SUPPLEMENTARY MATERIALS

SEQUENCE OF PROBLEMS

PART A

A.1 This board shows some of the squares where the knight can go by making one move (circles) and by making two moves (squares). Fill in the missing circles and squares.
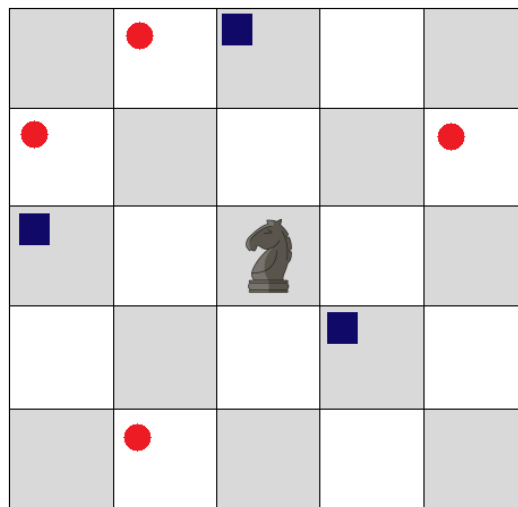
A.2 You have to find now the squares where the knight can go with a third move. Mark them with a triangle.

A.3 Draw on the board the axes of symmetry that you find.

A.4 The knight has not yet gone to some squares. How many moves does it have to make to go to them? Explain how you found out:

_____
_____
_____

A.5 What color are the squares the knight visits on each move? Circle the correct option:

- First move: White /Black.

- Second move: White/Black.

- Third move: White/Black.

SEQUENCE OF PROBLEMS Continued

A.6 Look at the answers to the previous exercise. Explain what you think is happening:

_____
_____
_____
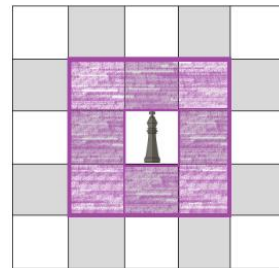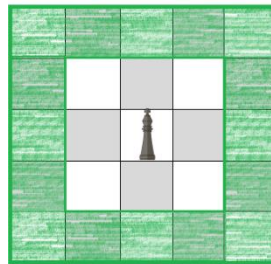
A.7 This king wants to get as far away as possible. Help him escape:
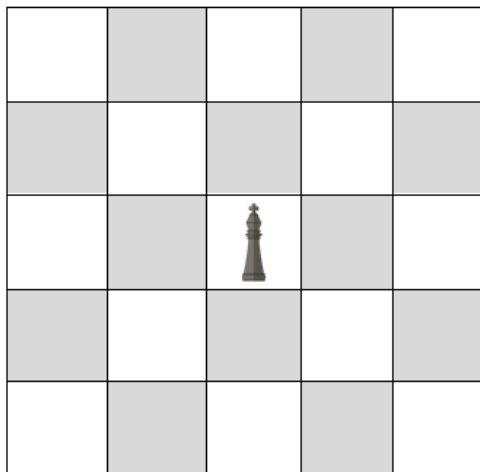If he makes **one** move, he has **8** squares to choose from.

If he makes **two** moves, he has **16** squares to choose from.

If he makes **three** moves, how many squares does he have to choose from?
You can use this board, if you need it. Explain how you did it.
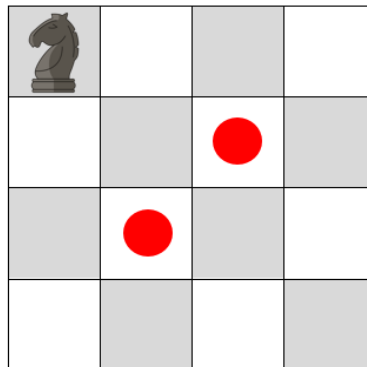
SUPPLEMENTARY MATERIALS

Vera Sáez-Benito, D. M., & Arnal-Bailera, A. (2022). Working with patterns through chess-based problems. Strategies and reasoning levels of primary school students. *International Journal of Innovation in Science and Mathematics Education, 30*(2), 14-28.

