

Writing expressions from word situations

CURRICULUM ALIGNMENT

ALG.EXP.4

articulate, represent and solve mathematical situations through the use of expressions and equations that include letter-symbols.

ALG.PRR.4b

represent mathematical structures in multiple ways, including verbal expressions, diagrams and symbolic representations.

INTERACTIVES Word Problem · challenge, display, explore

WHAT THIS LESSON TEACHES

A letter stands for a number we do not know yet. The same letter always means the same value in one problem.

→ 3 more than a number b is $b + 3$.

→ The cost of g apples at 30c each is $30g$.

MODEL THIS ON THE BOARD

TURN THE SITUATION INTO AN EXPRESSION

- 1 Find the operation word like 'more' or 'less'.
- 2 Write the letter for the unknown number.
- 3 Add the sign and the known number, watching the order.

LESSON ARC

Open with 'Aoife has t sweets, gets 5 more' and take hands-up without confirming — let a letter-for-unknown settle first. Watch and Notice runs four board situations, lingering on ' $10 - k$ ' as the order-flip. Try It Together uses the word-problem interactive: a pupil taps the operation word, the sign appears, the class writes and reads the full expression aloud. Copybook practice circles the operation word. Class Challenge is the brisk board round.

TEACHING MOVES

1. **Getting Started.** Take two or three answers on 'Aoife has t sweets, gets 5 more' and hold the answer open — don't confirm $t + 5$ yet. The one thing you're after here is comfort with a letter standing in for an amount nobody knows.
2. **Watch and Notice.** Slow right down on ' k less than 10'. Point to the words 'less than' and ask 'which number do we start from?' — draw out that we start from the bigger 10 and take k away, so $10 - k$, never $k - 10$. This is the trickiest idea; spend more time here than on the other three combined.
3. **Try It Together.** Before writing anything, ask a pupil to name the operation word aloud, then tap it on the word-problem interactive so the sign appears. The class then writes the full expression on the board and reads it in unison — ' b plus three', ' ten minus k '. Don't wait for a grade; the expression the class agrees is the answer.
4. **Write the Expression in Your Copy.** Walk the room checking the circled operation word matches the sign chosen. Your target to catch: ' w less than 20' written as $w - 20$. When you spot it, ask that pupil which number they'd start counting down from.

5. **Class Challenge.** Keep the board brisk — pupils take turns, the class confirms, move on. On 'twice the goals plus 1' flag that there are two operation words this time, so two signs: $2g + 1$. Don't re-teach each item; this round is consolidation.
6. **What Did We Notice?.** Fish for pupils naming 'less than' as the order-flipper, then revoice: 'so "less than" means start from the bigger number and take the letter away.' If someone says multiply is always 'times', widen it aloud to include 'each', 'per' and 'twice'.

COMMON MISCONCEPTIONS

⚠ A pupil writes 'k less than 10' as $k - 10$ — they translate word-order left-to-right instead of thinking about which number is bigger.

Ask 'if you have 10 and take some away, what do you start from?' Rebuild it in words on the board: start from 10, take the letter k away, so $10 - k$. Contrast it live with '3 more than b' where order doesn't matter, so pupils feel that subtraction is the one that flips.

⚠ A pupil writes 'p pencils at 30c each' as $30 + p$ or $p + 30$, reading 'each' as an add word.

Reread the sentence stressing 'each' and ask 'if you buy 3 pencils, do you add 30 once or count 30 three times?' Count 30, 60, 90 aloud so repeated buying lands as multiply: $30p$.

⚠ A pupil worries that ' $3 + b$ ' is wrong because the situation said 'more than b' and expects $b + 3$.

Reassure on the spot: with adding, the order doesn't change the value, so $3 + b$ and $b + 3$ are both fine. Then flag the contrast — this freedom does NOT hold for subtracting, which is why 'less than' needs care.

DIFFERENTIATION

EMERGING

- Give these pupils only the add and multiply situations from the copybook list while the class does all four — leave 'less than' subtraction for teacher-supported time.
- Have them copy the sentence and circle the operation word first, before choosing any sign, so the word does the work.

DEVELOPING

- After the copybook page, hand back one of their expressions and ask them to substitute a value — 'if d is 4, what is $d - 3$ worth?' — a soft bridge to next lesson.
- Add a two-word situation to their copy: 'double a number, then subtract 5' $\rightarrow 2n - 5$, so they meet two operation words before the Class Challenge.

PROFICIENT

- Give the reverse task: hand them the expression $5x - 2$ and ask them to invent a sensible everyday story that fits it, write it in their copy and read one aloud. There is no single right answer — judge whether the story genuinely matches the signs.

✚ **Cross-curricular:** Tie to English — pupils hunt a short news clip or story for the operation words ('more', 'each', 'less than', 'shared') and note which sign each one signals.

ANSWER KEY

a) $b + 3$

b) $10 - k$

c) $12n$

Q1: $b + 3$

Q2: $10 - k$

Q3: $40g$

Q4: $12n$

a) **Always** : In one problem the same letter keeps the same value.

b) **Never** : More than means we add, not subtract.

c) **Always** : Any letter can stand for the unknown.

d) **Never** : Twice means multiply by 2.

EXTENSION SHEET · STRETCH ANSWERS

S1: 20

S2: 32

S3: 64

S4: 17

S5: 15