Lesson 34 NUMBER

Converting decimals to fractions

CURRICULUM ALIGNMENT

NUM.FRC.4a explore (model, compare and convert) the relationships between fractions, decimals and percentages.

INTERACTIVES Place Value Blocks (Dienes) · challenge, display, explore

WHAT THIS LESSON TEACHES

The place value of the last decimal digit names the bottom number of the fraction. Simplify by dividing top and bottom by their greatest common divisor.

→ 7 is 7/10.

→ 25 is 25/100 which simplifies to 1/4.

MODEL THIS ON THE BOARD

CONVERT 0.45 TO A FRACTION

1. Look at the last digit in the hundredths place so the denominator is 100.
2. Write 45 over 100.
3. Divide top and bottom by 5 to get 9/20.

LESSON ARC

Open with the €0.25 apple price tag and quiet think-time — which fraction hides inside a quarter of a euro? On the place-value mat, model 0.25 → 25/100 → 1/4, writing the division out so pupils see the top and bottom divide together. Build 0.4, 0.35 and 0.06 together, predicting the denominator before each build. Pupils record four in copybook, then the class works the challenge bank ending on 0.375 and the 0.08 trap.

TEACHING MOVES

1. **Getting Started.** Display €0.25 as pupils settle. Give five seconds of silent think-time, then take two or three hands — not open call-outs. Don't confirm the answer; let the place-value mat reveal it next step.
2. **Watch and Notice.** On 0.25, point to the hundredths column: 'the last digit lives here, so the bottom is 100.' Then model the search aloud — 'does 5 go in? Yes. Anything bigger? 25.' — and write 25/100 ÷ 25/25 = 1/4 so both parts divide together. On 0.125, show the keep-dividing-by-5 route (125/1000 → 25/200 → 5/40 → 1/8) so pupils who can't spot 125 at once still have a method.
3. **Try It Together.** Take a whole-class prediction first — how many places, so what's the bottom — then one pupil builds each of 0.4, 0.35, 0.06 on the mat. Slow right down on 0.06: point to the empty tenths column and ask why the bottom is still 100. Revoice: 'the number of decimal places tells us the bottom, not the digits themselves.'
4. **Write the Fraction in Your Copy.** Pupils write 0.8, 0.45, 0.08, 0.5 as fractions, show the dividing number, and circle the simplest form. Walk the room glancing for two things: does the bottom match the number of decimal places, and is the dividing step actually shown? This is practice, not marking.
5. **Class Challenge.** Brisk turns at the board through 0.8, 0.45, 0.375, 0.08. Take the class's denominator prediction before each build, then use the Check button to confirm. Keep it moving — don't re-explain the method, just confirm and go.

6. **What Did We Notice?.** Ask how the number of decimal places fixes the bottom before you even read the digits. Listen for pupils naming places (not counting digits), and for the test-small-factors-and-work-up method when simplifying. Head off the 0.06 = 6/10 slip if it surfaces.

COMMON MISCONCEPTIONS

⚠ Pupils write 0.06 as 6/10 — they read the 6 and ignore that the tenths column is empty.

Build 0.06 on the place-value mat and have a pupil point to which column the 6 sits in. The empty tenths column is a real place, so there are two decimal places and the bottom is 100 → 6/100. Contrast it side by side with 0.6 = 6/10.

⚠ Pupils stop simplifying too early — they get 25/100 to 5/20 by dividing by 5 and think they're finished.

Ask 'does anything still go into both 5 and 20?' Keep pushing until nothing but 1 divides in. Write the chain out so pupils see 5/20 → 1/4, and name that spotting the bigger factor (25) finishes it in one step.

⚠ On 0.375 pupils freeze because they can't see that 125 divides into both parts.

Show the keep-dividing-by-5 route on the board: 375/1000 → 75/200 → 15/40 → 3/8. Name that 5 × 5 × 5 = 125, so three small divisions equal one big one. Reassure them the slow route lands in the same place.

DIFFERENTIATION

EMERGING

- Stay in tenths only — 0.4, 0.8, 0.5 — so the bottom is always 10 and pupils master naming the denominator before hundredths arrive.
- Pre-write the '÷' step layout in their copy so pupils fill in the dividing number rather than inventing the whole line.

DEVELOPING

- After the copybook four, give a decimal that needs two dividing steps (e.g. 0.24 = 24/100 → 6/25) and ask them to show both steps.
- Ask pupils to write a decimal that simplifies to exactly 1/2, then another that gives 1/4 — working the rule backwards.

PROFICIENT

- During the Class Challenge, narrate a harder variant at the board: 0.625 or 0.875 — a thousandths decimal that hides a big common factor — and ask them to predict the simplest form before the build.
- Pose: 'why can every one-, two- or three-place decimal be written as a fraction, but a fraction like 1/3 will not stop as a decimal?' Let them wrestle with it aloud.

↗ **Cross-curricular:** Tie to money — pupils write shop prices like €0.75 and €0.20 as fractions of a euro (3/4, 1/5).

ANSWER KEY

Scaffold: visual check on the page

Q1: 4/5

Q2: 2/5

Q3: 1/4

Q4: 7/20

Q5: 3/8

a) Always — One decimal place means tenths.

b) Always — Divide 25 and 100 by 25.

c) Never — Decimals less than 1 give proper fractions.

d) Always — That keeps the value the same.

EXTENSION SHEET · STRETCH ANSWERS

S1: $0.75 = 3/4 = 75\%$

S2: $3/5 = 0.6 = 60\%$