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.

ALG.PRR.4a identify, explain and apply generalisations, including properties of operations, mathematical models and patterns.

INTERACTIVES Number Line Jumps · challenge, display, explore

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

Put 47 + 38 on the board with no columns and take three quiet-think routes before naming anything. On the empty-number-line interactive, walk all three as jump arcs — partition (+30, +8), compensate (+40, −2), bridge (+3 to 50, +35). The class then drives 56 + 27 live, choosing the strategy before a pupil draws. Pupils work 47 + 38 three ways in their copy, then the Class Challenge pushes into three-digit sums where compensating wins.

TEACHING MOVES

1. **Getting Started.** Hold 47 + 38 up with no paper allowed and give a silent five-count before any hands. Take exactly three hands, not call-outs, and listen for the different routes — note who adds 30 first and who rounds to 40, because you'll name those as strategies next. Don't reveal 85 yet.
2. **Watch and Notice.** Draw each route as jump arcs on the number-line interactive, one at a time, and point to 85 landing the same place every time. On 235 + 198, stop and ask 'why was adding 200 easier than adding 198?' — that's the moment compensating earns its keep.
3. **Try It Together.** Let the class agree the strategy for 56 + 27 BEFORE a pupil touches the board. Some partition (+20, +7), some bridge to 60 (+4, +23) — let both run, then revoice 'different routes, same answer of 83.' Clear the line and take a fresh class-called sum if time allows.
4. **Work It Three Ways in Your Copy.** Pupils write 47 + 38 three ways down the page with the jumps beside each. Walk the room checking all three land on 85 — if one doesn't, the jumps don't yet sum to 38, so point at that route and ask them to total their own jumps.
5. **Class Challenge.** Pupils take turns at the board working the four sums for fewest jumps; class confirms each before moving on. Keep it brisk. If someone reaches the target in extra jumps, accept it, then ask the class for a shorter route rather than re-explaining the strategy.
6. **What Did We Notice?.** Pose the 'partitioning is always best' versus 'compensating wins for 235 + 198' disagreement and make pupils settle it with the numbers, not a favourite. Revoice: 'so the numbers decide — when one addend sits just under a round ten or hundred, compensate.'

COMMON MISCONCEPTIONS

⚠ Pupils crown one strategy 'the best' and use partitioning for everything, including 235 + 198 where they slog through +100, +90, +8.

Run 235 + 198 both ways on the number line side by side — partition's four arcs against compensate's two (+200, −2). Let the class count the jumps. The picture, not your word, makes the case that the numbers pick the strategy.

⚠ When compensating, pupils add the round number but forget to jump back, leaving 47 + 38 as 87, or they jump back the wrong amount.

On the interactive, draw the +40 overshoot to 87 deliberately, then ask 'how far past did we go?' Let them spot it's 2 too far because 38 is 2 less than 40. Make the take-back arc its own clear backward jump.

DIFFERENTIATION

EMERGING

- Stick to partitioning only for these pupils — one strategy done well beats three half-formed. Pre-draw the empty number line in their copy so they place arcs, not the whole structure.
- Stay with two-digit sums when the rest move to 235 + 198; the three-digit row is teacher-supported at your table.

DEVELOPING

- After the copybook, ask which of their three routes for 47 + 38 used the fewest jumps and why — push them to justify, not just complete.
- Hand them 268 + 197 early and ask them to predict the fewest jumps before drawing anything.

PROFICIENT

- During Class Challenge, narrate a harder variant from the front: 396 + 248. Ask them to find a compensating route AND a bridging route, then argue which the numbers favour.
- Pose: 'invent an addition where partitioning beats compensating' — they have to reason backwards about what kind of numbers each strategy suits.

Cross-curricular: Tie to geography — pupils add the distances between two pairs of Irish towns on a road map and pick the quickest mental strategy for each pair.

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