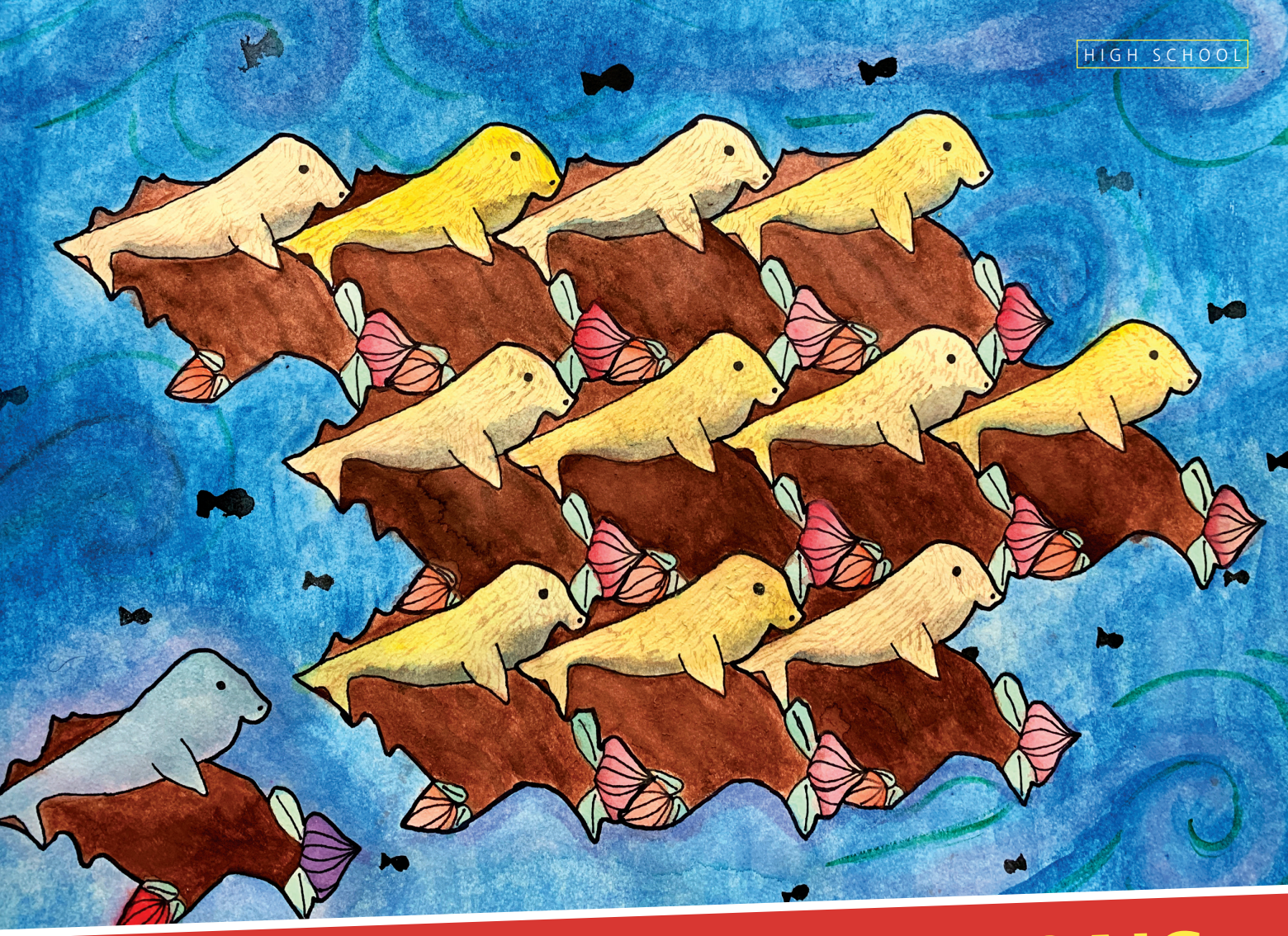


# GRIDLESS TESSELLATIONS

Eric Gibbons

Tessellations have great connections to math and geometry, and they can be fun, but they can also become tedious and mechanical. By going beyond the basic square and rudimentary gridding techniques, students can breathe new life into tessellations and even find opportunities for self-expression.

When creating tessellations, most people primarily work with squares, but did you know that many of the same techniques work just as well with rectangles? We've been told to "line up the corners," but for many tessellation techniques, you don't have to. Experimentation is something we can do more of in our classes. After all, it's innovation that fuels STEAM education.

