PUZZLING CARTOON

- THE FROG -

AMAZINGMATHS

Materials:

- Video of the puzzle
- Sheets of paper
- Pencils

The puzzle

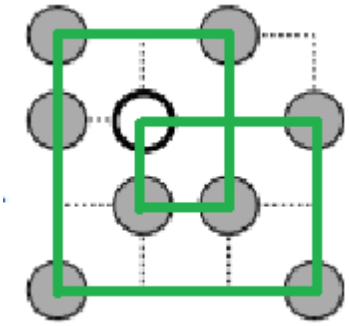
In Mathville's park, there is a quiet pond decorated with one white stone and eight grey stones. Gertrude the frog lives there and is the queen. A toad that would like to become the king of the pond challenges the frog. It has to move around all the pond's stones without falling into the water to remain queen. The frog can only move from left to right or right to left and from the top to the bottom or the bottom to the top. Plus, it can never jump over a stone or go back on a stone on which it already landed. Gertrude needs your help to succeed.

Which path does it have to follow to visit every stone and come back to its starting point?

PUZZLE SOLUTION

The answer:

Here is the path the frog will have to follow to accomplish the toad's challenge.



The solution:

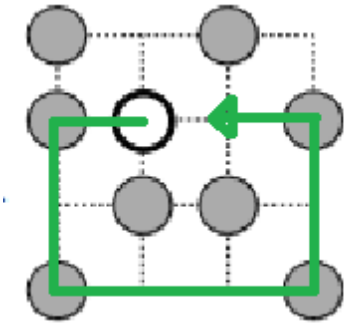
There are many ways to solve this puzzle. Of course, we can solve it by trial and error, but it is possible to approach this puzzle with a certain logic.

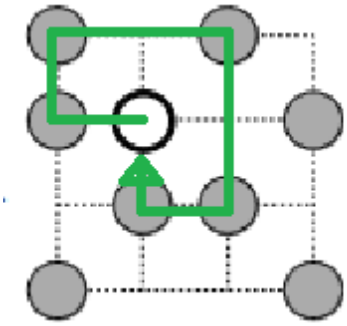
The frog, which is on the white stone, has to move around all the grey stones of its pond. It must respect the constraints indicated by the toad.

- It can only move horizontally or vertically.
- It cannot go back on a stone on which it already landed.
- It cannot jump over a stone.

According to these criterions, the frog has 3 choices to begin its route: the **left** stone, the **right** stone or the **bottom** stone. It must then respect the constraints for its other movements.

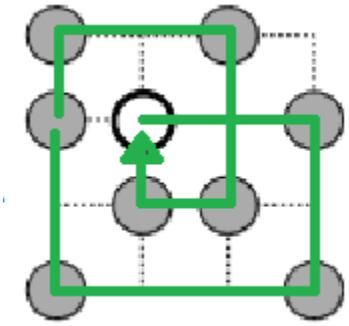
Here are its possible paths if it starts its route by jumping on the **left** stone.





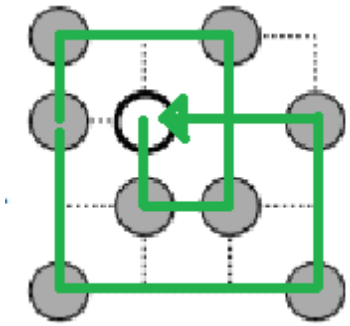
These two paths do not work, because the frog cannot jump on all the stones of its pond while respecting the toad's constraints.

Here is its path if it starts on the **right** stone.



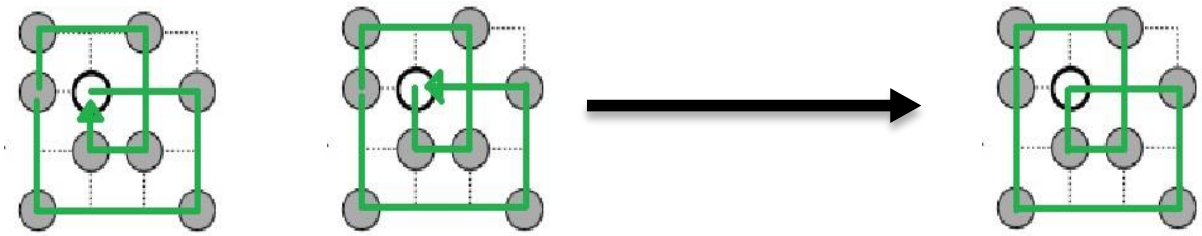
This path works, because the frog jumps on all the stones while respecting the toad's constraints.

Here is its path if it starts its route on the **bottom** stone.



This path works, because the frog jumps on all the stones while respecting the toad's constraints.

N.B. If we carefully observe the two paths that work, we notice that they are the same.



The solution's path forms a loop. The frog can therefore start its route on the right or the bottom. It will jump on all the stones of its pond and go back on the white stone at the end, while respecting the constraints stated by the toad.