

Simplifying fractions

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

To **simplify** (or 'reduce') a fraction, divide the numerator and denominator by their **highest common factor**. The new fraction has the same value but uses smaller numbers.

→ $8/12 = 2/3$ (divide top and bottom by 4).

→ $15/25 = 3/5$ (divide top and bottom by 5).

LESSON ARC

Pose $4/8$ cold and collect three quiet answers before settling anything. On the fraction-strips interactive, stack $4/8$ against $1/2$ so the matching lengths prove the value holds, then name the number that divides into both top and bottom. Pupils write the \div step in their copy for four fractions, underlining the simplest form. Class Challenge runs four on the board — including $7/12$ as a 'already simplest' catch. Comparing fractions is the Student Activity Book hand-off.

TEACHING MOVES

- Getting Started.** Put $4/8$ up and give a silent five seconds before any hands. Take exactly three hands-up answers and write them all on the board without judging — some will say $1/2$, some will leave it as $4/8$. Tell them the strips will settle it next; don't confirm yet.
- Watch and Notice.** Point to the matching lengths on the two strips first so pupils SEE the value holds, then ask 'what number divides into both 4 and 8?' and wait for a pupil to name 4 before you show the $\div 4$. On $6/9$, expect a $\div 2$ attempt — draw out that 9 isn't even. On $12/16$, if a pupil stops at $6/8$ revoice 'still room to go smaller'.
- Try It Together.** Bring a pupil up to shade $4/8$, then $2/4$, then $1/2$ and let the class watch the three reach the same length — name $2/4$ as the halfway step. Then have different pupils build $4/6$ and $10/12$ for the class to simplify aloud. Ask 'which one is simplest and how do you know?' each time.
- Work the Divide Step in Your Copy.** Pupils write the divide-by step underneath each fraction ($4/8 \div 4/4 = 1/2$) and underline the simplest form. Walk the room watching specifically for a too-small factor — $12/16 \div 2 = 6/8$ — and prompt 'is there a bigger number that divides into both?' rather than giving the answer.
- Class Challenge.** Keep it brisk — pupils take turns at the board, check each answer, class confirms, move on. Flag that $6/8$ and $9/12$ both land on $3/4$. On $24/36$ push for the biggest common factor (12) in one go. On $7/12$ press 'how do you know it won't go smaller?' — 7 is prime and shares nothing with 12.
- What Did We Notice?.** Display-only talk. Listen for pupils describing the greatest common factor in their own words — 'the biggest number that goes into both' — and revoice a strong one: 'so spotting the biggest first finishes in one step instead of three'. Head off the belief that you can only divide by 2.

COMMON MISCONCEPTIONS

⚠ Pupils stop too early: $12/16 \div 2 = 6/8$ and call it done, because $6/8$ looks 'smaller' so it feels finished. Build $6/8$ on the strips next to $3/4$ and show they reach the same length — so there was more to take out. Ask 'what number divides into both 6 and 8?' to find the 2 that's still hiding, then go back and divide $12/16$ by 4 in one move.

⚠ Pupils default to dividing by 2 every time, so they get stuck on $6/9$ (where 9 is odd) and decide it 'can't be simplified'.

On the strips, ask whether 9 splits evenly into two — it doesn't. Then ask what DOES go into 9: pupils name 3, and 3 also goes into 6. Make the point out loud that the right factor depends on the numbers, not always 2.

⚠ Pupils assume every fraction must simplify, so they force $7/12$ into a smaller form rather than recognising it's already simplest.

List the numbers that divide into 7 (only 1 and 7) and into 12 (not 7). Build $7/12$ on the strips — nothing else lines up to its length. State the rule: if the only shared factor is 1, it's already simplest.

DIFFERENTIATION

EMERGING

- Stay with halving-only fractions on the strips — $4/8$, $2/4$, $6/8$ — so pupils always divide by 2 while the class tackles $6/9$ and $24/36$.
- Let these pupils shade both strips on the IWB and check the lengths match before writing any \div step; the visual carries the equivalence.

DEVELOPING

- After the copybook four, give $18/24$ and ask for the single biggest divide-step rather than chipping down — can they name 6 first time?
- Ask them to write one fraction of their own that is already in simplest form and explain why it won't go smaller.

PROFICIENT

- Pose: find a fraction equal to $3/4$ where the top is bigger than 20, then prove it simplifies back to $3/4$. Pupils work it in their copy and explain the reverse move.
- Challenge them to explain to the teacher why $7/12$ is simplest using the word 'prime' — building the bridge to greatest common factor.

◦ **Cross-curricular:** Tie to baking in SPHE/home economics — halving a recipe turns $4/8$ of a cup into $1/2$, the same simplest-form move on real quantities.

ANSWER KEY

a) $8/12 = 2/3$ (divide top and bottom by 4).

Q2: $55 (11/12 = 55/60)$

b) $6/10 = 3/5$ (divide top and bottom by 2).

Q3: $18/24 = 3/4$

Q1: 21 ($3/4 = 21/28$)

Q4: $27/30 = 9/10$

EXTENSION SHEET · STRETCH ANSWERS

S1: $15/20 = 3/4$

S3: $15 (3/4 = 15/20)$

S2: $72 (9/10 = 72/80)$