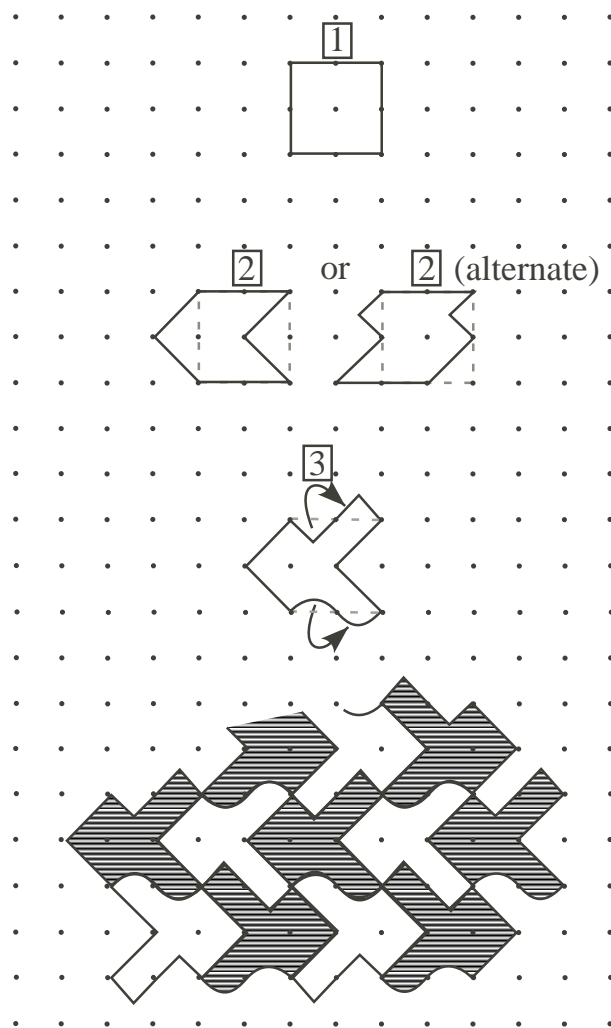


### Problem

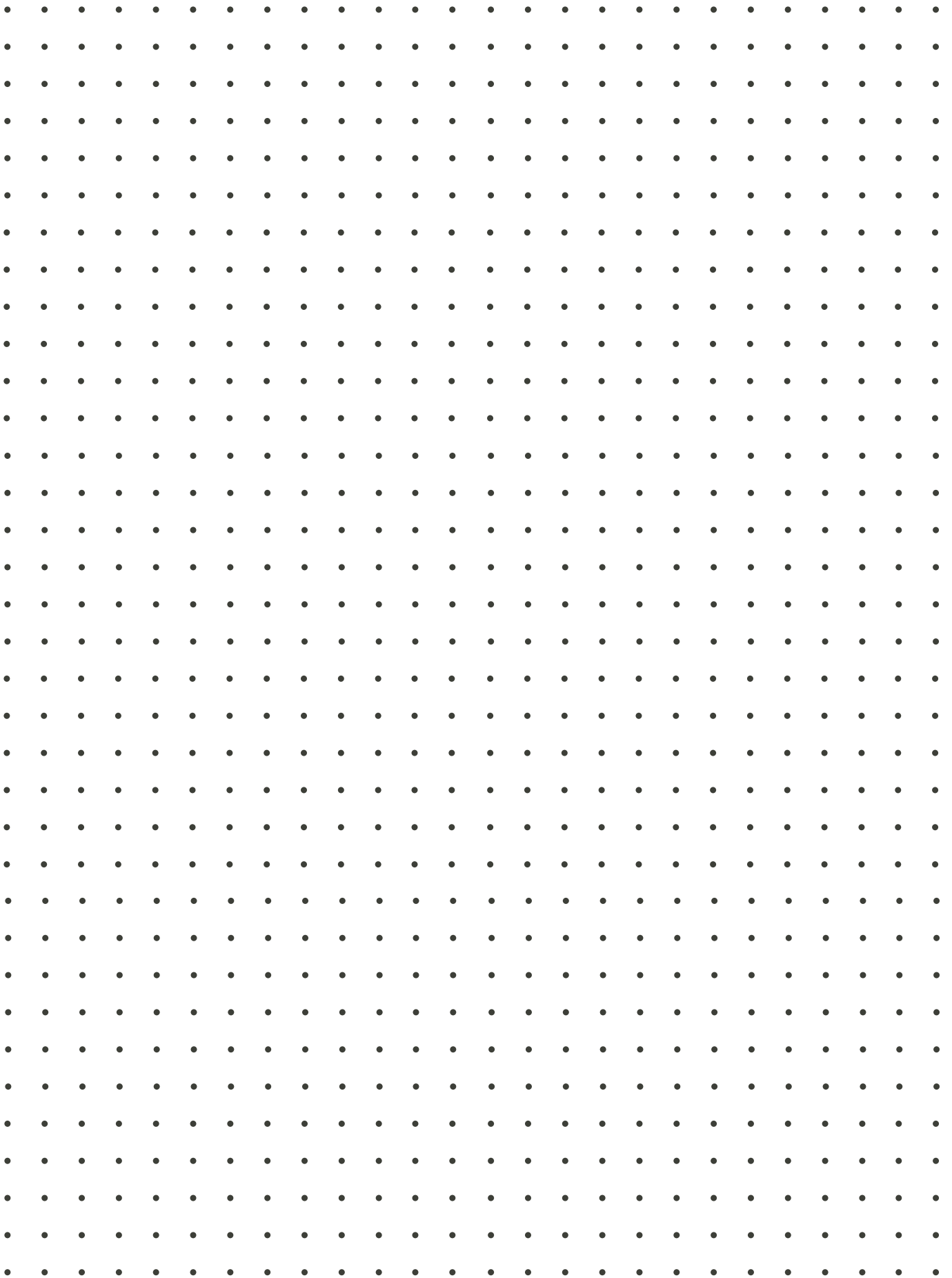
#### Tessellation Creation (Suggested for pairs or groups of students)

Working with your team members, create a tessellation of the plane by following the steps below.

1. Start with a simple shape that tessellates and has at least two pairs of opposite parallel sides (e.g., a square, parallelogram, or hexagon). (In the example shown, this is the square 1.)
2. Add a shape on one side (say, the left side), and remove it from the opposite side, to form figure 2. (In the example shown, triangles are added/subtracted.) Figure 2 will also tessellate. (Try it on blank piece of dot paper following this page.)
3. Working with another pair of opposite parallel sides, rotate a piece from half of one side of 2 by a half-turn about the midpoint of that side, and do the same on the opposite side (not necessarily using the same type of piece), to form figure 3. (In the example, we have rotated a triangle on the left half of the top side of figure 2, and a semi-circle on the left half of the bottom side.)
4. Finally, use figure 3 to tessellate the plane.



