


Tessellations

An extension of "Creating magical art from mathematics"

A **tessellation** is created when a shape is repeated over and over again covering a plane without any gaps or overlaps. There is no limit to the number and variety of patterns that can be created by tessellating one or more geometric shapes. Turn to page 12-13 of *What's Up* October 2016 to see how M. C. Escher played around with tessellations to create unreal buildings and enchanting patterns.

INSTRUCTIONS

- 1) On a sheet of paper list:
 - a. Some geometrical shapes that tessellate.
 - b. Some tessellations we see in our world (e.g. rectangular bricks of a wall).
- 2) Design an Escher-inspired mug:
 - a) Using a ruler and pen, join the dots 1 to 50 in the ascending order to discover one of Escher's curious tessellation templates. This single piece is called a block. When used repeatedly by fitting it together without gaps, it creates a tessellation. This is your template.
 
 - b) Glue a 3-inch square cut-out of a card paper to the back of the template, to make it firm. Then cut out the block after the glue has dried.
 - c) On a separate sheet of paper, practise creating a tessellation using this block thrice.
 - d) Next, clean a white ceramic mug with an alcohol wipe and tape the block gently to the mug using double-sided tape. Make sure it is taped such that the block can be used at least 3 times.
 - e) Trace the outline of the block on to the mug with a black or coloured pen which can write on any surface, or a permanent marker.
 - f) Gently peel off the block and repeat steps (d) and (e) at least thrice to form a tessellation.
 - g) Fill in the outlines with colour to bring the design to life. Leaving it as a thick outline also looks great.
 - h) If you've used special pens, allow the ink to dry thoroughly for 24 hours. Ask an adult to pre-heat an oven to between 150°C to 200°C, and bake the finished mug for an hour. Once out of the oven and cooled, you have a self-designed mug.

**Note: You can find pens that can write on porcelain, ceramic, cloth and other surfaces at any big stationery or art-supply shop.*