

Ink-Less Tessellation Prints

Think printmaking requires ink? Think again!

(art + math)

M.C. Escher (1898–1972) produced some of the world's most beloved prints and drawings, including a number of geometric tessellations inspired by mosaic tiles he observed while visiting Spain.

A tessellation consists of one or more geometric shapes (called tiles) that repeat on a plane without overlapping or leaving negative space between repetitions. Very simple tessellations would be the repeating hexagons found in a honeycomb or tiled flooring. Escher created more artistic tessellating shapes of animals, birds, and fish.

While designing a tessellation requires planning and creativity, making the repetitive print is easy with this new process.

A transparent printing plate is cut and scratched with the design, then impressed onto paper in a repeating pattern. It's easy to place the design and avoid overlaps or gaps between prints because of the transparency of the plate.

Etching or intaglio ink may be used, but, for an easy and tidy means of creating multi-colored tessellating prints, try "coloring" on the plate with a watersoluble crayon or pastel. The waxy color applies directly to the scratched design and releases when pressed onto dampened paper. The prints are imperfect and intriguing.

GRADES 5-12 Note: Instructions and materials are based upon a class size of 24 students. Adjust as needed.

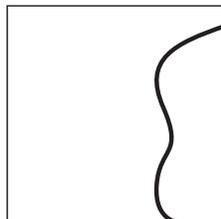
Preparation

1. View tessellating patterns found in nature and manmade design. Visit MCEscher.com to see a gallery of Escher's symmetrical patterns.
2. Cut monoprint plates into six 4-1/2" x 4" pieces.

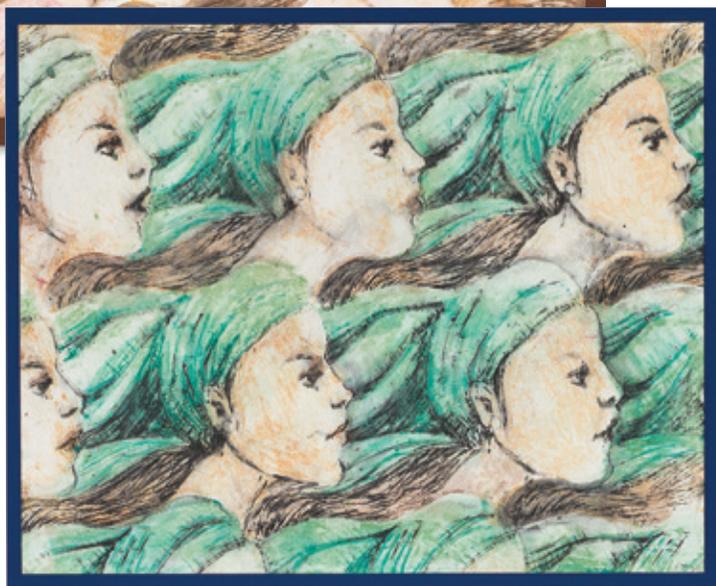
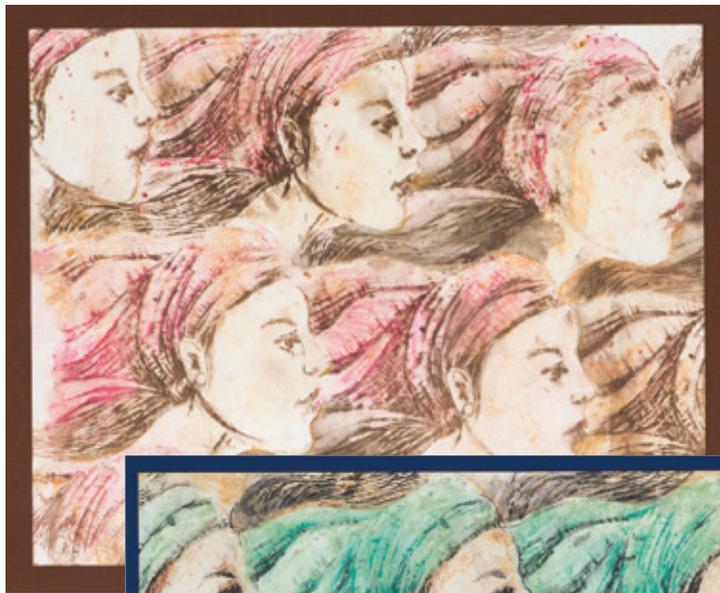
Process for Making a Tile for Tessellation

1. There are many formulas for creating tessellations. Starting with a shape that already tiles perfectly, such as a square, rectangle, or triangle, provides a base to start with.

