



It is known that trapezoids consisting of 1, 3, and 5 equilateral triangles in a line can tile an equilateral triangle.

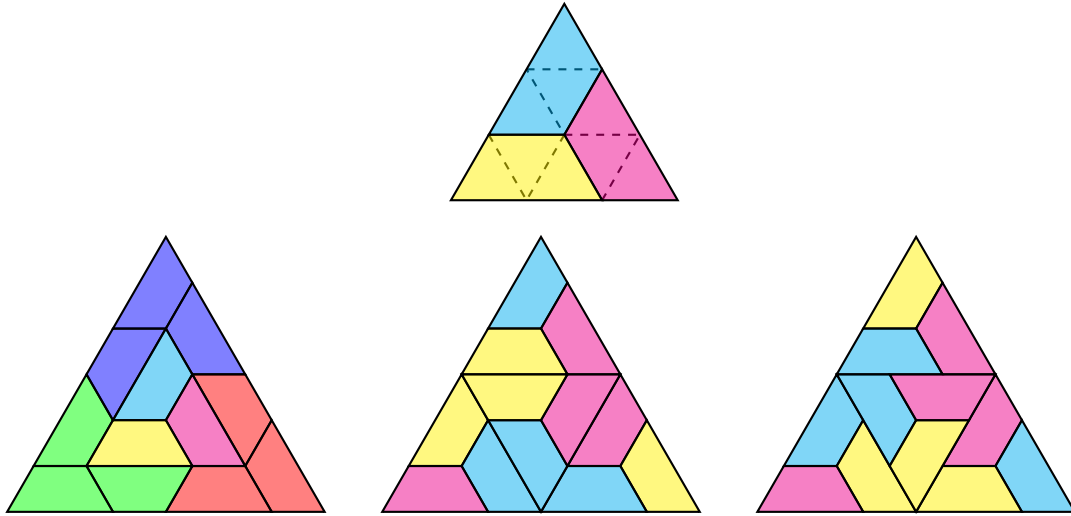


Figure 1: A equilateral triangle made of 3-trapezoids.

**Question.** Can all trapezoids (that are made out of equilateral triangles) be arranged to form an equilateral triangle?

**Related.**

1. What is the smallest triangle that can be formed this way?
2. Is there a construction that makes such triangles given some  $k$ -trapezoid?
3. How many such tilings exist for a given size trapezoid and triangle?
4. Can other shapes be tiled (e.g. hexagon, arbitrary trapezoid)?
5. Does this generalize to square/hexagonal tilings? Multiple dimensions?

**Note.** If  $c(n)$  counts the number of distinct minimal covering sets of  $n$ -ominoes, then  $c(1) = c(2) = c(3) = 1$ ,  $c(4) = c(5) = 2$ , and  $c(6) = 14$ .

**References.**

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<https://math.stackexchange.com/q/2215781/121988>