SEQUENCE OF PROBLEMS Continued

PART B

B.1 Look at the squares to which this horse can go if it makes one move. Find the squares the knight can go to in the following cases:

-The knight makes two moves. Mark them with a square.

-The knight makes three moves. Mark them with a triangle.

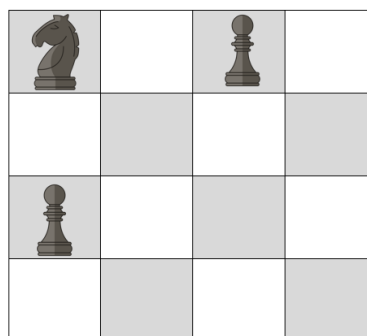**B.2** Find the similarities and differences among the three moves.

_____
_____
_____

B.3 What do you think will happen if the knight is placed in another corner of the board?

_____
_____
_____

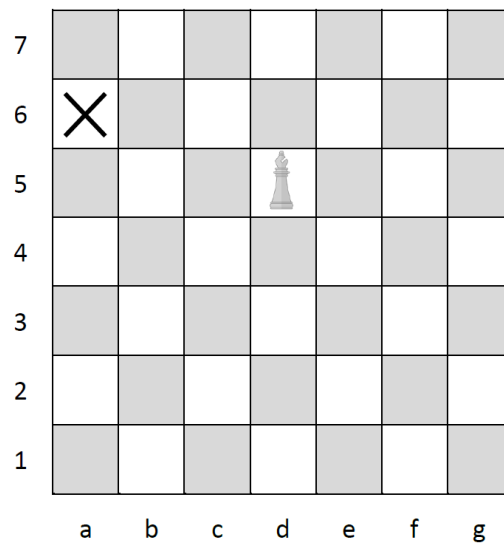**B.4** In this occasion, we have two pawns in the board. Which squares **can't** the knight go to?

SUPPLEMENTARY MATERIALS

Vera Sáez-Benito, D. M., & Arnal-Bailera, A. (2022). Working with patterns through chess-based problems. Strategies and reasoning levels of primary school students. *International Journal of Innovation in Science and Mathematics Education, 30*(2), 14-28.
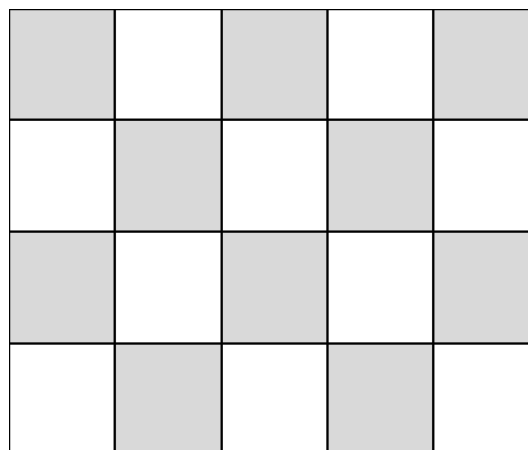
SEQUENCE OF PROBLEMS Continued

PART C

C.1 This bishop has moved from the square marked with an X to the square d5. This bishop always moves in the same way. Find the next square it will reach:

C.2 Draw with arrows (↗↘↙↖) the move the bishop makes to move. There is more than one possible solution.

C.3 The bishop was first on the square a6, then it has gone to d5. Name the square it goes to next and find what the next 2 squares would be, if the board did not end.

SUPPLEMENTARY MATERIALS

Vera Sáez-Benito, D. M., & Arnal-Bailera, A. (2022). Working with patterns through chess-based problems. Strategies and reasoning levels of primary school students. *International Journal of Innovation in Science and Mathematics Education, 30*(2), 14-28.
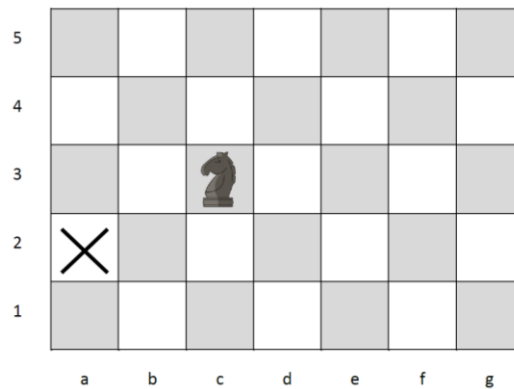
SEQUENCE OF PROBLEMS Continued

C.4 Explain to a friend how letters and numbers change:

_____
_____
_____

C.5 This knight has moved from the square marked with an X to square c3. Find the squares it will reach in its next 2 moves:

C.6 Draw on the board with blue arrows the moves that the knight makes to move. There is more than one possible solution.