For instance, start with a square and draw a line on one side; see example (A). It doesn't need to fit perfectly within the square or go from corner to corner.



(A)



Materials (required)

- Graphix® Impress Monoprint Plates**, 9" x 12" package of 3 (47182-1023); share one plate among six students
- Caran D'Ache® Neocolor II® Artists' Crayons**, assorted colors (20042-); share across class
- Sharpie® Ultra-Fine Point Marker**, Black (21315-2003); share one between two students
- Scratch-Art® Knives**, curved (14901-0000); need one per student
- Standard Pen Holder**, for Scratch Knives (22930-0000); need one per student
- Strathmore® 400 Series Printmaking Paper**, pad of 20 sheets, 8" x 10" (13825-1012); need one sheet per student
- Blick® Scholastic Golden Taklon Flat Wash**, size 1/2" (05859-4012); one per student

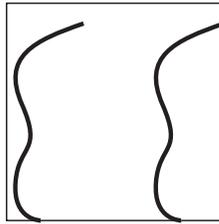
Optional Materials

- Portfolio Series® Watersoluble Oil Pastels** (20049-3009)

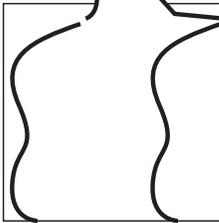


Process for Making a Tile for Tessellation

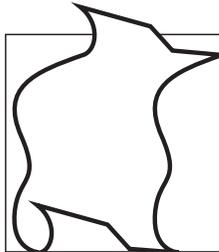
2. Next, repeat the same line on the opposite side of the square; see (B). Using a digital design program makes this very simple. If technology is not available, tracing paper works well.
3. Create a second line at the top of both lines (C) and repeat it at the bottom (D).
4. The shape is now a tile that can be used in a tessellation. Print or trace the image multiple times to make preliminary sketches of the design. Look at the shape from all angles. The example shape looks like a bird, but when turned upside down, it becomes a cat. From side views, it may be a flag or a music staff.



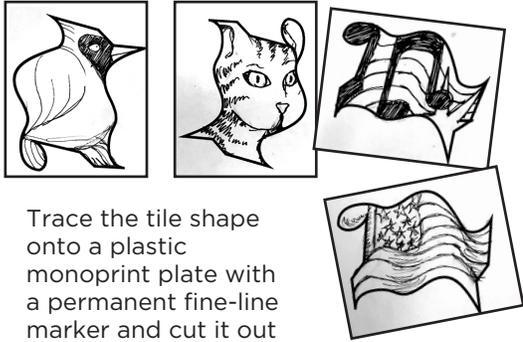
(B)



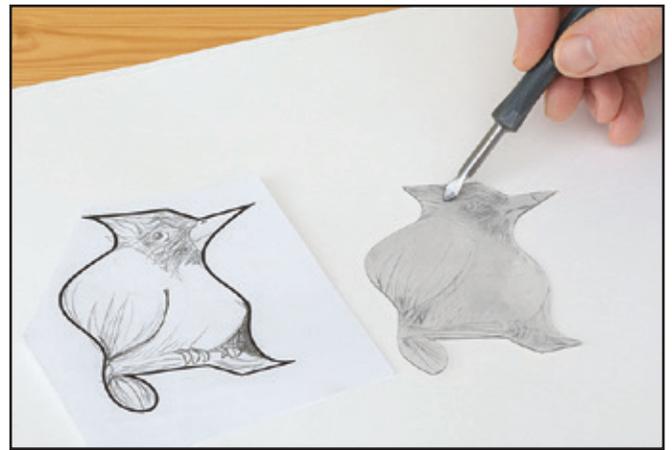
(C)



(D)



5. Trace the tile shape onto a plastic monoprint plate with a permanent fine-line marker and cut it out with scissors.



Step 1: Create a tile for tessellation using the process described in steps 1-5. Using a metal scratch-art tool, add details to the tile.



Step 2: Add light colors to the tile plate with watersoluble pastels. On damp paper, make a print using a baren to apply pressure.



Step 3: Fill the paper with tessellating prints, using the transparency of the plate to create proper placement with no gaps or overlaps.

