

## Grade 2: Seashells

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**2.OA.A.1:** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Mateo had some shells. Then Mateo gave 6 shells to his sister. After that, Mateo had 8 shells. How many shells did Mateo have at first?

Answer:  shells

### Solution

Correct if student writes 14.

One way to solve the problem is to imagine what would happen if Mateo *took back* the 6 shells that he gave to his sister. Then Mateo would have  $8 + 6 = 14$  shells. So Mateo must have had 14 shells to begin with.

Another way to think about the problem would be to write an equation that tells the story of the situation:

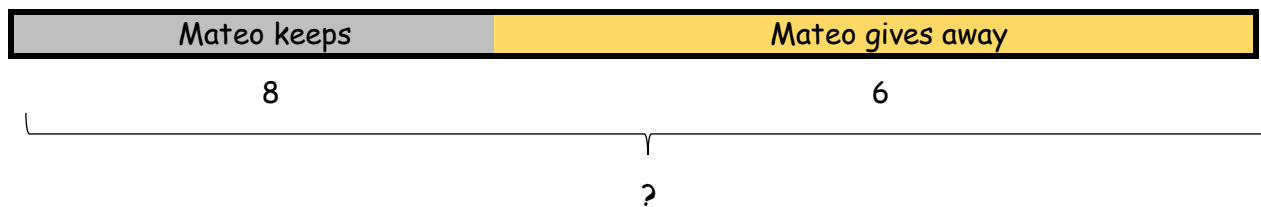
$$? - 6 = 8$$

("Mateo started with some number of shells, gave away 6, and was left with 8.") The unknown number "?" in this equation must be the sum  $8 + 6$ , because if you take 6 away from that sum, you get 8.

Once a student decides that the answer is found by adding  $8 + 6$ , the best way to calculate the value of  $6 + 8$  is by just knowing that the sum is 14.

Some students might solve the problem by drawing x's or other marks that stand for the 6 shells Mateo gave to his sister and the 8 shells Mateo had left. This can help them see that the answer is found by adding 6 and 8.

A more efficient diagram might look like this:



This diagram shows why the answer is found by adding  $8 + 6$ .

(The diagrams the student draws don't have to be to scale; they just have to reflect the basic relationships in the problem.)

If the student answered the problem incorrectly, ask how they solved the problem. It's possible they wrote the wrong number by mistake or had a hard time understanding the situation. You could try setting up the problem at a table using pennies for the shells. Place a group of 6 pennies on the table ("Mateo gave these to his sister"). Place group of 8 pennies some distance away ("Mateo keeps these"). Then ask the student to tell how many shells Mateo started with. If the student is stuck, sweep the two groups of pennies together in order to show the situation at the beginning, before Mateo gave the shells away.

When you sweep the pennies together, you are acting out the central addition idea in the problem. Doing so may help the student see that the answer to the problem is found by adding  $8 + 6$ .

If students give the incorrect answer 2, it might be because they saw the phrase "gave 6 shells to his sister" and decided to *subtract* 6 (because "giving away" seems like a subtraction step). This could lead some students to give the incorrect answer  $8 - 6 = 2$ . The idea to subtract 6 is correct—but 6 is to be subtracted from Mateo's *initial* number of shells, not from his *final* number.

### Elaboration on Alignment

The situation type in this problem is "Take From with Start Unknown." This is among the hardest situation types in addition and subtraction, recommended for the end of grade 2 in the relevant [Progression table](#). Because the situation type is among the hardest for addition and subtraction, the numbers in the problem are small, within the basis of known facts (as opposed to the snake problem, which required a two-digit subtraction). The basic fact  $8 + 6 = 14$  is not among those that appear in 2.P.3.

This situation type strongly foregrounds relationships between addition and subtraction. One natural equation model for the problem is  $? - 6 = 8$ , using the subtraction sign. By mentally reversing the action of the problem, this becomes  $? = 8 + 6$ , with a plus sign.

Students who reflexively use "key words" to decide what operation to use are at risk for getting this problem wrong.

The numbers in the problem were chosen to be at least 2 apart, so that the plural "shells" in the answer frame wasn't a clue (which it might have been, had the given numbers been, say 8 and 9).

## Learn More

See a digital version of this task at Learning Heroes' Readiness Check:

<https://bealearninghero.org/readiness-check>

Name: \_\_\_\_\_

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Answer:  shells