

Addition and subtraction of decimals to thousandths

CURRICULUM ALIGNMENT

NUM.OPS.4

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

NUM.PVT.4

investigate how decimals and percentages (and fractions) can be compared, ordered and expressed in related terms.

INTERACTIVES

Column Addition · display, explore

Column Subtraction · challenge, display

WHAT THIS LESSON TEACHES

When adding or subtracting decimals to thousandths, line up the decimal points so tenths, hundredths and thousandths match in columns.

→ $4 + 0.275$ lines up as $3.400 + 0.275$.

→ $2 - 3.485$ lines up as $7.200 - 3.485$.

MODEL THIS ON THE BOARD

LINE UP THE POINTS AND ADD

- 1 Write 5.6 as 5.600 to match 2.340.
- 2 **Align** the decimal points in a column.
- 3 Add from the thousandths column right to left.

LESSON ARC

Open with $3.4 + 0.275$ on the IWB and ask whether the 4 sits above the 5 — let pupils want to right-align, then don't correct yet. Walk four worked examples on the column-grid, each pivoting on filling trailing zeros so every column has a digit. Pupils rewrite three sums in their copy with points lined up. The Class Challenge tackles borrowing through zeros at the board before the Student Activity Book practice.

TEACHING MOVES

1. **Getting Started.** Put $3.4 + 0.275$ up and give five seconds of silent think-time before any hands. Take two or three hands-up answers only. You want to hear the wrong idea — 'put the 4 above the 5' — so let it sit, say 'let's see what the columns tell us', and move on without correcting.
2. **Watch and Notice.** On the column-grid, point at the empty hundredths and thousandths in 3.4 and fill them with zeros — this answers the hook directly. On $12.06 + 5.349$, pause at the carry and ask 'where does the little 1 go?' to confirm it lands above the tenths. Save $10.0 - 4.085$ for last and let the borrow travel through the zeros slowly before revealing the answer.
3. **Try It Together.** Call a pupil to the board for $5.6 + 2.34$ and refuse to let them start adding until the points are lined up and 5.6 is filled to 5.60. The class watches and calls out any missing zero. Check the answer's decimal point sits directly under the points above — that's the slip to catch.
4. **Line Them Up in Your Copy.** Pupils rewrite the three calculations in their copy with points aligned and gaps zero-filled before working them. Walk the room glancing for two things only — are the points lined up, are the gaps filled. Nudge crooked columns straight; don't mark individual answers.
5. **Class Challenge.** Keep it brisk — a pupil works each subtraction at the board, the class predicts then checks. Before $15.0 - 6.074$, have the whole class predict the answer so the borrow-through-zeros

doesn't ambush anyone. For the 'find the missing decimal' one, let the class reason it as $9.5 - 3.275 = 6.225$ and then verify.

6. **What Did We Notice?** Push for the place-value reason — a missing zero means a column has no digit, so the wrong digits get added. Re-voice a strong answer: 'so the zeros keep every column honest.' Use this to head off the right-aligning habit one last time.

COMMON MISCONCEPTIONS

⚠ Pupils right-align the digits like whole numbers, so in $3.4 + 0.275$ they line the 4 under the 5 and add tenths to thousandths.

Rebuild it on the column-grid with the decimal points stacked. Show the 4 is a tenth and the 5 is a thousandth — different columns can't be added. Make them fill 3.4 out to 3.400 first, every time, before adding.

⚠ Pupils stall on $10.0 - 4.085$ or $15.0 - 6.074$ because they have to borrow across two or three zeros and don't know where to start.

Have the class predict the answer before anyone works it. Then narrate the borrow travelling one column at a time across the zeros on the grid — slow it right down so they watch each zero become a 9 or 10.

⚠ Pupils get the digits right but float the answer's decimal point — they pop it anywhere or drop it.

Draw a straight vertical line down through every decimal point on the board, including the answer line. The point in the answer sits directly under the points above it, full stop.

DIFFERENTIATION

EMERGING

- Give the decimal column-grid sheet with the points and place-value headings already marked so pupils only place digits, never line columns up from scratch.
- Stay with two-decimal-place numbers (e.g. $4.7 + 0.26$) in their copy while the class works to thousandths, keeping the same fill-with-zeros first move.

DEVELOPING

- After the copybook three, add a chain: $6.08 + 3.5$, then subtract 0.265 from the answer — does the lining-up rule still hold each time?
- Pose a missing-digit variant: $4.7 + 0.2\square5 = 4.965$, what's the hidden digit and how do you know?

PROFICIENT

- Narrate a harder board variant for fast finishers — $20.0 - 8.0375$, with the borrow travelling through four zeros — or pull them ahead into the Student Activity Book page while the class checks the Class Challenge.

✚ **Cross-curricular:** Tie to money in maths-for-life — total two shop prices like €3.40 and €0.27, then check why euro amounts only ever need two decimal places.

ANSWER KEY

a) 7.200 - 3.485

b) 15.000 - 6.074

c) 9.500 - 3.275

Q1: 3.675 kg

Q2: 7.94 litres

Q3: 6.55

Q4: 4.743 kg

Q5: 8.926 euros

Q6: 6.225 litres

a) **Always** — The rule requires points directly above each other for correct place values.

b) **Never** — Last digits may be different place values so the sum or difference will be wrong.

c) **Always** — Zeros fill empty places so every column has a digit to add or subtract.

d) **Sometimes** — It depends on whether the top digit is smaller than the bottom in those places.

EXTENSION SHEET · STRETCH ANSWERS

S1: 94.393

S2: 108.092

S3: 78.131

S4: 69.222

S5: 50.646