Process for Ink-less Printmaking

6. Scratch details of the design into the tile plate using a metal scratch tool. It may be placed over the sketch and traced. Keep in mind that the print will be reversed.
7. Use a watersoluble crayon or pastel to color the design directly on the tile plate. For best results, don't try to print all of the colors at once. Begin with one or two light colors and add dark colors in subsequent printings. Use a lint-free rag (old t-shirts work great) to smooth color, push it into the scratched lines, and remove it from areas that will remain unprinted.
8. Prepare the paper for printing by soaking it in a tray of water. Blot until the paper is damp, not wet. For best results, make a test print on a scrap of paper to determine the right amount of water and pressure to use. The color may need to be reapplied following a test print.
9. Position the tile plate in the center of the paper and hand-print using a baren and heavy pressure. If the tile is larger than the baren, hold the tile to keep it from moving and apply pressure to all areas of the print.
10. Lift the tile plate and reposition it either horizontally or vertically next to the first print so it fits next to it with no overlap and no gap between prints. Use the transparency of the plate to align correctly. Apply pressure with the baren to make a second print.

Depending on the amount of color on the plate, the dampness of the paper, and the pressure applied, multiple prints may be possible before color needs to be reapplied.

Continued on next page



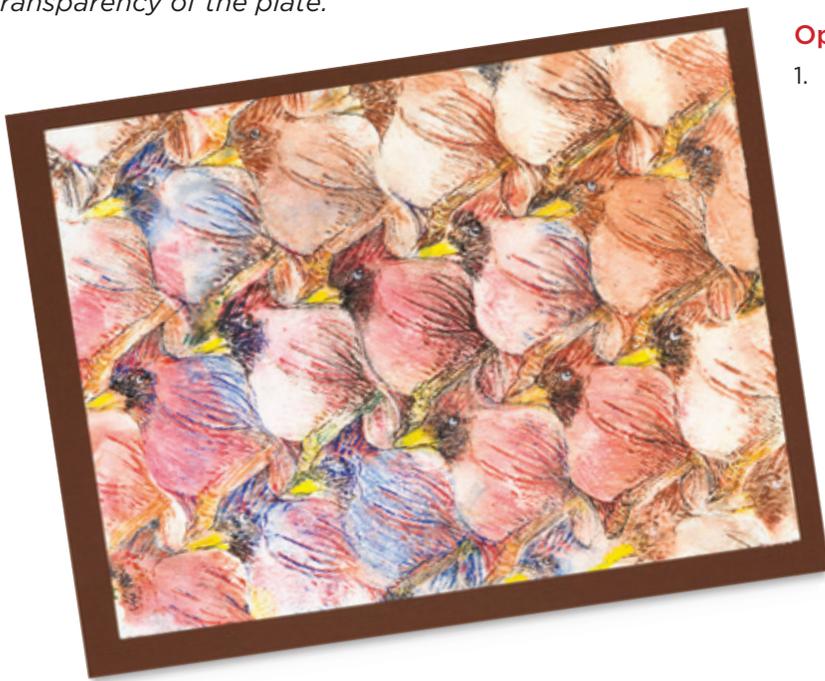
Step 4: Clean the tile plate and repeat with more color. Brush water lightly over the first print before applying, and register the second print using the transparency of the plate.

Process for Ink-less Printmaking, continued

11. Fill the sheet with tessellating tiles. If the paper becomes too dry, brush water over the surface before making a print. When the edge of the paper is reached, place scrap paper or paper towels underneath to make sure the overhanging portion does not print on the work surface.
12. Clean the tile by rinsing thoroughly with water before making a second color tessellation. To apply color on top of the first print, lightly brush water over it, then use the transparency of the tile plate to register the plate before applying pressure. Too much water and pressure with a brush will disturb the first print, so keep it light.

Multiple layers of color may be applied over each print, as long as they are applied from light to dark. Color choices may be altered so that prints are not all the same color. Save black and other dark colors for last.

NOTE: Prints will be imperfect, but the inconsistency imparts an appealing quality to the overall look of the tessellation. With practice, greater control over the print quality can be achieved.



Options

1. Ink-less multi-color or monochromatic prints without tessellation can also be created with this process, see examples below.



National Core Arts Standards - Visual Arts

Creating

Anchor Standard 2: Organize and develop artistic ideas and work.

Presenting

Anchor Standard 5: Develop and refine artistic techniques and work for presentation.

Responding

Anchor Standard 7: Perceive and analyze artistic work.

Connecting

Anchor Standard 11: Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding.