



Problem of the Week

Problem B and Solution

Not a Tetris™ Game

Problem

On June 6, 2024, the puzzle game Tetris™ will be 40 years old! The game of Tetris™ uses pieces called “tetrominoes”, which are shapes composed of four identical squares, like the ones given at the bottom of this page. This problem is inspired by Tetris™.

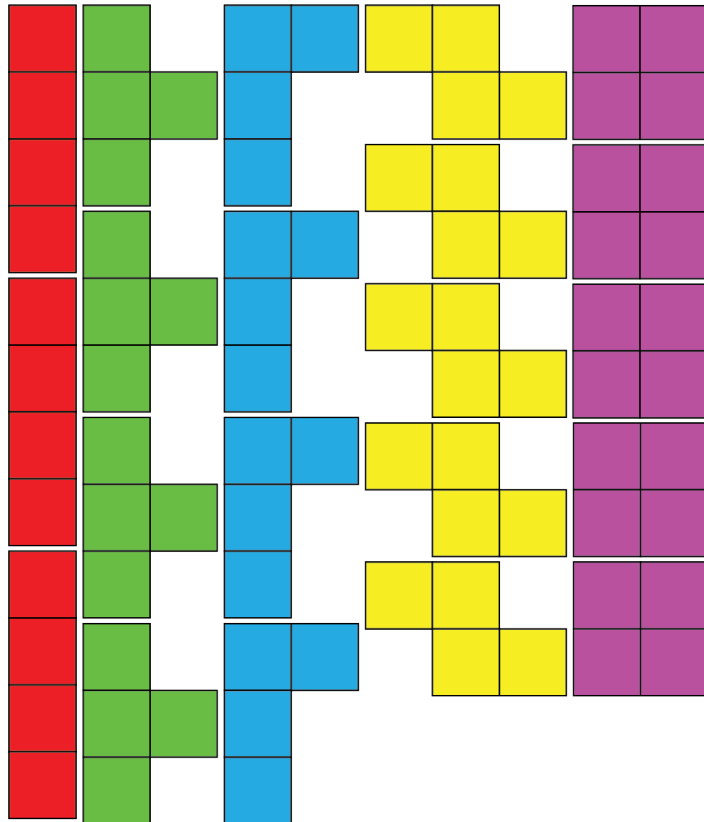
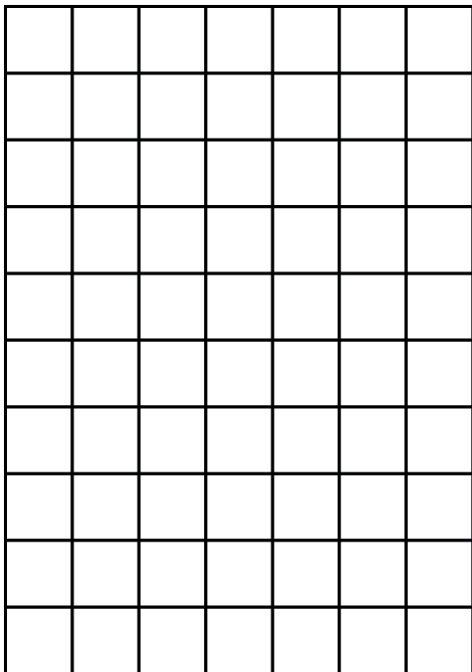
In this problem, tetromino pieces are to be placed in a grid according to the following rules:

1. Pieces may be rotated or reflected (flipped over).
2. Pieces may **not** overlap each other and each square in a piece must be placed directly on top of a square in the grid.
3. Only the given pieces may be used, but you do not need to use all of them.

The goal is to cover as many squares in the grid as possible with the pieces. Is it possible to cover all the squares in the given grid? Explain why or why not.

When answering this question, you may find it helpful to cut out the given tetrominoes and place them on the grid.

Not printing this page? You can use our [interactive worksheet](#).





Solution

The grid has a total of $7 \times 10 = 70$ squares and each piece has 4 squares. Since $70 \div 4 = 17.5$, which is not a whole number, that tells us that 70 is not a multiple of 4. So it is not possible to cover all the squares in the grid. At most, we would be able to cover $17 \times 4 = 68$ of the squares. One such possibility is shown.

