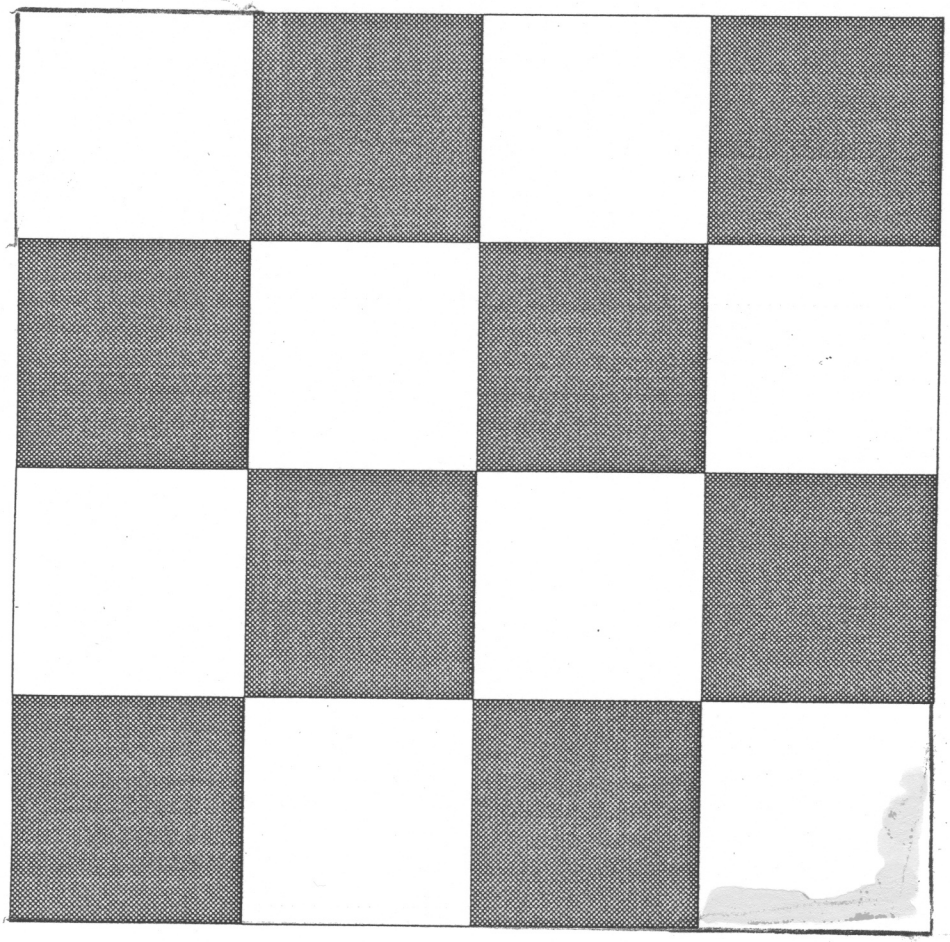
You will need dominos or large paper clips (something that will cover two squares next to each other in a row or column) and pennies or other markers that cover one square.

1. Mark off the top two squares with pennies, and try to cover the rest of the board with dominos.
2. Do the same with the pennies in the top left and bottom right squares; can you cover the board with domonoes?
3. Can you try the same things on a larger board?
4. Which problems are possible? Which are not possible? Why?



Discussion:

The first problem is possible, but the second is not.

To explain why #2 is not possible, you can try to describe every possible combination, but it is hard to know if you have recorded all the possibilities, and even if you have, it is not easy to convince someone else.

The better technique is to count the black and white squares separately. Since each domino will cover one black and one white square no matter how it is placed, the dominoes must cover equal numbers of squares. #1 has seven white squares and seven black squares, so it seems possible, but #2 has six white and 8 black, so it is clearly impossible. For the larger squares, if you block out specific squares with pennies, you need to have equal numbers of black and white left or the problem is impossible.

Question: When there are equal numbers of black and white, will it always be possible? The argument above can rule out the problems that are not possible, but that is all.