Lesson 29 NUMBER

Adding and subtracting fractions with unlike denominators

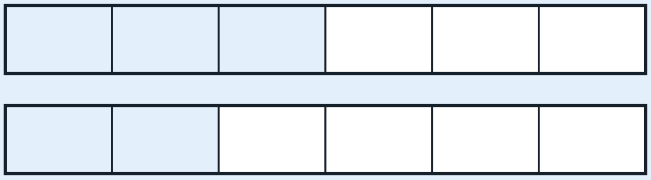
CURRICULUM ALIGNMENT

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

INTERACTIVES Fraction Strips · challenge, display, explore

WHAT THIS LESSON TEACHES

You can only add or subtract fractions once they share a **common denominator**. Change them, then add or subtract the tops.



→ 1/2 + 1/3 → 3/6 + 2/6 = **5/6**.
→ 3/4 − 1/6 → 9/12 − 2/12 = **7/12**.

MODEL THIS ON THE BOARD

WORK OUT 1/2 + 1/3

1. Common denominator of 2 and 3 is **6**.
2. 1/2 = 3/6; 1/3 = 2/6.
3. Add the tops: 3/6 + 2/6 = **5/6**.

LESSON ARC

Open with the pizza puzzle — does 1/4 + 1/3 = 2/7? — and gather a few gut reactions without confirming. On the fraction-strips interactive, show a quarter and a third are different sizes, rename both to twelfths, and combine to 7/12. Pupils rework four sums in their copybook, always showing the renaming line. The Class Challenge bank consolidates at the board; Student Activity Book follows.

TEACHING MOVES

1. **Getting Started.** Take three hands-up answers to the 2/7 claim, not open call-outs. Don't confirm or correct — let the doubt sit. This is the misconception the whole lesson dismantles, so just gather gut reactions and move on.
2. **Watch and Notice.** Walk each example on the fraction-strips interactive one at a time. On 1/4 + 1/3, point straight back at the hook: 'this is why 2/7 was wrong — the slices have to be the same size first.' On 5/6 − 1/2 stress the simplify step: 2/6 is correct but 1/3 is tidier. Name the common denominator aloud before every add or subtract.
3. **Try It Together.** Pupils take turns at the board; the class agrees or corrects aloud. For each pair, ask 'which fraction needs renaming?' before any combining — on 2/5 + 3/10 only the fifths change. Clear and re-shade the one set of strips by hand between problems. Any pupil adding the bottom numbers goes straight back to the strips so the size mismatch is visible.

4. **Rewrite and Simplify in Your Copy.** Walk the room glancing at two things: the renaming line and the circled simplest form. Watch for pupils who jump to an answer with no common-denominator step shown — that's the line that proves they understood, so insist on it.
5. **Class Challenge.** Brisk turns at the board. Before each Check, let a short gap sit for the watching class to agree or correct the renaming aloud — the interactive only checks the final shaded answer, so that spoken confirmation is the pupils' job each turn. Keep it moving, don't re-explain each one.
6. **What Did We Notice?.** Listen for pupils spotting that when one denominator divides into the other (6 and 3, or 8 and 4) only the smaller-bottomed fraction needs renaming. Revoice a strong answer: 'so if one bottom number fits into the other, that bigger one is already the common denominator.'

COMMON MISCONCEPTIONS

⚠ Pupils add across the top AND bottom: 1/4 + 1/3 = 2/7. They treat both numbers as ordinary sums.

Lay a quarter strip beside a third strip on the interactive — visibly different sizes. 'We can't add slices of different sizes.' Rename both to twelfths and count: 3/12 + 4/12 = 7/12. Keep the pizza on screen so 7/12 lands against the wrong 2/7.

⚠ A pupil renames both fractions even when one denominator already fits — e.g. on 5/6 − 1/2 they hunt for twelfths instead of seeing sixths already works.

Ask 'does 6 divide into anything we already have here?' Show on the strips that the half lays exactly across three sixths, so only the half needs renaming. Sixths is already the common size.

⚠ Pupils stop at a correct-but-untidy answer like 2/6 and don't simplify.

Build 2/6 on the strips and slide a 1/3 strip alongside — same length. 'Both are right, but we always write the tidiest one.' Circling the simplest form in the copybook makes the habit visible.

DIFFERENTIATION

EMERGING

- Stay with pairs where only one fraction needs renaming (1/2 + 1/4, 5/6 − 2/3) so the size-mismatch idea isn't buried under double renaming.
- Let these pupils shade and count the renamed parts directly on the strips before writing the algebraic line in their copy.

DEVELOPING

- After the copybook four, give 2/3 + 1/6 and ask: which denominator did you choose and why was it the smallest that worked?
- Pose a missing-number variant: 5/12 + ?/4 = 8/12 — find the second fraction by renaming.

PROFICIENT

- At the IWB during Class Challenge, narrate a harder variant for fast finishers: 3/4 + 2/5, where neither denominator fits the other — ask them to predict the common denominator before shading.
- Pull them ahead into the Student Activity Book page, asking them to explain to themselves in writing why 2/7 can never be the answer to 1/4 + 1/3.

Cross-curricular: Tie to home economics — split a real recipe so two people each take an unlike fraction (1/3 and 1/4 of the flour) and find the total used.

ANSWER KEY

Warm-up: a) 13/12 b) 14/9 c) 5/4 d) 7/6

Q1: 27/20

Q2: 13/10

Spot: You can't add fractions until the denominators match. Rewrite as 3/6 + 2/6 = **5/6**. (5/6 is more than a half — 2/5 is less, so it can't be right.)

EXTENSION SHEET · STRETCH ANSWERS

S1: 13/28

S2: 13/10

S3: 17/30