C.7 The knight was first on the square a2, and then it has gone to c3. Name the 2 squares where it goes next and find which would be the next 3, if the board did not end.

C.8 Imagine that the knight this time goes from a4 to c3. Draw this move on the board with red arrows. Is there any axis of symmetry? Draw it on the board.

C.9 Explain to a friend how you figured it out:

_____
_____
_____

SUPPLEMENTARY MATERIALS

Vera Sáez-Benito, D. M., & Arnal-Bailera, A. (2022). Working with patterns through chess-based problems. Strategies and reasoning levels of primary school students. *International Journal of Innovation in Science and Mathematics Education, 30*(2), 14-28.
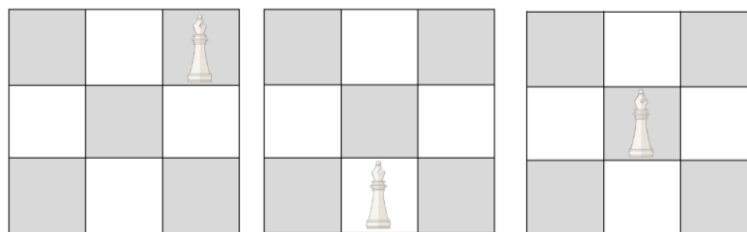
SEQUENCE OF PROBLEMS Continued

PART D

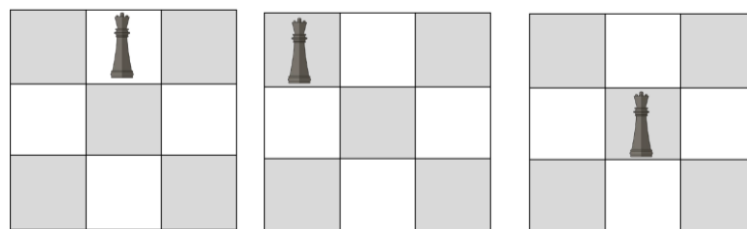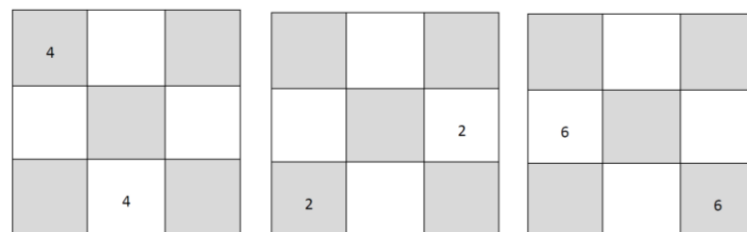Mark the squares threatened by these pieces in each case:
The rook:
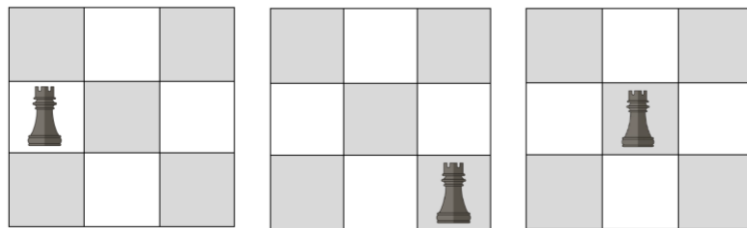
The bishop:

The queen:

Here you can see the number of squares these pieces threaten from different positions. Complete the boards:

Rook	Bishop	Queen

Compare the three boards you just filled in. What relationship do you observe between them? Why do you think this happens?

_____

_____

_____