

# Draw like Escher!

- Instructions -

Following these instructions you can learn how to draw a tiling like the artist M.C. Escher.

**Step 1:** On the graph paper that comes with these instructions, choose a square that is 6 boxes wide and 6 boxes high (see Figure 1). We already know that this square will tile the plane. We will now modify the boundaries to get a more interesting tiling.

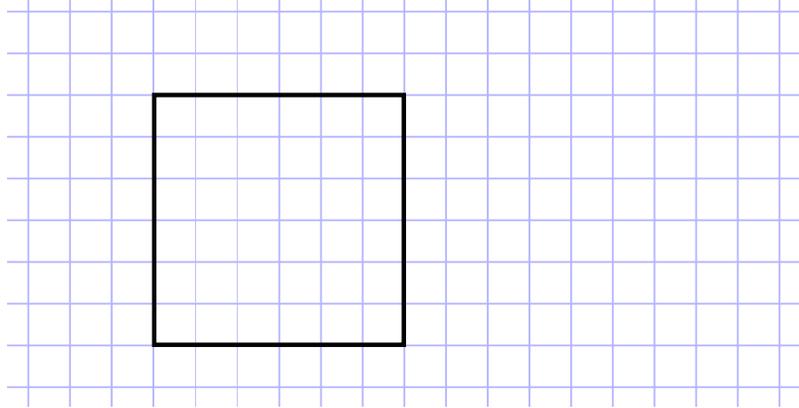


FIGURE 1. Choosing a square.

**Step 2:** Change the bottom side of a square to a line of your choice with the same endpoints (see Figure 2)<sup>1</sup>. For beginners it is best, if the line is not too complicated. Then change the top side of the square in the same way.

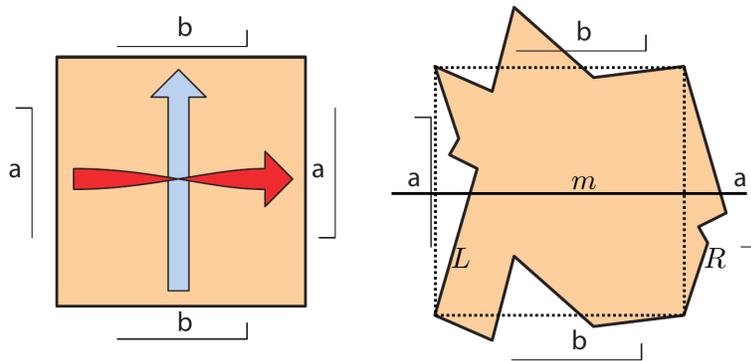


FIGURE 2. Modifying the sides.

**Step 3:** Change the left side of a square to a line  $L$  of your choice with the same endpoints (see Figure 2). Again, be careful not to draw a line that is too complicated. We then change the right side of the square to the same line, which we call  $L'$ , but draw it gently, as we will erase it in the next step.

<sup>1</sup>Figure 2 and 3 from Fathauer, R.: *Tessellations: Mathematics, Art and Recreation* (2021).

**Step 4:** Mirror the line  $L'$  on the right side of the square along the straight line  $m$  passing through the midpoints of the left and right side of the square to obtain a line  $R$  (see Figure 2). Then erase  $L'$ . The first unit of your tiling is now complete.

**Step 5:** To fill the paper, we now shift this unit up and down in vertical direction (see Figure 3). Passing to the right of the unit, we have to mirror it along the line  $m$  passing through the midpoints of the sides of our original square. Going left and right we alternate between the mirrored unit and the original unit.

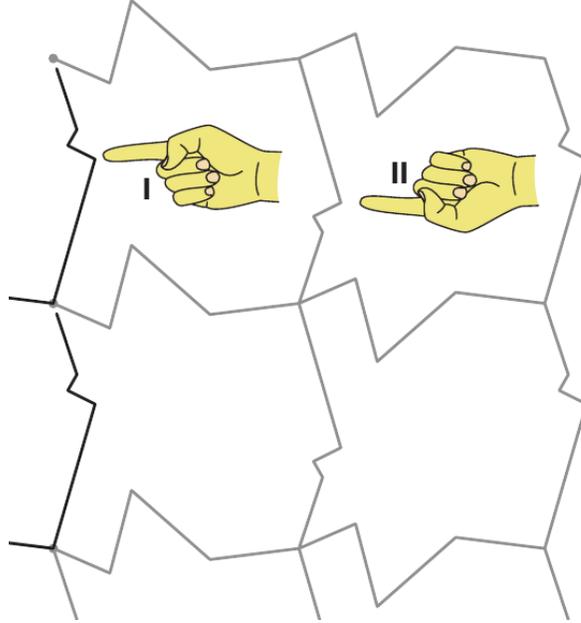


FIGURE 3. Filling the paper.

**Step 6:** Fill the units with a motive of your choice or a color (see Figure 4). You can use different motives for the unit and its mirror image. You can also modify the boundaries a bit to fit your motive.



FIGURE 4. Creating a motive.