Siblings' Ages

Problem wording

María and Raúl are siblings. We know María is 5 years older than Raúl.

Identification of specific cases and recognition of structure

1. When Raúl is 7, how old will María be? How did you find the answer?

2. When Raúl is 15, how old will María be? How did you find the answer?

3. When Raúl is 80, how old will María be? How did you find the answer?

Formulating a conjecture

4. In a photo of Raúl's birthday, you can see the number of candles on the cake. How can we figure out how old María was on Raul's birthday?

Validating a conjecture

5. Draw a table with all the information on Raúl's and María's ages.

6. Fill in some of the rows in the table with amounts that can be true. Remember that María is 5 years older than Raúl. Don't write anything on the row with grey shading.

Raúl's age	Operation to find Marías' age	María's age
7		
15		
80		
⇨	➡	

Generalising a conjecture

7. Choose a letter to mean Raúl's age. Write that letter in the row with grey shading, alongside the white arrow.

Alongside the black arrow write down how to use the letter to figure out María's age.

Exploring the inverse relationship

	8. When María is 66, how old will Raúl be? How did you find the answer? 9. If you know how old María is, how can you find Raúl's age?
Purpose	• To apply a rule governing the function to specific numerical cases. • To generalise the functional relationship. • To generalise the functional relationship in cases involving an indeterminate quantity.
Suggestions for classroom delivery	In this task, the functional relationship is implicit in the problem wording. The teacher should encourage students to allude to the context in their explanations of how they found the answers to questions 1 and 3. Students tend to reply in very general terms, such as 'I added it' or 'because I did the operations'. The objective is for them to relate their operations to the context, with remarks such as 'I added 5 to Raúl's age because María is 5 years older'. When working with specific examples, both the arithmetic expression used and the result should be assessed. On occasion the expression and representation of the functional relationship may be correct but the answer wrong due to operational error or misunderstanding of the data provided. Teachers may ask students to arrange the data in a table drawn from scratch or to include the data in a pre-prepared table such as in task 6. Here students should be encouraged to find examples that validate their conjectures, either using cases set out previously or inventing new ones. Teacher and student should then discuss whether it is easier to recognise regularity when the data are neatly organised. When students use a letter to represent an indeterminate quantity for the first time, they may not fully understand its meaning. In those cases, the teacher may clarify the idea by saying 'it can be any quantity" or 'we don't know the quantity'. When students fill in the second column they should relate the values to the operations performed previously. They should notice what remains constant and what varies, how the values relate to the problem wording and whether the same information can be conveyed with a letter.