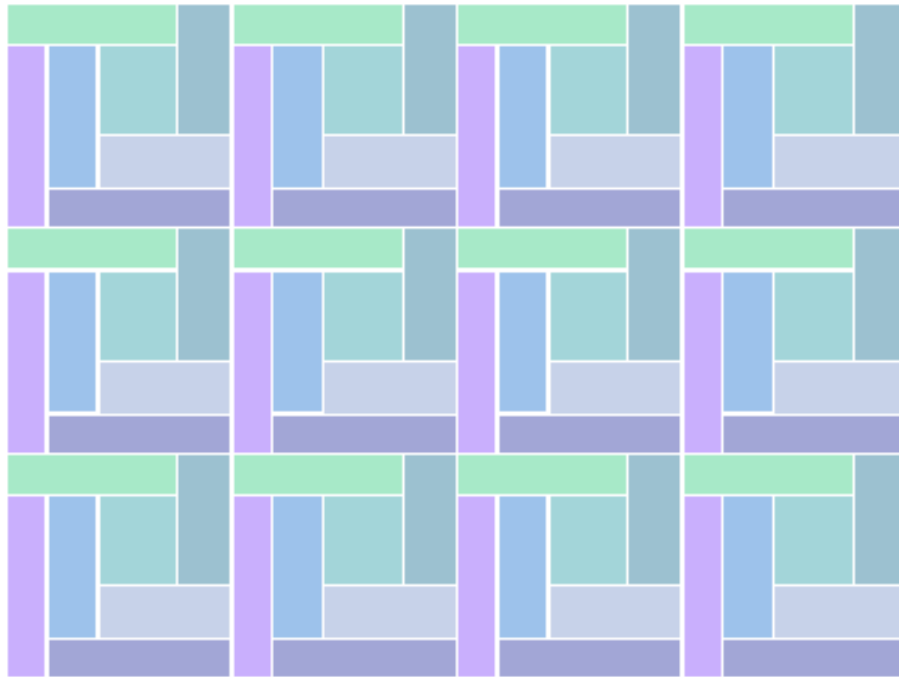


Tiling on Titan

The Wise Women of Titan want to re-tile the enormous rooms of their palace using rectangles, but for aesthetic reasons they do not want identically shaped rectangles to touch at any point. Show how they can tile their rooms using only 3 different kinds of rectangular tiles.



Just for interest, the old floor tiling used 7 different kinds of rectangular tiles, all of the same area but different perimeter.

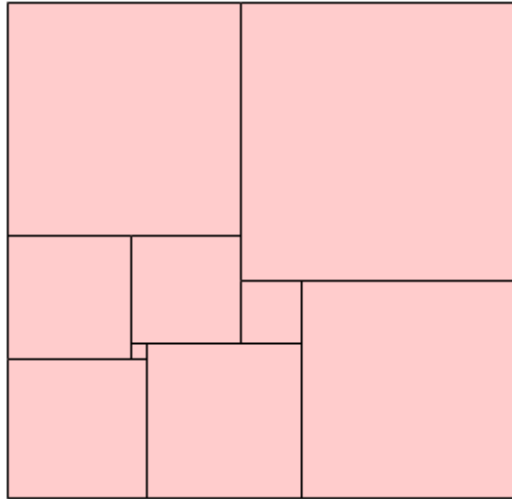
Just as they were about to begin the tiling, one Wise Woman of Titan stopped them and said: "We can do even better than this if we were to use equilateral triangles!"

Find a pattern using 2 sizes of equilateral triangles so that no two identical triangles touch along an edge.

Extensions:

- How many different equilateral triangles do the Wise Women of Titan need to tile a room if no two may touch along an edge or at a point?
- Another Wise Woman of Titan just wanted to abandon the tiling of the large rooms altogether, and concentrate on tiling her cat's litter box with squares. If no two identical squares can touch at an edge or point, and the cat's litter box is square, find a pattern that will work.

- These nine squares have sides 1,4,7,8,9,10,14,15, and 18, but this arrangement won't work (can you see why?)



The Math in This Problem:

There are over thousands of tile patterns to choose from but in this case, the Wise Women of Titan do not want identically shaped rectangles to touch at any point, or two identical triangles to touch along any edge. This math puzzle introduces puzzlers to the world of tiling, and the important role that shapes play in creating tile patterns. Students must apply their knowledge of rectangles and triangles, and analyze these shapes to fulfil the Wise Women's requests.