

Equation Check Lab

Confirm or reject candidates with chips, tiles and equal groups

GRADE 6 • 6.PFA.3.d

6.PFA.3.d "Confirm solutions to one-step linear equations in one variable using a variety of concrete manipulatives and pictorial representations (e.g., colored chips, algebra tiles, weights on a balance scale)."

NAME _____

DATE _____

BUILD UNDERSTANDING

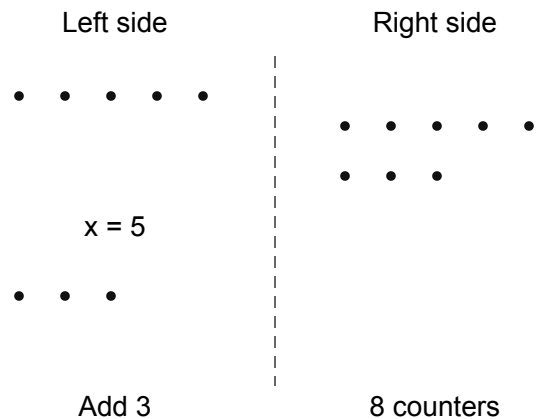
A solution makes both sides equal. Replace x with the proposed value in a model, carry out the operation, and compare. A $+1$ chip and a -1 chip make a zero pair. Use counters or draw them; for a rejected candidate, explain the mismatch. A numerical check supports your model.

WORKED EXAMPLE

Use the model to check $x = 5$ in $x + 3 = 8$.

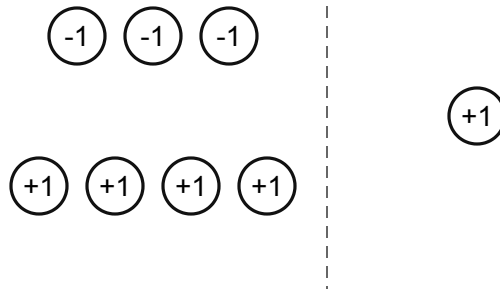
1. Count the five counters that replace x .
2. Include the three added counters; compare the total with eight.

Answer: Yes. The left has $5 + 3 = 8$ counters, matching the right.



PRACTICE 4 problems

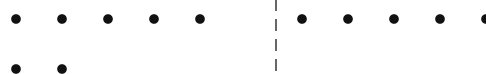
- 1** Test $x = -3$ in $x + 4 = 1$ using the signed chips. Cross out three zero pairs. State the value left and whether the candidate works.

Left: $-3 + 4$ Right: $+1$ 

- 2** Test $x = 7$ in $x - 3 = 5$. Cross out three counters on the left. Compare the remaining counters with the right side.

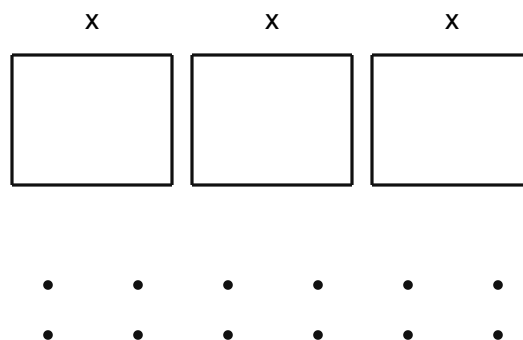
Left side

Right side

Start: $x = 7$

Target: 5

- 3** Test $x = 4$ in $3x = 12$. Draw four unit counters in each x tile. Compare the combined count with the right side.



Right side: 12 unit counters

- 4** Test $x = 9$ in $x / 3 = 4$. Share the nine counters equally into the three boxes by drawing their contents. Does each box have four?

Start with 9 counters



Share equally into 3 boxes

APPLY IT Show your work

- 1** A science box has mass x kg; adding 1 kg makes 2.5 kg. Test $x = 1.5$ using the half-kilogram counters. Draw the candidate in the box and compare the two sides.

$x = 1.5$ kg



Add 1 kg

Each counter represents 0.5 kg



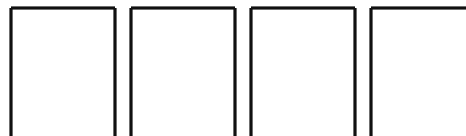
Target: 2.5 kg

2

A club splits x tokens into four equal groups of three.

Test $x = 12$ in $x \div 4 = 3$ by drawing the shared groups and explaining the result.

Start with 12 counters



Share equally into 4 boxes

CHALLENGE

One step up

Test $x = 8$ in $x - 5 = 4$ by crossing out five counters. Explain the mismatch. Then state a corrected candidate and how its counter model would change.

