

Finding a fraction of a quantity

CURRICULUM ALIGNMENT

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

NUM.OPS.4 build upon, select and make use of a range of operation strategies.

WHAT THIS LESSON TEACHES

The bottom number of a fraction tells us how many equal parts the whole is split into, so we divide by it first.

→ In $\frac{3}{4}$ of 20, divide 20 by 4 to get one part of 5.

→ Then multiply by the top number: 3 times 5 equals 15.

MODEL THIS ON THE BOARD

FINDING $\frac{3}{4}$ OF 24 SWEETS

- 1 Divide 24 by the bottom number 4 to find one part: 24 divided by 4 equals 6.
- 2 Multiply by the top number 3: 3 times 6 equals 18.
- 3 So $\frac{3}{4}$ of 24 is 18 sweets.

LESSON ARC

Warm up with '3/4 of 20 walk to school' — gather starting ideas, don't solve. Then model on the ratio-bars interactive: split the whole bar by the denominator, name what one part is worth, take the numerator's share. Build the two-step rhythm across four examples including a reverse case. Pupils drive three prompts on the bar, then show both steps in copybook. Class Challenge runs shopping and time contexts plus a reverse stretch on the board.

TEACHING MOVES

1. **Getting Started.** Give five seconds of silent think-time, then take three hands — not open call-outs. Listen for 'split 20 into 4 groups'; that's the move the whole lesson turns on. Don't confirm or work it out — just gather and pivot to the model.
2. **Watch and Notice.** Say the same rhythm every example: 'divide by the bottom for one part, multiply by the top for how many we want.' On $\frac{5}{8}$ of 40, take the prediction first — $\frac{5}{8}$ is more than half, so the answer must beat 20 — before the arithmetic confirms it. On the reverse example, point to the two shaded parts worth 12 and ask what one part is worth.
3. **Try It Together.** Reset the bar for each prompt so it re-splits (24 into 4, 35 into 5, 48 into 6). Before anyone touches the board, ask the two set questions aloud: 'how many parts?' and 'what is one part worth?' Rotate three pupils to drive. If someone multiplies before dividing, revoice: 'first find one part, then take the parts we want.'
4. **Show the Two Steps in Your Copy.** Walk the room glancing that both steps are written, not just a boxed answer. Nudge anyone who wrote only the total to add the divide step underneath. This is practice, not marking — keep moving.
5. **Class Challenge.** Keep board work brisk — pupils take turns, class confirms each answer, then move on. For the €30 and 48-minute bars the interactive shows the proportion, so say the one-part value aloud as you build (€10, then 8 minutes). Let a confident pupil lead the reverse stretch.

6. What Did We Notice?. Listen for pupils naming 'one part' as the key that unlocks everything. Revoice a strong answer: 'once we know what one part is worth, we can take any number of parts we like.' Pull one real example — a third off a price, sharing sweets, two thirds of a bag of flour.

COMMON MISCONCEPTIONS

⚠ Pupils grab the numerator first — for $\frac{3}{4}$ of 20 they do $3 \times 20 = 60$, or multiply then divide in a muddle.

Stop and rebuild on the ratio bar: split 20 into 4 parts before anything is multiplied. Revoice the fixed order — 'one part first, then take the parts we want.' Have the pupil point to one part and say its value before touching the top number.

⚠ On the reverse problem, pupils treat the given 12 as the whole class rather than as two of the five parts.

On the bar, shade only two parts and label them 12, leaving three parts blank. Ask 'is the whole bar shaded?' — the gap makes it visible that 12 isn't the whole. Then work back: one part is 6, five parts is 30.

⚠ Pupils divide 48 by 5 for $\frac{5}{6}$ of 48 — they use the numerator, not the denominator, as the number to split by.

Circle the bottom number on the board before dividing every time: 'the bottom tells us how many equal parts.' On the bar, count the parts it splits into (6) and check it matches the denominator, not the top number.

DIFFERENTIATION

EMERGING

- Stay with unit fractions on the bar first — $\frac{1}{4}$ of 20, $\frac{1}{5}$ of 35 — so pupils master 'divide for one part' before adding the multiply step.
- Pre-split the bar into the right number of parts on the IWB so pupils only find the value of one part, not decide the part-count.

DEVELOPING

- After the copybook page, ask pupils to check by a different route: does $\frac{3}{4}$ of 20 plus $\frac{1}{4}$ of 20 come back to 20?
- Swap the numbers so one part isn't a whole number yet stays friendly — $\frac{2}{3}$ of 15, $\frac{3}{4}$ of 28 — and ask which totals surprised them.

PROFICIENT

- Give fast finishers the reverse stretch worded harder: ' $\frac{5}{8}$ of a bag is 30 sweets — how many in the full bag?' No bar; they explain each step aloud.
- Pose a two-fraction total on the board: 'if $\frac{2}{5}$ of a class are boys and there are 18 girls, how big is the class?' — let them reason it before any method is named.

✓ **Cross-curricular:** Tie to money and shopping — pupils find $\frac{1}{3}$ off a marked price in euro (e.g. $\frac{1}{3}$ off €24) and give the sale price.

ANSWER KEY

Scaffold: visual check on the page

Q1: 15 apples

Q2: 20 euro

Q3: 14 biscuits

a) Always : The denominator always tells you the number of equal parts to divide by first.

b) Never : $\frac{3}{4}$ is less than one whole, so $\frac{3}{4}$ of 20 is 15, which is less than 20.

c) Always : This order always works for any proper fraction of a quantity.

d) Never : Different numerators give different results even with the same whole.

EXTENSION SHEET · STRETCH ANSWERS

S1: 72

S2: 57

S3: 77

S4: 8

S5: 32