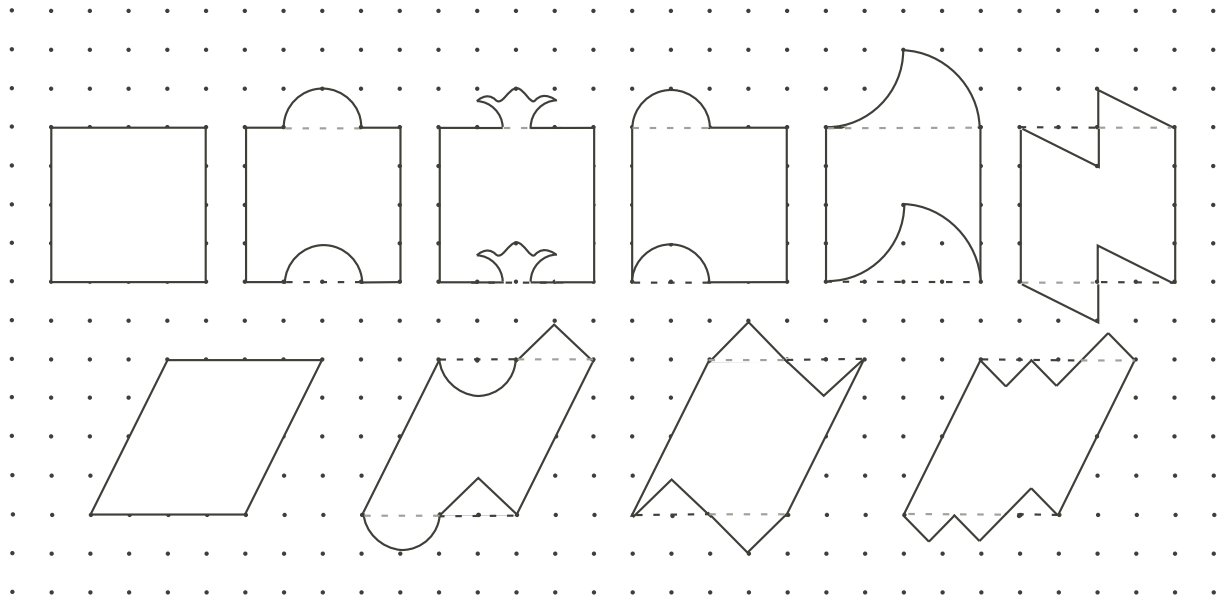
If you have trouble getting started, try doing just step 3, working on the given alternate Shape 2.




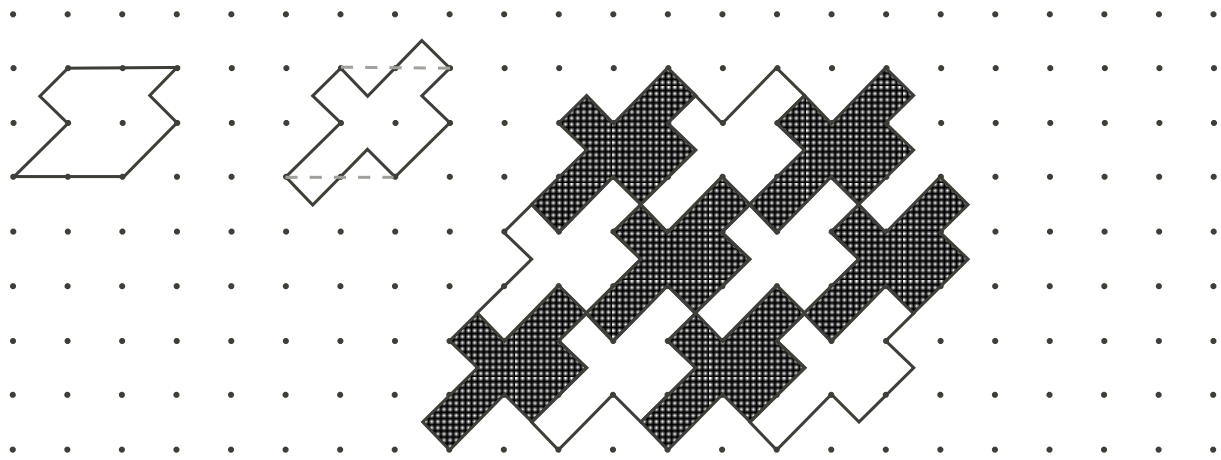
### Hints

*Suggestions:*

It may be beneficial to start with tessellations formed by re-shaping only one pair of opposite sides in an identical way. Here are some sample starters:



Once you have discussed the example given in the problem, you may also wish to use the alternate shape  as the basis for a second example. Here is one possibility:



This is a completely open-ended activity with a strong artistic component.

**Solution**

This problem offers limitless variation in solutions. Two possibilities have been offered in the original problem, and in the Hints above. Since drawing the tessellation may be challenging, students may want to discuss their initial attempts with one another or the teacher. Colouring can also be quite effective here... encourage creative play! You may also wish to explore the tessellations for symmetry.