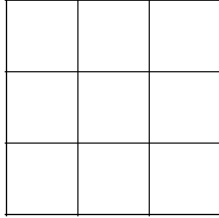


SYMMETRY CHALLENGE



How many symmetric patterns can you make by shading whole squares in a 3 by 3 grid?

HELP

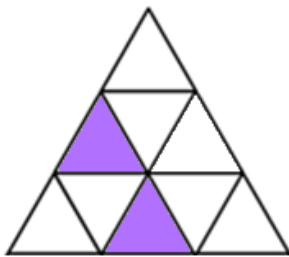
You could start with a 2 by 2 grid to help you to feel confident that you understand what to do.

NEXT

A simple extension: do any of the patterns have rotational symmetry?


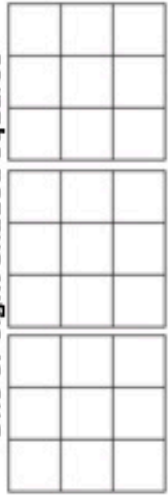
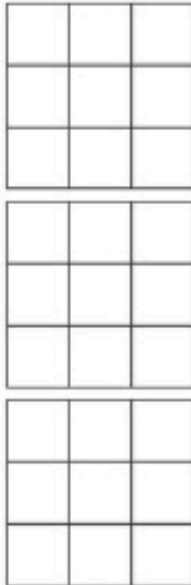
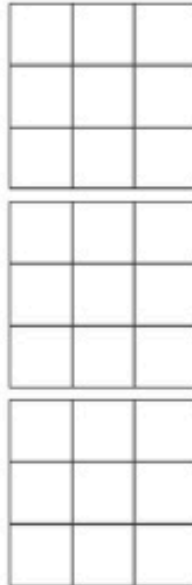
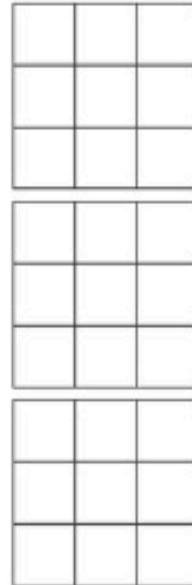
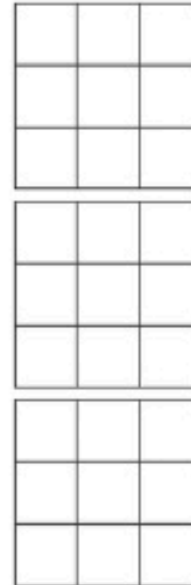
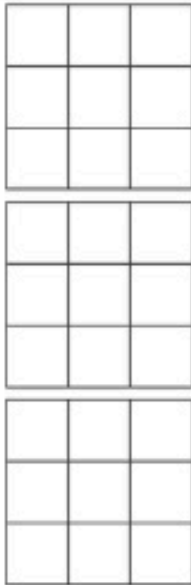
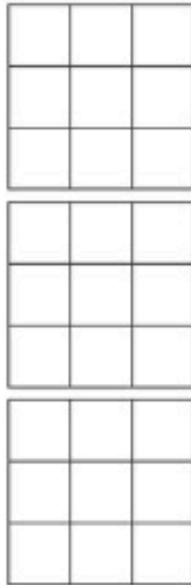
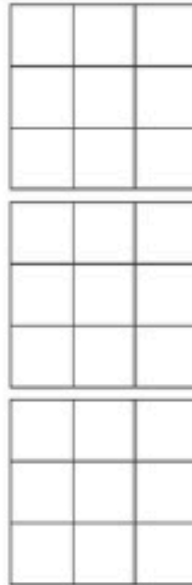
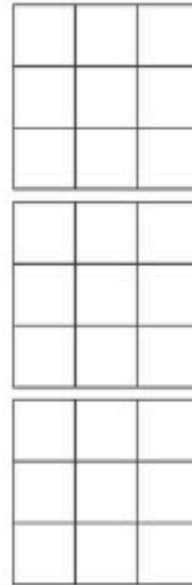
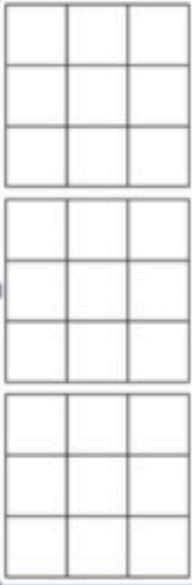
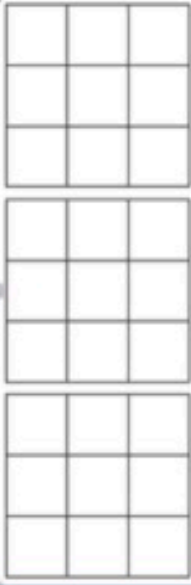
Use the chart on page 3 to fill in all possible distinct symmetric patterns.
There are 64 solutions.

The challenge can be extended to larger square lattices, e.g. 4 by 4, and to investigating whether there are any differences between even and odd lengths of side.



Shading symmetric patterns in an isometric grid is another possibility.

SYMMETRIC PATTERNS IN A 3 BY 3 GRID

<p>Zero or nine shaded squares</p> <div style="text-align: center;">  </div> <p>One or eight shaded squares</p> <div style="text-align: center;">  </div>	<p>Three shaded squares</p> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <p style="text-align: right;">or 6</p>	<p>Four shaded squares</p> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <p style="text-align: right;">or 5</p>
<p>Two shaded squares</p> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <p style="text-align: right;">or 7</p>		