Lesson - Missing number problems

Year: Year 1

Hello, I am Otto! A missing number problem is like a little puzzle. One number is hiding, and you are the detective who finds it. You already know addition and subtraction, so you have the tools you need.

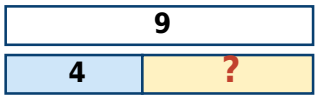
Starter activity

Put 10 counters in a pot. Hide some under a cup and leave 6 on the table. Ask a friend: "How many counters are under the cup?" Work it out together. Then lift the cup and check. You have just solved 6 + ? = 10!

What is a missing number problem?

Definition: missing number

A **missing number** is a number we do not know yet. We show it with a box, a question mark or a blank space, like this: 4 + **?** = 9. We must find the number that makes the number sentence true.



The whole bar is 9. One part is 4. The other part is missing.

Example 1

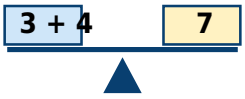
Find the missing number: 4 + ? = 9.

Start on 4 and count on to 9: 5, 6, 7, 8, 9. That is 5 steps. The missing number is **5**. Check: 4 + 5 = 9.

The equals sign means "the same as"

Definition: equals

The sign = means *is the same as*. What is on the left must be the same amount as what is on the right. Think of a balance: both sides must weigh the same.



Rule: balance

- Both sides of = are worth the same.
- The missing number can be on the left or on the right.
- 10 = 6 + 4 means the same as 6 + 4 = 10.

Example 2

Find the missing number: 12 = ? + 5.

12 is the whole. 5 is one part. The other part is 12 − 5 = 7. So the missing number is **7**. Check: 7 + 5 = 12.

Missing numbers in addition

Method: missing number in an addition

1. Find the total (the biggest number).
2. Find the part you know.
3. Take the part away from the total. The answer is the missing part.
4. Check by adding.

Example 3

Find the missing number: ? + 8 = 15.

The total is 15. One part is 8. 15 − 8 = 7. The missing number is **7**. Check: 7 + 8 = 15.

Missing numbers in subtraction

Method: missing number in a subtraction

1. Look at the sentence 9 − ? = 4. The 9 is the number you start with.
2. You end with 4. How many did you take away?
3. Count from 4 up to 9, or work out 9 − 4.
4. Check by taking away.

Example 4

Find the missing number: 9 − ? = 4.

Start with 9 and end with 4. We took away 9 − 4 = 5. The missing number is **5**. Check: 9 − 5 = 4.

Example 5

Find the missing number: ? − 6 = 7.

We start with a number, take away 6 and have 7 left. So we must add 6 back: 7 + 6 = 13. The missing number is **13**. Check: 13 − 6 = 7.

Watch out

- Do not just put the two numbers you see together. In 9 − ? = 4, the answer is not 13!
- Always check by putting your number into the sentence.
- The missing number might be the first number, as in ? + 5 = 11.

Using what you know

Key fact: related facts

- If 6 + 7 = 13, then 13 − 7 = 6 and 13 − 6 = 7.
- Number bonds to 10 help: if 3 + ? = 10, then ? = 7.
- Doubles help: ? + ? = 12 means ? = 6.

Example 6

Find the missing number: ? + ? = 14.

Both numbers are the same. This is a double. Half of 14 is 7. So the missing number is **7**. Check: 7 + 7 = 14.

Example 7: a story

Ella has some pencils. She gets 5 more and then she has 12. How many did she have at the start?

Write it as a missing number sentence: ? + 5 = 12. 12 − 5 = 7. Ella had **7** pencils at the start.

Did you know?

Detectives and maths solvers use the same trick: work backwards from what you know. A very old kind of puzzle, written in Egypt nearly 4000 years ago, asked "A number and its half make 12. What is the number?"

Otto's tip

Always put your answer back into the number sentence. If both sides match, you have solved the puzzle. A good detective checks the clue!