⚠ Pupils divide the wrong way round for the decimal — for $3/8$ they compute $8 \div 3$ and get something over 2, or write 0.83.

Stop and set the battery to $3/8$ on the interactive — it sits well below halfway, so a decimal over 2 can't be right. Say 'top divided by bottom' every time: three divided by eight. Have the pupil re-read the battery level against their answer.

⚠ Pupils treat $1/3$ as 0.33 exactly and read the green Check on 33% as proof they're equal.

Point to the recurring dots on the battery model — the threes never stop, so the battery can only get close. Say 'we settled for the nearest whole percent because it never lands neatly.' Contrast with $1/4$, which does land exactly on 25%.

⚠ In the copybook table pupils convert 60% to 0.6 correctly but leave the fraction column blank or unsimplified (e.g. 60/100).

Note it silently during the walk-round, then raise it in the wrap: show 60/100 on the IWB and ask what both numbers share. Divide by 20 together to reach $3/5$ — the underline-the-simplest-fraction instruction is the reason it matters.

DIFFERENTIATION

EMERGING

- Give the equivalence reference card ($1/2$, $1/4$, $1/5$, $3/4$) so these pupils self-check against known landmarks rather than converting cold.
- In the copybook table, pre-fill the fraction column and let them fill only decimal and percentage — one conversion direction, not two.

DEVELOPING

- After the table, ask them to add a fifth row of their own choosing and prove all three forms match on the battery model.
- Swap $7/10$ for $7/8$ and ask whether the decimal stops or recurs before they work it out — justify the prediction first.

PROFICIENT

- Pose: 'find a fraction whose decimal recurs but isn't thirds — how did you spot it before dividing?' Let them hunt on the battery model and explain the pattern in denominators.
- Pull them ahead into the Student Activity Book page and ask them to write a one-line rule for choosing the best form for a shopping discount.

✚ **Cross-curricular:** Tie to the shopping context — pupils find a real sale sign (e.g. 25% off) and write the discount as fraction, decimal and percentage.

ANSWER KEY

Scaffold: visual check on the page

Q1: $0.7 = 70\%$

Q2: $0.25 = 25\%$

Q3: $0.375 = 37.5\%$

a) Always — The three forms show exactly the same amount.

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

c) Never — It depends on the situation which form is easiest.

d) Never — Percentages over 100 mean more than the whole.

EXTENSION SHEET · STRETCH ANSWERS

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

S2: 210

S3: 480

S4: 64% (64 out of 100)