

Finding the missing number ($\square + 4 = 10$)

CURRICULUM ALIGNMENT

ALG.EXP.3

represent and express problems with known and unknown values in different ways to include the use of appropriate letter-symbols or words.

NUM.OPS.3

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

INTERACTIVES (Number Bonds · challenge, display, explore)

WHAT THIS LESSON TEACHES

A box in a number sentence stands for one missing number we have to find. Use the whole and the known part to work out the hidden number so both sides match.

→ In $\square + 4 = 10$ the box hides 6.

→ In $\square - 2 = 6$ the box hides 8.

MODEL THIS ON THE BOARD

CUBES HIDING IN THE BOX

- 1 Look at the level balance: one pan holds **10** cubes and the other holds **4** cubes plus a box.
- 2 The beam is level so both pans are equal: $\square + 4 = 10$.
- 3 The whole is **10** and one part is **4**, so the missing part is $10 - 4$.
- 4 The box hides **6** cubes. Check: $6 + 4 = 10$.

DISCUSSION STARTER

REFLECT When a box is missing, do you count on, take away, or picture the balance?

LESSON ARC

Open with $\square + 4 = 10$ on the IWB and take three hands-up guesses without confirming. Move to the part-part-whole bond interactive: seat the whole and known part, then work the missing part, saving $\square - 2 = 6$ as the twist where the box is the whole, not a part. Pupils solve two sums in their copybook and write the full true sentence under each. Class Challenge is the practice bank, ending on a hidden-whole bond.

TEACHING MOVES

1. **Getting Started.** Show $\square + 4 = 10$, give five seconds of silent think-time, then take exactly three hands-up answers — not open call-outs. Don't confirm; just listen for who counts on from 4 versus who already knows the bond to 10.
2. **Watch and Notice.** On the bond interactive, point at the whole first, then the known part, and ask how many the empty circle needs. Slow right down on $\square - 2 = 6$: read it as 'a whole, take away 2, leaves 6', seat 6 and 2 in the two part circles first, and only then ask what fills the whole. Make the class notice the box has moved.
3. **Try It Together.** Reset the bond for each sum; pupils take turns at the board stepping the empty part up until the whole lights up. Flag that $\square + 4 = 9$, $\square + 2 = 7$ and $\square + 6 = 11$ all give 5 even as the whole grows — a genuine 'why?' moment. Hold out for a pupil to spot that $\square - 4 = 3$ hides the whole before you name it.

4. **Solve It in Your Copy.** Pupils solve $\square + 5 = 12$ and $\square + 6 = 14$ in copybook, writing the full true sentence under each box. Walk the room glancing for pupils who stop at the box — send them back to write and read the whole sentence aloud to check.
5. **Class Challenge.** Brisk practice — pupils take turns at the board, tap Check, and the class confirms before moving on. Before each bond ask the caller the one question that carries the lesson: 'is the box a part, or the whole?' The final hidden-whole bond (parts 8 and 3) is the one to slow for.
6. **What Did We Notice?.** Ask 'nobody told you if you were right — how do you check it yourself?' Listen for pupils describing putting the answer back in and reading the sentence. Revoice a strong one: 'so you check by seeing whether the two parts fill the whole exactly.'

COMMON MISCONCEPTIONS

⚠ On $\square - 2 = 6$, pupils put 4 in the box — they treat the box as a missing part and subtract, ignoring that the box is the whole here.

Read it aloud together as 'a whole, take away 2, leaves 6', then seat 6 and 2 into the two part circles of the bond first. Only once both parts are visible ask what the whole must be. The box's position in the diagram, not the sign, tells them it's the whole.

⚠ When the whole and known part both grow ($\square + 4 = 9$, then $\square + 6 = 11$), pupils assume the missing number must grow too and are surprised it stays 5.

Line the three solved bonds up on the board and count the empty part on each. Ask 'the whole got bigger and the known part got bigger — why didn't the answer move?' Let them reason it out from the diagram rather than telling them.

DIFFERENTIATION

EMERGING

- Keep this group on addition bonds with wholes to 10 while the class moves to teens; leave the subtraction/hidden-whole bonds as teacher-supported.
- Set the whole and known part on the bond interactive for them and let them just step the empty part up until it lights — the finding, not the reading, is the win.

DEVELOPING

- After the copybook sums, hand them $\square - 5 = 4$ and ask them to say out loud whether the box is a part or the whole before they solve it.
- Ask them to write a bond of their own where the missing number is 6, using a whole bigger than 12.

PROFICIENT

- Pull them ahead into the Student Activity Book page, or pose: 'make three different bonds that all have 5 as the missing number — one where the box is the whole.' Have them explain to you why the box being the whole changes the sum.

✂ **Cross-curricular:** Tie to a tráth na gceist quiz score — 'you scored 8 out of a possible 10, so how many did you drop?' is the same missing-part bond.

ANSWER KEY

a) 4

b) 7

c) 4

Q1: 4

Q2: 7

Q3: $8 = 5 + 3$

Q4: 7

Q5: 4

Q6: $1 + 8$

Spot: Sean added 4 instead of taking it away. The whole is 10 and one part is 4, so $\square = 10 - 4 = \text{**6**}$.