

Lesson 23 **NUMBER****Multiplying a 2-digit number by 1 digit: partition first**

CURRICULUM ALIGNMENT

NUM.OPS.3

understand and apply flexibly the four operations; and the relationships between operations.

NUM.PVT.3

explore equivalent numerical expressions of numbers using the base ten system.

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

WHAT THIS LESSON TEACHES

To multiply a two-digit number by one digit, partition the two-digit number into tens and units first. Multiply each part by the one-digit number, then add the two part-products.

→ 24 splits into 20 and 4. For 24×3 the tens part-product is $20 \times 3 = 60$.

→ $60 + 12 = 72$, so $24 \times 3 = 72$.

MODEL THIS ON THE BOARD

PARTITION 24×3

- 1 Split 24 into tens and units: **20** and **4**.
- 2 Tens part-product: **$20 \times 3 = 60$** .
- 3 Units part-product: **$4 \times 3 = 12$** .
- 4 Add the parts: **$60 + 12 = 72$** .

DISCUSSION STARTER

REFLECT Did splitting into tens and units make the multiply step feel easier? Why?

LESSON ARC

Open with a quick mental estimate of 23×3 , then name the split of 23 into 20 and 3 as partitioning. Build 14×2 on the area-model interactive — point at the tens sub-rectangle, then the units one, and add the two areas. Pupils take turns building 15×2 , 22×3 and 24×4 at the board, then work 24×3 and 15×3 in their copy with a tens line and a units line. Student Activity Book follows.

TEACHING MOVES

1. **Getting Started.** Ask for a quiet estimate of 23×3 , then take two or three raised-hand guesses — not open call-outs. Draw out splitting 23 into 20 + 3 and name it 'partitioning'. Hold back the actual answer; the split is the hook, not the product.
2. **Watch and Notice.** Build 14×2 on the area-model interactive: point at the tens sub-rectangle ($10 \times 2 = 20$), then the units one ($4 \times 2 = 8$), then add. Before revealing 16×4 , ask 'which of these will make the units part jump past ten?' — take two hands, then reveal. Say the $6 \times 4 = 24$ units part slowly: we still just add it on.
3. **Try It Together.** A pupil sets 15×2 on the model while the class agrees both part-areas aloud before anyone adds. Revoice with the round's own numbers: 'the tens part is worth sixty, the units part six, together sixty-six.' Reset and rebuild 22×3 , then 24×4 , one at a time.
4. **Work It in Your Copy.** Pupils work 24×3 and 15×3 with a tens line and a units line under each fact. Walk the room glancing for two product lines, not one — the single-line pupils are the ones dropping the units part.

5. **Class Challenge.** Brisk board turns through 13×2 , 21×4 , 17×3 , 26×3 — class confirms each before moving on. For 17×3 and 26×3 the units part beats ten, so ask 'is the units part bigger than a ten?' then 'we still just add it on.' Don't re-explain the method each time; this is consolidation.
6. **What Did We Notice?.** Ask why the split is safe and what breaks if you forget the units part. Revoice a strong answer: 'a rectangle is two smaller rectangles, and its whole area is just the two part-areas added.' Press the class on exactly what the units part contributes.

COMMON MISCONCEPTIONS

⚠ A pupil works 24×3 as $20 \times 3 = 60$ and stops there — they multiply the tens part and forget the units part entirely.

Go back to the area model and shade only the tens sub-rectangle. Ask 'is this the whole rectangle?' The unshaded units strip is the missing part-product — have the pupil read its area ($4 \times 3 = 12$) and add it on.

⚠ When the units part goes past ten (17×3 , units $7 \times 3 = 21$), pupils treat it as an error and try to 'carry' or drop it rather than just adding it on.

Keep both areas visible on the model. Say slowly: the units part is worth twenty-one, that's fine — it's still one of the two areas we add. $30 + 21 = 51$. Nothing special happens because it passed ten.

DIFFERENTIATION

EMERGING

- Stay with tidy units parts (13×2 , 21×4) at the board while the class meets the past-ten cases; these pupils build the same facts on the model with the tens sub-rectangle pre-shaded so they only find the units part.
- In the copy, work just 15×3 with the teacher table, writing the tens line and units line together beat by beat.

DEVELOPING

- After the copy work, swap the units digit — turn 24×3 into 27×3 and ask which part-product changed and by how much.
- Give a missing-part variant: $20 \times 3 = 60$, total is 72, so what was the units part-product? Work back to the original fact.

PROFICIENT

- Pose 34×3 on the same model — the method holds when the tens part crosses one hundred. Ask them to predict the tens part-area before they build it, then justify in their copy.
- Ask them to explain to the class, in one sentence, why splitting into three parts (e.g. hundreds, tens, units) would work for a three-digit number — reasoning ahead, no new manipulative.

✂ **Cross-curricular:** Tie to Geography — partition a county's dimensions (e.g. a 23 km by 3 km strip) and use the area model to find the area in square kilometres.

ANSWER KEY

a) 45

b) 72

c) 84

Q1: 45 apples

Q2: 26 grapes

Q3: 48 buns

Q4: 51 carrots

Spot: Sean added the units digit 3 instead of the product
9. Partition correctly: $20 \times 3 = 60$ and $3 \times 3 = 9$, then $60 + 9 = 69$.