

Tilings of the plane

According to Wikipedia, “A *tessellation* of a flat surface is the tiling of a plane using one or more geometric shapes, called tiles, with no overlaps and no gaps.” Most people are familiar with tessellations from the tiles in their bathrooms and kitchens.

Exercise 1. Give at least two examples of a tessellation of the plane.

Exercise 2. Why do equilateral triangles tessellate? Do other triangles tessellate? Which ones?

Exercise 3. Can quadrilaterals that are not parallelograms tile the plane? Which ones? In more than one way?

Further exploration. Which regular polygons tile the plane? One could also allow more than two regular polygon types (e.g., can you tile the plane with regular 4- and 5-gons?). Alternately, one could try to figure out if there are any 5-gons that tile the plane. (The house shape is easy, can you find others? How many?) What about hexagons, do they need to be regular in order to tile? If not, can you find examples?