Tessellations and Tilings

Directions

Step 1: Design an original, interesting tessellation or tiling. It may be based on any transformation group. You will submit a rough copy of the tessellation.

Step 2: Make a line copy (no coloring, just the edges) of the tessellation.

For tessellations: Choose one piece as the generating piece. Show how the rest of the copies are obtained from the generating piece by using linear arrows to indicate translation, circular arc arrows to indicate rotation, < | > symbol for reflections. Note distances and angles for translations and rotations respectively.

For tilings: Find a collection of shapes that is a single generating piece for the tiling. Perform the above procedure on this shape.

Step 3: Describe the minimum set of transformations (minimal generating group) which generate the complete tessellation or tiling.

Step 4: Describe all transformations under which your tessellation or tiling remains constant. Do this for the colored and non-colored versions.

Step 5: Produce a quality, colored version of the tessellation or tiling.

Grading

Steps 2, 3, and 4 are each worth 5/20’s of the grade. Step 5 is worth δ5/20’s of the grade where δ is a multiplier for difficulty and creativity.

Everyone begins with δ=1.00. Generation of a non-simple tessellation shape (something other than a colored polygon) add 0.05. Production of the final project by hand (colored pencil, crayon, collage, etc.) adds at least 0.05. More is added for the difficulty of the method.