TEACHER RESOURCE BOOK · MATHS · 6TH CLASS

Lesson 41 NUMBER

Equivalent ratios and simplifying ratios

CURRICULUM ALIGNMENT

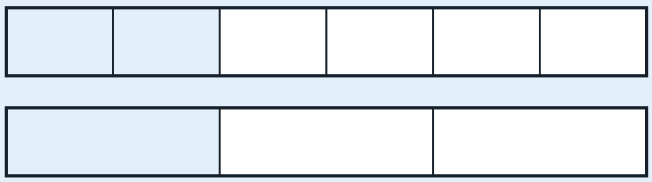
NUM.FRC.4b investigate proportionality and ratios of quantities (sets).

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

INTERACTIVES Ratio Bars · challenge, display, explore

WHAT THIS LESSON TEACHES

Multiplying or dividing **both parts by the same number** gives an **equivalent ratio**. Dividing by the HCF gives simplest form.



→ 4 : 6 = **2 : 3** (divide both by 2).

→ 2 : 5 = 6 : 15 (multiply both by 3).

MODEL THIS ON THE BOARD

SIMPLIFY THE RATIO 12 : 18

1. Find the HCF of 12 and 18 → **6**.
2. Divide both parts by 6: 12 ÷ 6 = 2, 18 ÷ 6 = 3.
3. Simplest form is **2 : 3**.

LESSON ARC

Open with 2:3 and 4:6 on the board and a hands-up split — same or different? Don't confirm. On the ratio-bars interactive, scale 2:3 to 4:6 to 6:9, stressing both parts get the same multiplier and the bars keep their relative length. Pivot to simplifying 10:15 and 12:8 by hunting the largest common factor. Pupils write three ratios in simplest form in their copy, then the Class Challenge works equivalents and simplifies on the board.

TEACHING MOVES

1. **Getting Started.** Put 2:3 and 4:6 up, take three hands for 'same' and three for 'different', then say 'let's find out' — crucially, don't confirm who's right. Give five seconds of silent think-time before any hand goes up so the quick pupils don't decide it for everyone.
2. **Watch and Notice.** On the ratio-bars interactive, scale 2:3 → 4:6 → 6:9 and point to how the two bars hold the same relative length each time. For 12:8, deliberately divide by 2 first to show 6:4 still simplifies — that's the trap that proves you need the largest common factor (4), not just any common factor.
3. **Try It Together.** Hand the board over — one pupil multiplies 1:4 by 2, another by 3, class reads each aloud. Reset to 8:12 and ask 'what divides into both?'; accept 2 (giving 4:6) but show on the board that 4:6 still goes smaller, so 4 was the number all along. Watch for anyone changing only one part.

4. **Write the simplest form in your copy.** Pupils write 6:9, 15:10, 24:18 with simplest forms and circle the number they divided both parts by. Glance down the rows — the circled factor is your instant check (3, 5, 6). This is practice, not marking, so keep moving.
5. **Class Challenge.** Brisk board turns: simplify 6:9, 15:10, 24:18, then build three equivalents of 2:5 (×2, ×3, ×4). After each equivalent, have the class confirm it by simplifying it straight back to 2:5. Confirm and move on — don't re-teach each one.
6. **What Did We Notice?.** Ask how simplifying a ratio is like simplifying a fraction. Revoice a strong answer: 'so a ratio behaves just like the top and bottom of a fraction — same operation on both parts.' Listen out for anyone still wanting to divide one part only.

COMMON MISCONCEPTIONS

⚠ A pupil simplifies 12:8 by dividing only the 12 — or divides the two parts by different numbers — producing something like 6:8 and calling it done.

Put both bars up on the interactive and divide one part only, so the class sees the bars no longer match the original comparison. Say it as a rule they can repeat: 'whatever I do to one part, I do to the other.'

⚠ Pupils stop at the first common factor — dividing 12:8 by 2 to get 6:4 and treating that as simplest form.

On the board, take 6:4 and ask 'can this go smaller?' When they spot it halves again, name the lesson: hunt for the LARGEST common factor first so you finish in one step. Show 12:8 ÷ 4 = 3:2 done in one move.

DIFFERENTIATION

EMERGING

- Keep these pupils on doubling and halving only — scale 2:3 up by 2, simplify even:even ratios like 8:12 by 2 — before any odd factors appear.
- On the copybook task, give them the divided-by number written beside each ratio so they only carry out the division, not find the factor.

DEVELOPING

- After the copybook three, hand them 18:24 and 16:20 — bigger numbers where the largest common factor isn't obvious at a glance.
- Ask them to write a ratio of their own that simplifies to 3:4, then a second different one that also simplifies to 3:4.

PROFICIENT

- Narrate a harder Class Challenge variant from the front: simplify 36:24 and 45:30, then ask which other ratios they can invent that share the simplest form 3:2.
- Pose: '3:5 cannot be simplified — why not?' Have them explain what's special about its numbers, linking to fractions already in lowest terms.

Cross-curricular: Tie to cookery/home economics — a pancake recipe of 2 cups flour to 3 eggs scaled up for the whole class is the same ratio, just bigger.

ANSWER KEY

W1: 6

W2: $7 + 21$

Q1: 8

Q2: $5 + 10 + 20$

Q3: 16

Q4: €20 + €30 + €50

EXTENSION SHEET · STRETCH ANSWERS

S1: $15/20 = 3/4$

S2: $18/24 = 3/4$

S3: €24 + €36 + €60

S4: $27/30 = 9/10$

S5: €18 + €27 + €45