

Lesson 25 **NUMBER****Multiplying two two-digit numbers**

CURRICULUM ALIGNMENT

NUM.OPS.4

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

INTERACTIVES **Area Model** · challenge, display, explore

WHAT THIS LESSON TEACHES

To multiply two two-digit numbers, split each into tens and units so the product breaks into four easier multiplications. Add those four partial products to find the total.

→ 23×14 becomes $(20 + 3) \times (10 + 4)$

→ $20 \times 10 + 20 \times 4 + 3 \times 10 + 3 \times 4 = 200 + 80 + 30 + 12 = 322$

MODEL THIS ON THE BOARD

AREA MODEL FOR 42×36

- 1 Split 42 into **40 + 2** and 36 into **30 + 6**.
- 2 Find the four products: $40 \times 30 = \mathbf{1200}$, $40 \times 6 = \mathbf{240}$, $2 \times 30 = \mathbf{60}$, $2 \times 6 = \mathbf{12}$.
- 3 Line them up by place value and add: $1200 + 240 + 60 + 12 = \mathbf{1512}$.

LESSON ARC

Open with 23×14 and take three hands-up estimates — bank them as an end-of-lesson check. Split the area-model grid into four boxes on the IWB and name each partial (200, 80, 30, 12), stressing that 200 is hundreds and 12 is ones. Pupils sketch the same grid in their copies. The Class Challenge bank drives whole-class practice; the maths-talk wrap pins down why the partials must align by place value.

TEACHING MOVES

1. **Getting Started.** Take three hands-up estimates for 23×14 , not open call-outs, and write them in a corner of the board to revisit at the end. If a pupil offers 'just do 2×1 and 3×4 ', note it aloud without correcting — the four-box model will expose why that misses most of the answer.
2. **Watch and Notice.** Reveal one example at a time on the area-model interactive — don't show all three at once. On 35×27 hold the reveal and ask 'which box is biggest?', take two answers, then show the 30×20 corner. Save 56×48 as the pay-off where every box is large, and say the columns aloud as you total.
3. **Try It Together.** One pupil drives the partitions of 42×36 at the board while a different pupil calls out each of the four partials. Watch for 40×30 read as 120 — revoice as 'four tens times three tens is twelve hundreds.' Compare the 1,512 total against the column-shorthand panel so the two methods agree.
4. **Sketch the Grid in Your Copy.** Pupils sketch the 2×2 grid for 23×14 on squared paper and write each sub-product in its box. Walk the room glancing for boxes labelled with the wrong tens and ones, and totals that don't line up — no individual marking, this is whole-class practice.
5. **Class Challenge.** Keep the board brisk: in the 8 minutes, lock in 28×23 and 47×35 , with 64×19 and 87×96 as stretch only if pace allows. Watch for the ones $\times$ tens box done as ones $\times$ ones (3×3 instead of 3×30 in 28×23). If you reach 87×96 , slow right down for column alignment — a stray zero there costs the whole answer.
6. **What Did We Notice?.** Ask why the partials of 47×35 must line up by place value before adding. Revoice a strong answer: 'the 1,200 lives in the hundreds, so it sits under the hundreds, not next to the 12.' Head off the idea that you add the boxes in the order they appear — position, not order, decides the column.

COMMON MISCONCEPTIONS

⚠ Pupils do just 2×1 and 3×4 for 23×14 and offer 8 or 62 — they multiply the digits in place rather than partitioning the whole numbers.

Return to their answer against the four-box grid: the 20×10 box alone is 200, far bigger than their guess. Point out that the digit-only method throws away the tens $\times$ tens box that holds most of the answer.

⚠ Pupils multiply 40×30 as 120 or 3×30 as the ones-only $3 \times 3 = 9$ — they drop a zero from a tens $\times$ tens or ones $\times$ tens box.

Revoice in place-value words: 'four tens times three tens is twelve hundreds.' Have the pupil name each factor as tens before multiplying, and check the box against the column-shorthand panel.

⚠ Pupils add the four partials in the order the boxes appear, writing 200, 80, 30, 12 in a row and adding as if all ones.

Stack the partials in a place-value column on the board — 200 under hundreds, 12 under ones — and show the class the difference between the lined-up total and the run-on row. The column position, not the order, decides where each partial lands.

DIFFERENTIATION

EMERGING

- Pre-draw the empty 2×2 grid with the tens and ones labels already on the edges so pupils only fill the four products, not build the structure.
- Stay with one small factor — e.g. 23×12 — so two of the four boxes are easy ones-digit products while the class moves to bigger numbers.

DEVELOPING

- After the copybook grid, ask pupils to redo 23×14 as 14×23 (swap top and side) and confirm the four boxes give the same total.
- Give a missing-box variant: three partials shown (200, 80, 12), ask which box is missing and what it's worth.

PROFICIENT

- Pose 87×96 from the stretch pair and ask pupils to predict, before totalling, roughly how big the answer is by rounding to 90×100 — then check the four-partial total against that estimate.
- Ask: could you use the same four-box idea to multiply a three-digit by a two-digit number? Let them try one on squared paper and describe how many boxes it needs.

✂ **Cross-curricular:** Tie to Geography — pupils find the area of a classroom or GAA pitch in metres using the same partition-into-boxes idea for the two side lengths.

ANSWER KEY

a) $200 + 80 + 30 + 12 = 322$

b) $400 + 60 + 160 + 24 = 644$

c) $1200 + 200 + 210 + 35 = 1645$

Q1: 986 desks

Q2: 5600 pencils

Q3: 450 trays

a) **Always** : Each tens and units pair multiplies once, giving four products every time.

b) **Always** : Addition is commutative so the total is the same whichever order you choose.

c) **Always** : The tens times tens part (like $20 \times 10 = 200$) is always a multiple of 100.

d) **Never** : Place value alignment is essential or the hundreds, tens and units will be added incorrectly.

EXTENSION SHEET · STRETCH ANSWERS

S1: 7479

S2: 600

S3: 3475

S4: 1757

S5: €2,241