

Mental strategies for addition and subtraction

CURRICULUM ALIGNMENT

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

INTERACTIVES Number Line Jumps · challenge, display, explore

WHAT THIS LESSON TEACHES

Good mental strategies make addition and subtraction quick: **round and adjust, count on, or use known number bonds.**

$$\rightarrow 299 + 156 \rightarrow 300 + 156 - 1 = 455.$$

$$\rightarrow 503 - 198 \rightarrow 503 - 200 + 2 = 305.$$

MODEL THIS ON THE BOARD

WORK OUT $397 + 248$ MENTALLY

- 1 Round 397 up to **400** (that's 3 too many).
- 2 $400 + 248 = 648$.
- 3 Take back the 3: $648 - 3 = 645$.

LESSON ARC

Open with $1,998 + 2,005$ as a head-only puzzle and harvest the rounding move pupils already use. On the empty-number-line interactive, model compensation ($4,997 + 386$), round-and-adjust ($8,012 - 1,995$) and partition ($3,450 + 2,780$), tracing arcs. Pupils try three together at the board, then note strategy names beside three sums in their copy. Class Challenge: bridge to 10,000 in fewest jumps. Maths-talk weighs mental versus column method.

TEACHING MOVES

1. **Getting Started.** Pose $1,998 + 2,005$, give five seconds of silent think-time, then take three hands — no call-outs. Listen for pupils who rounded to 2,000 and adjusted; re-voice that move aloud as the hook: 'you made it tidy first.'
2. **Watch and Notice.** Trace each arc on the number line and say the strategy name as you point to its header. On $8,012 - 1,995$, stress the wording 'we come forward 5 because we took 5 too many' and draw the $-2,000$ leftward but the $+5$ clearly rightward — this is the slip-point.
3. **Try It Together.** Before each calculation, ask the class which strategy fits — is a number near a tidy figure, or do we break it apart? Make pupils say the first jump aloud before anyone draws. Only $5,996 + 247$ is on the interactive; hand-draw a line beside it for the other two.
4. **Note Your Strategy in Your Copy.** Leave the three strategy names visible on the board. Walk the room glancing at whether the named strategy actually matches the working — flag any $8,012 - 1,995$ where the $+5$ went the wrong way. No marking; this is practice, not assessment.
5. **Class Challenge.** Keep it brisk — pupils take turns at the board reaching 10,000 in fewest jumps, class confirms each before moving on. Push the route-plan question first: 'which tidy number do we bridge to before we land on 10,000?' Don't re-explain each one.

6. **What Did We Notice?**. Steer pupils off 'which is always faster' towards 'which fits these numbers'. Re-voice a strong answer: mental wins when a number sits close to a tidy figure; columns win when nothing rounds neatly.

COMMON MISCONCEPTIONS

⚠ On $8,012 - 1,995$, pupils subtract the adjustment too: they do $-2,000$ then -5 , landing on $6,007$ instead of $6,017$.

Stop and re-trace on the number line. 'We took away $2,000$, but we only owed $1,995$ — we took 5 too many, so we hand 5 back.' Draw the $-2,000$ jump leftward, then the $+5$ jump rightward (forward) and say 'forward' aloud as you draw it.

⚠ Pupils use compensation but forget to add the leftover: on $4,997 + 386$ they jump $+3$ to $5,000$ and stop, giving $5,000$ rather than carrying the 383 on.

Point to the strip of 386 still unspent on the board. 'You've only spent 3 of your 386 — where do the other 383 go?' Have them draw the second arc before reading any answer.

DIFFERENTIATION

EMERGING

- Stick to compensation only on the number line — one strategy at a time — and keep the second addend small ($4,997 + 25$) so the leftover jump is manageable.
- Pre-label the tidy bridging number ($5,000, 6,000, 10,000$) on the line so pupils only have to size the jumps, not spot the target.

DEVELOPING

- After the copybook three, hand them a calculation that could go two ways (e.g. $6,005 - 2,998$) and ask them to solve it by two different strategies and say which felt cleaner.
- On the $10,000$ challenge, ask them to beat their own jump-count — can they reach it in two jumps instead of three?

PROFICIENT

- Narrate a harder live variant at the board: $12,003 - 4,997$, where both compensation and round-and-adjust are tempting — ask them to justify their pick aloud to the class before drawing.
- Pose: write a starting number that reaches $10,000$ in exactly one jump, and one that genuinely needs three. Explain what makes the difference.

◦ **Cross-curricular:** Tie to Geography — pupils estimate distances between Irish towns (e.g. Dublin to Galway ≈ 208 km) and add legs of a journey using round-and-adjust.

ANSWER KEY

Warm-up: a) 96 b) 53 c) 124 d) 167

Q1: 272

Q3: 1499

Q2: 1662

Q4: 11914

EXTENSION SHEET · STRETCH ANSWERS

S1: 5142

S4: 5644

S2: 14024

S5: 1398

S3: 10296