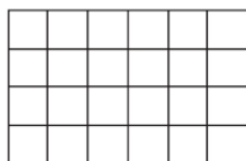


Tiling the Grid Problem – Solutions

Look at the grid and shape.



Grid

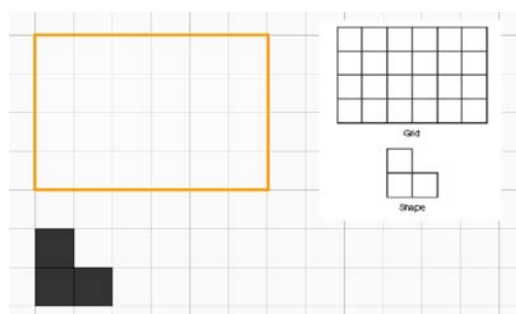


Shape

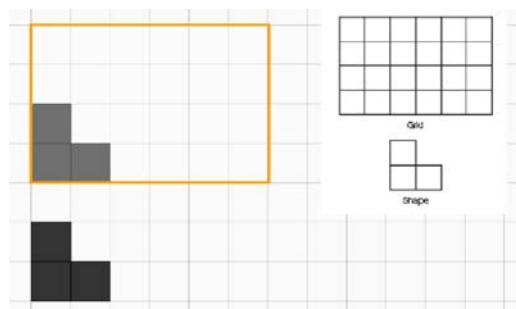
Show how to use the small shape to cover the grid with no gaps or overlaps.

Solution 1:

This solution was created using mathies Colour Tiles (mathies.ca)



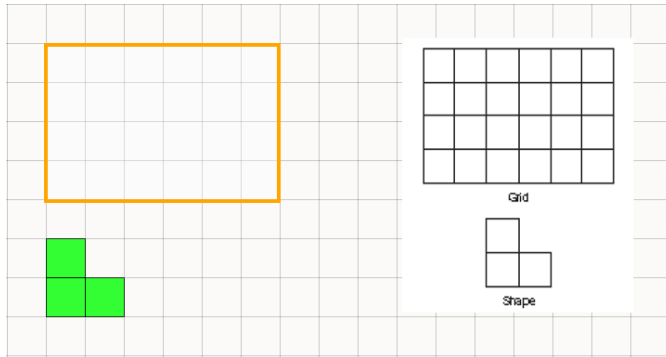
Consider the small shape to be a new unit tile that is composed of three small square tiles. (unitizing)



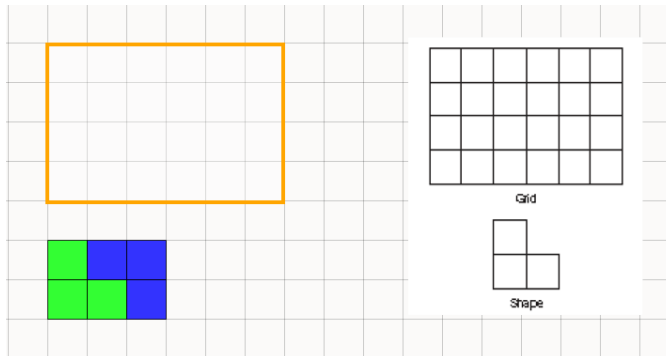
Place the first unit tile.

Solution 2:

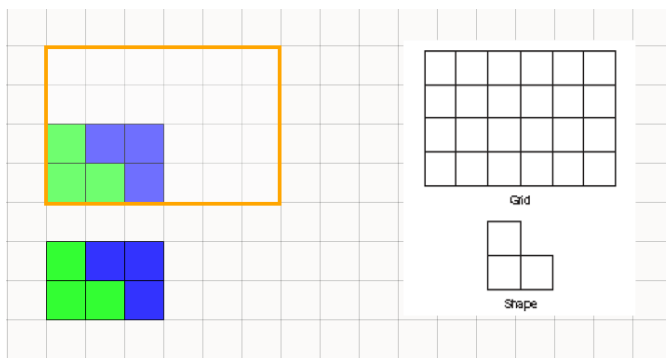
This solution was created using mathies Notepad Tool (www.mathies.ca/learningTools.php)



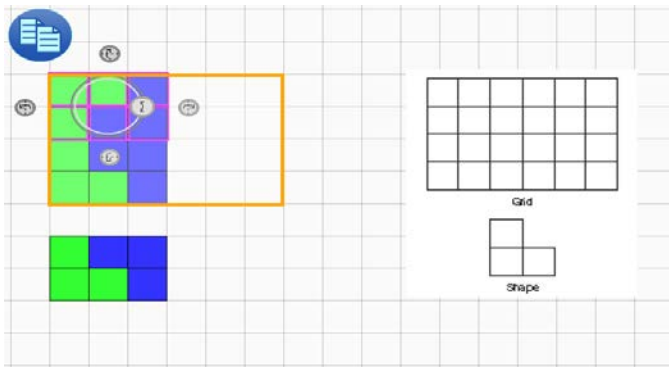
Consider the small shape to be a new unit tile that is composed of three small square tiles. (unitizing)



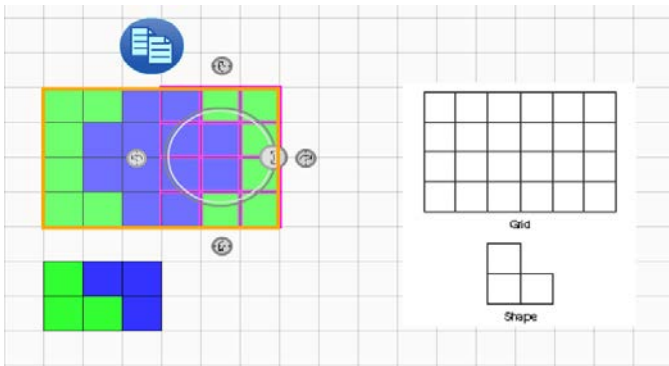
Rotate the green unit tile a half turn, change its colour to blue and place it so the green and blue unit tiles form a rectangle. Consider this rectangle to be a rectangular unit tile that is composed of six small square tiles. (doubling and unitizing)



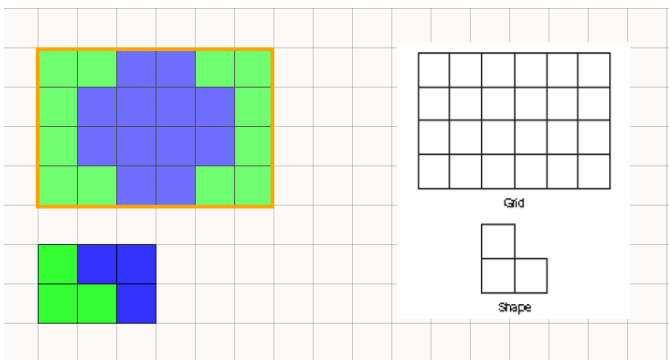
Use this new rectangular unit tile to cover the grid.



Reflect the rectangular unit tile up. (doubling)



Select the tiles on the left side of the grid (unitizing) and reflect them to the right to cover the grid. (doubling).



It takes four copies of the rectangular unit tile to cover the grid. Each of these rectangular unit tiles is made up of two original unit tiles. Notice this rectangular unit tile is proportional to the grid.

So, it takes $2 \times 2 \times 2 = 8$ original unit tiles to cover the grid. (multiplicative reasoning).