Algebra Word Problems Year 5 Maths Notes

Simple notes for turning tricky word problems into easy equations.

Scholarly Training

1 What is algebra, really?

Algebra is just a way to write number puzzles using letters. The letter is a placeholder for a number you do not know yet. Your job is to find what number the letter stands for.

When you see x, n, or w, just think: "the number I am trying to find."

The big idea in one line

Read the words. Turn them into a number sentence with a letter. Solve for the letter.

2 Words to maths cheat sheet

Word problems are written in English. To solve them, swap English words for maths symbols. Here are the most common ones.

Words you might see	Symbol	Meaning
sum, total, altogether, more than, increased by	+	add
difference, less than, fewer, decreased by, minus	-	subtract
product, times, of, double (×2), triple (×3)	×	multiply
quotient, divided by, shared, halves, per	÷	divide
is, equals, the result is, gives, makes	=	equals
a number, some, an amount	n or x	the unknown

These words are clues. The relationship in the question decides the operation.

3 The 4-step method

Every algebra word problem can be cracked using the same four steps. Do them in order every single time.

01 Read it twice

Read the problem once to get the story. Read it again slowly and underline the numbers and the important words (sum, more than, twice, altogether).

02 Pick a letter

Choose a letter for the thing you do not know yet. Often it is the smallest or simplest amount. Write it down: "Let n = number of marbles Ben has."

03 Build the equation

Use your cheat sheet to turn each relationship into symbols. Check the order carefully, especially with phrases such as “less than”.

04 Solve and check

Use balance moves (do the same thing to both sides) to get the letter by itself. Then put your answer back into the original story to check it works.

4 Key equation shapes to know

Most Year 5 algebra problems fit one of five shapes. Once you know the shape, you know what to do.

Shape A: One simple unknown

Looks like: 3n + 5 = 20 or 2k = 26.

Use when: a number is multiplied, added to, or both.

Example: “Oscar buys five identical packs of cards and already has eight cards. He now has 83 cards.”

Shape B: Two unknowns that add to a total

Looks like: x + (3x + 5) = 53.

Use when: two people or things are linked, and you know their combined total.

Example: “Ben has x marbles. Ava has 5 more than three times Ben. Together they have 53.”

Shape C: Consecutive odd or even numbers

Looks like: n + (n + 2) + (n + 4) = total.

Use when: three odd or three even numbers in a row. Add 2 each time because every second whole number is odd or every second is even.

Shape D: Rate plus a fixed fee

Looks like: fixed fee + (rate × amount) = total. For example, 4 + 2k = 30.

Use when: there is a flat charge plus a per-unit cost.

Example: “$4 booking fee plus $2 per kilometre. Total $30.”

Shape E: Average problems

Looks like: total of all numbers ÷ how many numbers = the average.

Use when: the question gives you the average and asks for a missing number. First multiply the average by how many numbers there are to get the total, then subtract the numbers you know.

5 Worked examples

Here is the 4-step method in action on real questions from your practice set.

Example 1 | Question 1 from the set

> **Problem:** Mia thinks of a number. She triples it, subtracts 7, then halves the result. The final answer is 10. What was Mia's original number?

Step 1. Read it twice. Mia does three things to her number: triples (×3), subtracts 7, then halves (÷2). End result is 10.

Step 2. Pick a letter. Let n = Mia's original number.

Step 3. Build the equation. Triple n: 3n. Subtract 7: 3n - 7. Halve it: (3n - 7) ÷ 2. This equals 10. So: (3n - 7) ÷ 2 = 10.

Step 4. Solve. Multiply both sides by 2: 3n - 7 = 20. Add 7 to both sides: 3n = 27. Divide both sides by 3: n = 9.

Check and answer

Triple 9 = 27. Subtract 7 = 20. Halve 20 = 10.

Answer: 9.

Example 2 | Question 4 from the set

> **Problem:** Ben has x marbles. Ava has 5 more than three times as many marbles as Ben. Together they have 53. How many marbles does Ava have?

Step 1. Read it twice. Ben is the smaller amount. Ava is built from Ben's amount (3 times Ben, then plus 5). The total is 53.

Step 2. Pick a letter. The question already uses x for Ben. So Ben = x, Ava = 3x + 5.

