Lesson 17 NUMBER

Mental addition strategies — partitioning and compensating

CURRICULUM ALIGNMENT

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

INTERACTIVES Number Line Jumps · display, explore | Fact Race · challenge

WHAT THIS LESSON TEACHES

Two strategies make mental addition fast: **partitioning** (split each number into tens and units) and **compensating** (round one number, then adjust).

→ Partition: **47 + 36** → (40+30) + (7+6) = 70 + 13 = **83**.

→ Compensate: **48 + 36** → 50 + 36 = 86, then take 2 back: **84**.

LESSON ARC

Open with 47 + 38 cold on the IWB — five seconds quiet think, then collect three different mental routes without judging. Walk four worked examples on the empty-number-line interactive, ending on 235 + 198 to land 'the numbers decide the strategy'. Pupils try 38 + 27 three ways at the board, then work 47 + 38 and 235 + 198 three ways each in their copy. Class Challenge runs the bonds-to-1000 fact-race bank.

TEACHING MOVES

1. **Getting Started.** Write 47 + 38 large on the IWB and freeze. Five silent seconds, no hands. Then ask 'how did you do it?' not 'what's the answer?' Park three or four different routes side by side without ranking them — pupils need to see the same answer arrive different ways.
2. **Watch and Notice.** Two minutes each on Examples 1–3, three minutes on Example 4. Trace the back-jump under the line on Example 2 — that's where pupils slip. On Example 4 (235 + 198), pause and ask: 'would partitioning be sensible here?' Let the class count the jumps — three for partition, two for compensate. That's the punchline.
3. **Try It Together.** Three pupils up in turn, one per strategy. Between turns, five-second silent think for the watching class — ask which strategy they'd reach for next, and why, and take one answer, then call the next pupil up. Stops the back two rows from drifting.
4. **Work it three ways in your copy.** Six labelled mini-solutions in six minutes. Walk the row checking two things: the take-back jump in compensating matches the rounding-up amount, and the bridge jump lands on a round number. Nudge any pupil still on 47 + 38 at four minutes — 235 + 198 is the row that earns the lesson.
5. **Class Challenge.** Keep it brisk — read, nominate, type, next. Don't re-teach the strategies here; pupils will see this same bank again tonight at home. On Round 4, listen for a pupil saying '400 needs 600 more to get to 1000' — re-voice that aloud so the rest of the class hears partitioning being used in the wild.
6. **What Did We Notice?.** Two or three voices per question, no writing. Re-voice the heart of it: 'when one number sits just below a round hundred, compensating wins — one big jump, one tiny back-jump.' Listen for pupils who can say why the numbers decide — that's the objective, not the answer.

COMMON MISCONCEPTIONS

⚠ Pupils compensate by jumping +40 to land on 87 but then forget the take-back, writing 47 + 38 = 87.

Catch it on the empty number line. Re-voice: 'you added two too many — show me where the two goes back.' Have the pupil draw the back-arc themselves and say the size of it aloud. The back-jump must equal the rounding-up amount; make pupils name both numbers out loud.

⚠ Pupils bridge by jumping +3 from 47 to land on 50, then add the full 38 again — getting 88 instead of 85.

Stop and rebuild on the number line. 'You used 3 of the 38 to get to 50 — how much of the 38 is left?' Make the split visible: 38 = 3 + 35. The bridge jump uses part of the second number, not all of it.

⚠ Pupils pick partitioning for 235 + 198 because it's their default, then grind through three jumps when compensating would take two.

Don't ban partitioning — let the pupil finish, then put compensating beside it on the number line. Count jumps aloud: three versus two. Ask: 'which numbers are these strategies good for?' The point isn't that one strategy is right, it's that the numbers decide.

DIFFERENTIATION

EMERGING

- Stay with two-digit examples only in the copybook — 47 + 38 three ways is enough; don't push to 235 + 198 if the take-back jump in compensating isn't secure yet.
- Pre-draw the empty number line in their copy with the start number already marked, so pupils only need to draw the jump arcs, not invent the structure.

DEVELOPING

- After 235 + 198 in the copy, ask: which strategy would you reach for if it were 235 + 202? Why does shifting one number across the hundred change the cleanest choice?
- Pose 47 + 38 + 25 and ask pupils to mentally chain the strategies — partition the first two, then bridge through the next ten.

PROFICIENT

- Direct fast finishers to the extension bank on their device while you circulate the room.
- Pose: invent a two-digit-plus-two-digit sum where compensating is clearly the worst choice. Explain to the pupil beside you why.

Cross-curricular: Tie to PE — pupils mentally add lap distances (e.g. 235 m + 198 m around the yard) and explain which strategy they reached for.

ANSWER KEY

a) 47 + 38 = 85 (47 → 77 → 85).

b) 48 + 36 = 84 (48 → 88 via +40; 88 → 84 via −4 — careful, this should be 48 + 40 = 88 then take 4 back not 2. Better: 48 + 36 → round 36 up to 40, gives 88; take 4 back = 84).

c) 67 + 25 = 92 (67 +3 = 70; 70 + 22 = 92).

Q1: 1043

Q2: 819

Q3: 14024

Q4: 10296

EXTENSION SHEET · STRETCH ANSWERS

S1: 11914

S2: 1662

S3: 1398