Left side



Right side



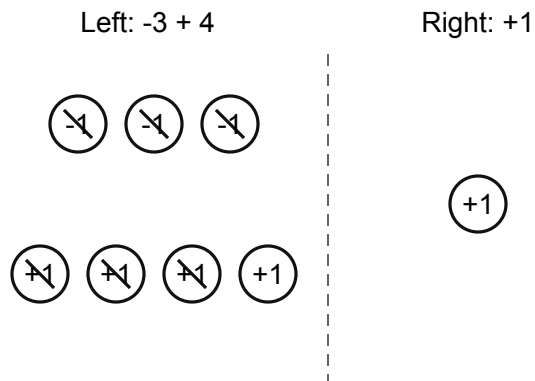
Start: $x = 8$

Target: 4

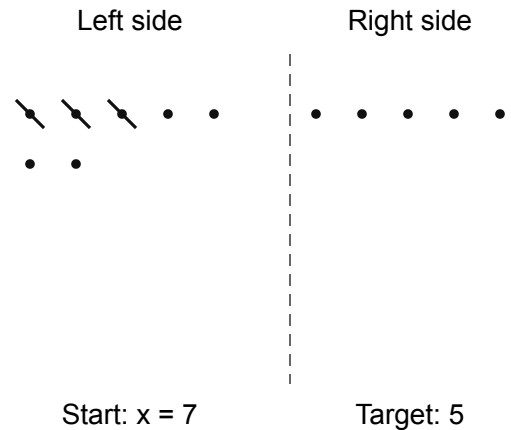
Assess the model action, not substitution alone. Crossed counters are removed; crossed opposite-sign pairs total zero. For sharing tasks, the upper pile is the starting collection and the lower boxes show its redistribution, not extra counters. The mass task uses 0.5 kg per counter. Diagrams use small counts so model reasoning stays visible.

PRACTICE 1

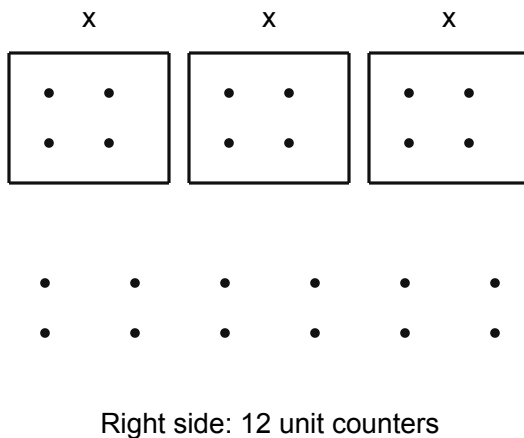
Three $(-1, +1)$ pairs total zero. One $+1$ chip remains, matching the right side; $x = -3$ works.

**PRACTICE 2**

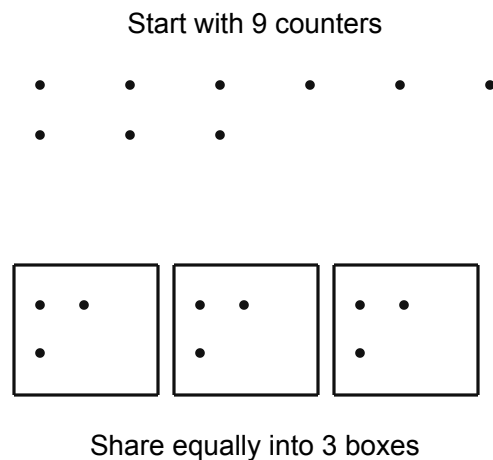
Four remain on the left, but five are needed on the right. Since $7 - 3 = 4$, $x = 7$ is not a solution.

**PRACTICE 3**

The three groups contain $4 + 4 + 4 = 12$ counters, matching 12. The candidate works.

**PRACTICE 4**

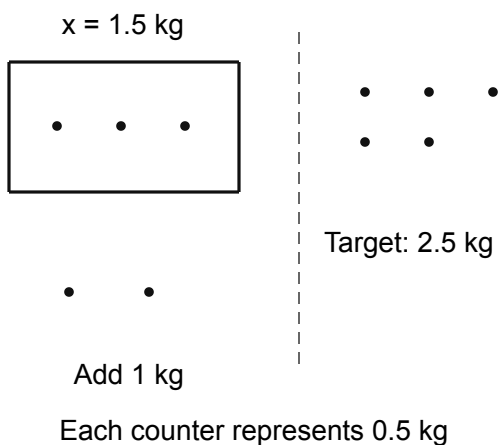
Each box receives three, not four. The candidate fails because $9 / 3 = 3$.



APPLY IT 1

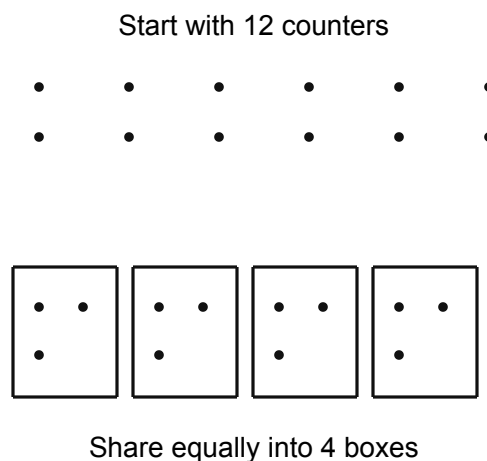
Three counters plus two give five; the candidate works.

Each counter is 0.5 kg: $3 \times 0.5 + 1 = 2.5$ kg. The model matches the target.



APPLY IT 2

Each of four boxes receives three; $x = 12$ works. The equal groups use all twelve: $3 + 3 + 3 + 3 = 12$, confirming $12 \div 4 = 3$.



CHALLENGE

Eight leaves three, not four, after removing five. The corrected candidate is $x = 9$: start with one more counter, so $9 - 5 = 4$.