Step 3. Build the equation. Ben + Ava = total: x + (3x + 5) = 53.

Step 4. Solve. Combine the x terms: 4x + 5 = 53. Subtract 5 from both sides: 4x = 48. Divide both sides by 4: x = 12.

But the question asks for Ava, not Ben. Ava = 3(12) + 5 = 36 + 5 = 41.

Check and answer

Ben has 12, Ava has 41. Together: 12 + 41 = 53.

Answer: 41.

5 Worked examples: continued

Example 3 | Question 6 from the set

> **Problem:** The sum of three consecutive odd numbers is 87. What is the largest of the three numbers?

Step 1. Read it twice. Three odd numbers in a row, like 5, 7, 9 or 11, 13, 15. They add up to 87.

Step 2. Pick a letter. Let n = the smallest of the three. The next odd number is n + 2. The one after is n + 4.

Step 3. Build the equation. n + (n + 2) + (n + 4) = 87.

Step 4. Solve. Combine: 3n + 6 = 87. Subtract 6: 3n = 81. Divide by 3: n = 27.

The three numbers are 27, 29 and 31. The largest is 31.

Check and answer

27 + 29 + 31 = 87. All three are odd.

Answer: 31.

Example 4 | Question 14 from the set

> **Problem:** Box A has x cards. Box B has 6 more than Box A. If 3 cards are moved from A to B, Box B then has twice as many as Box A. How many cards were originally in A?

Step 1. Read it twice. Two boxes change after a move. Write down both the BEFORE and AFTER amounts.

Step 2. Before and after the move. Before the move: Box A = x, Box B = x + 6. After the move (A loses 3, B gains 3): Box A = x - 3, Box B = x + 6 + 3 = x + 9.

Step 3. Build the equation. After the move, Box B is twice Box A: x + 9 = 2(x - 3).

Step 4. Solve. Open the bracket: x + 9 = 2x - 6. Add 6 to both sides: x + 15 = 2x. Subtract x from both sides: 15 = x. So x = 15.

Check and answer

Originally A = 15, B = 21. After moving 3: A = 12, B = 24. Is 24 twice 12? Yes.

Answer: 15.

6 Common traps to watch for

These are the mistakes students make most often. If you can spot them, you will jump ahead of the pack.

Trap 1: Changing the order of operations

"Five more than three times a number" means 3n + 5. "Three times the sum of a number and five" means 3(n + 5). For the first phrase, triple first, then add 5. Note that 5 + 3n and 3n + 5 are equivalent.

Trap 2: Answering for the wrong letter

If you let x = Ben, but the question asks for Ava, you must do one more step. Always re-read the question after you solve. Underline what is actually being asked.

Trap 3: Forgetting the perimeter formula

Perimeter = 2 × (length + width).

Perimeter problems often look like 62 = 2 × ((2w + 4) + w). Divide both sides by 2 first to make life easier. Then solve.

Trap 4: Losing the minus sign

"Sienna has $6 less than twice Luca" means 2x − 6, not 6 − 2x. Start with the amount being reduced, then subtract what is taken away.

Trap 5: Skipping the check

Every time. Put your answer back into the original problem (the words, not the equation). If it does not work, you have made a mistake somewhere.

7 Balance moves

An equation is a balance scale. Whatever you do to one side, you must do to the other. That is the whole secret.

The 4 balance moves

- Add the same number to both sides.
- Subtract the same number from both sides.
- Multiply both sides by the same non-zero number.
- Divide both sides by the same non-zero number.

The goal is to peel away the numbers around your letter, one move at a time, until the letter is alone on one side.

The order: undo the operations backwards

If the equation builds up by multiplying then adding, you undo by subtracting first then dividing. It is the reverse order. Think of taking off your shoes before your socks.

Example: solve the equation

$3n + 5 = 20$

1. The +5 was added last, so undo it first. Subtract 5 from both sides: 3n = 15.
2. The ×3 came first, so undo it last. Divide both sides by 3: n = 5.

8 Quick checklist before you write your answer

- Did I read the question twice?
- Did I write down what my letter stands for?
- Did I get the order of operations right (especially with "less than" and "more than")?
- Did I answer for the right person or thing?
- Did I check my answer in the original word problem?
- Did I include the units (cm, $, marbles)?