

CREATE A TESSELLATION

Grades 4–8

- ☒ total group activity
- ☒ cooperative activity
- ☒ independent activity

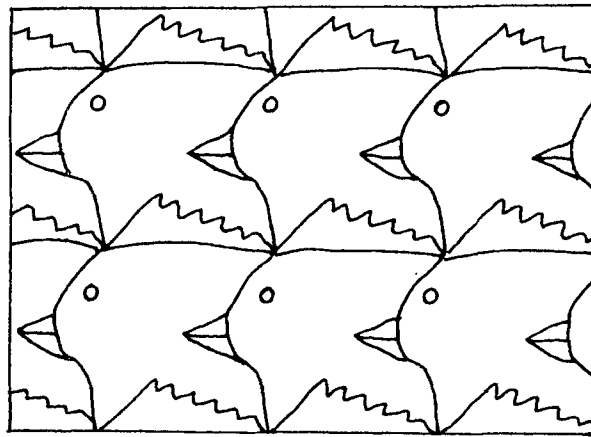
- ☒ concrete/manipulative
- ☒ visual/pictorial
- ☒ abstract procedure

Why Do It: To allow learners to explore regular tessellations and then to create M. C. Escher-type tessellations of their own.

You Will Need: A large sheet of light-colored drawing or construction paper that is fairly stiff; a small square of tagboard (about file folder weight) which measures $2\frac{1}{2}$ inches on a side; tape; pencils; scissors; rulers; and colored markers. Some examples of Escher-type tessellations (from encyclopedias, other resource books or art files) may also prove to be helpful.

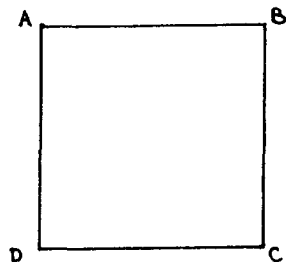
How to Do It:

1. Initially the learners might search out and explore the many regular tessellations that are found in everyday locations. (*Note:* A tessellation of a geometric plane is the filling of the plane with repetitions of a figure in such a way that no figures overlap and there are no gaps.) Such everyday tessellations are most often made with regular polygons as squares, triangles and hexagons; for example, ceramic tile patterns on bathroom floors, brick walls, or chain link fences.

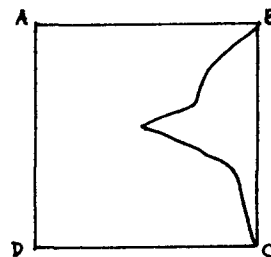


2. Next, explore some examples of the Escher-type tessellations and tell the participants that they will be learning the logical procedures for developing similar tessellations of their own. When ready for the construction phase, it is suggested that everyone work together as they create their first tessellations; that is, the participants (even though they will likely use different designs) should complete Step 1 together, then Step 2, etc. These steps are outlined in the Example below.
3. Following completion of their first tessellations, engage the participants in a discussion of the “motion” geometry that they accomplished. In this instance they cut out segments and then used a “slide” motion to move them to their new location. (In other instances of “motion” geometry, such cutout segments might be “flipped,” “turned,” “stretched,” or “shrunk.”) As such, this discussion, involving the logic of creating tessellations, should include questions as, “What happens when you _____?” and “What might happen if _____?” Finally, allow the participants to try out some of their ideas as they attempt to create more tessellations.

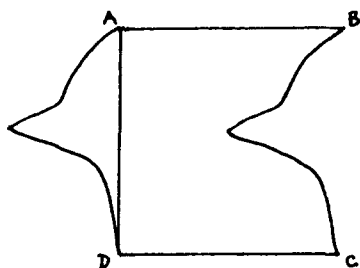
Example: To create your first tessellation follow the steps noted on page 226.



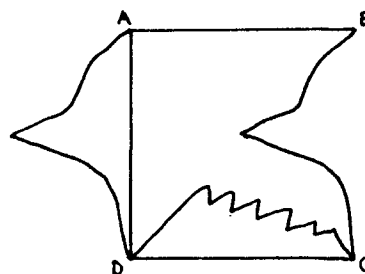
Step 1: Label your tagboard square A, B, C, D as shown.



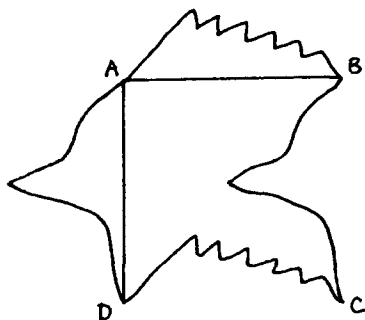
Step 2: Draw a continuous line that connects vertex B with vertex C and cut along that line.



Step 3: Slide the cut-out piece around to the opposite side, place the straight edge BC against AD, and tape them together.



Step 4: Draw a continuous line that connects vertex D with vertex C and cut along that line.



Step 5: Slide this cut-out piece around, from the bottom, and place it on top, with the straight edge DC against AB and tape them together. Your tessellation pattern is now complete.

(Note: See the completed bird-like tessellation on page 225.)

Step 6: Place the pattern on your drawing paper and trace it. Then slide the pattern (up, down, left or right) until it is against a matching edge and trace again. Continue until the entire drawing paper is filled with repeating patterns. You may use colored markers to emphasize your tessellation pattern.

Extensions:

- 1.** The students might create tessellations to depict important events, holidays, etc.
- 2.** Create tessellation book covers, laminate or protect them with clear self-stick vinyl, and mount them on the participants' personal or school books.
- 3.** Create a large tessellation (beginning perhaps with a 2½ foot piece of cardboard) and cover an entire wall.