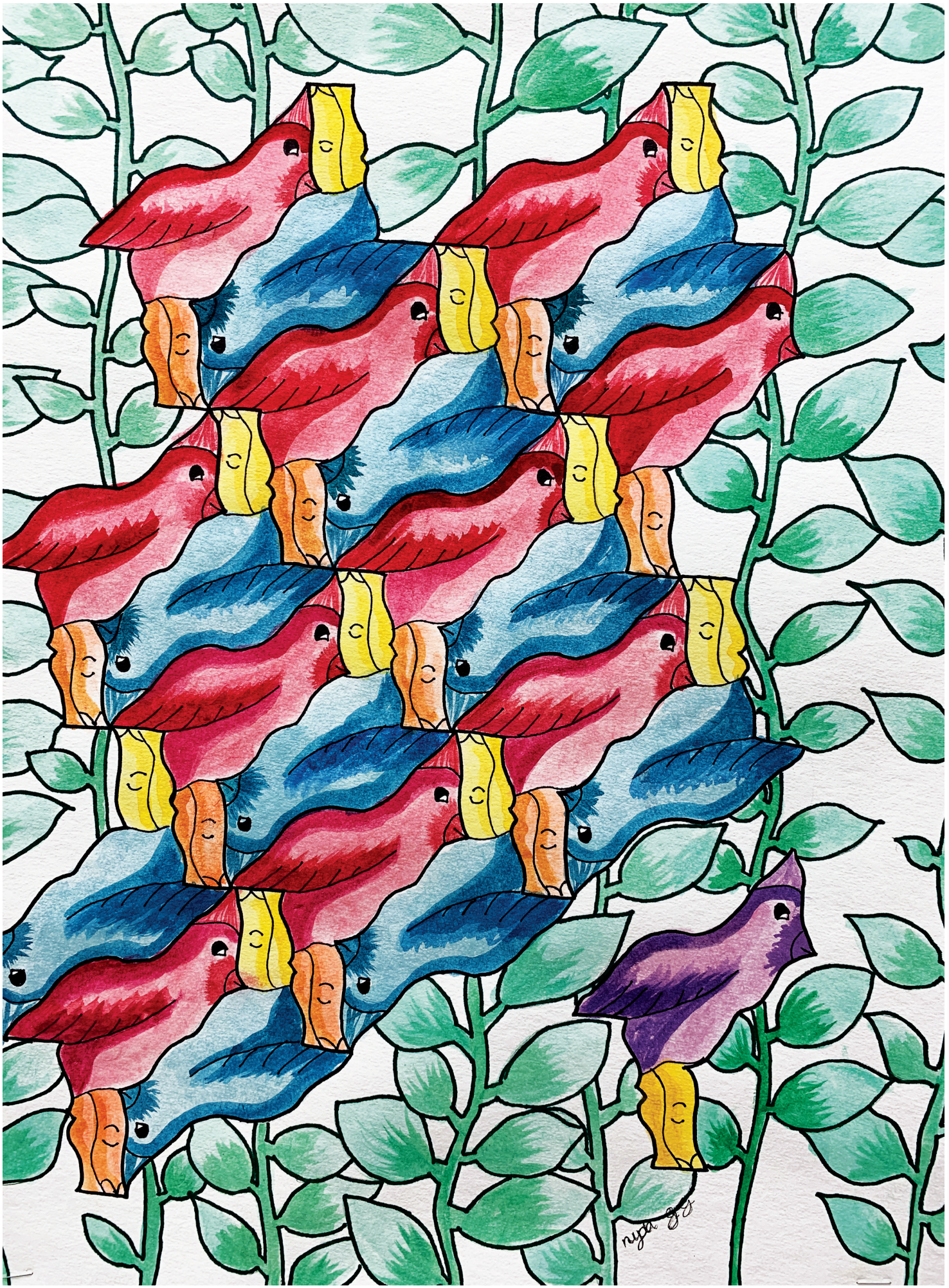
## Off the Grid

The translation method is the most common for tessellations. Draw and cut a shape from one corner of a small square of paper to an adjacent corner, move the cut shape to the other side of the square and tape the shapes together. Do we really need to match up the corners before taping? No! Try it for yourself. Then trace your new shape in the middle of a sheet of paper and continue to surround it with more figures. You'll end up with a more organic composition that looks more like art and less like wrapping paper.

We often fall back on the grid method to tessellate our figures. This forces constraints on the shapes and results in a narrow, too-repetitive range of potential subjects. But if we can pull back from the corner-to-corner restrictions, we end up with many more Escher-like possibilities.

## Reflection and Rotation

The reflection technique, where you flip your cut shape before reattaching



it, results in more dynamic figures, too. Again, the corners do not need to match up for this to work. It's a bit like a challenging puzzle at first, but it works, and the results are more lively.

You can go even further with parallelograms, hexagons, and triangles. The rotation technique produces a broad array of delightful organic shapes. For a series of tutorial videos showing these tessellation techniques, see the Resource below.

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**Limitless Possibilities**

I encourage you to have students make ten tessellations for each technique mentioned. In that way, when they are done, they truly know how to make tessellations, and they'll have a large pile to sort through. They should look at all of their shapes against a contrasting background so the contours really pop. Ask them to turn the shape, look at it from the front and back, and share their results with peers for feedback. They should draw right on the shapes and focus on whole figures as opposed to partial objects.

**Personal Expression**

Once students have created a large selection of tessellations, ask them to identify the strongest examples. When a choice has to be made, ask, "Which figure has a personal connection to who you are?" If it's a choice between a bird and a turtle, a bird might be considered more adventurous, while a turtle might be seen as more of an introvert. Which one can the artist relate to most? This should be the final decision maker because it will add another layer of expression to the work. And isn't that what art is all about?

In the student artworks shown here, we used heavy watercolor paper, watercolors, and ink. Students worked in pencil first, then pen, and finished with watercolor in three steps:

1. Give all shapes a light color.
2. Add shadows and highlights to each.
3. Add textures and patterns where appropriate.

You can see that by letting go of the grid, students have created a very dynamic selection of artwork.

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NATIONAL STANDARD

*Connecting: Synthesize and relate knowledge and personal experiences to make art.*

RESOURCE

Tessellation YouTube Tutorials: *bit.ly/ArtSHAPES*

*First page: A seal tessellation created using the translation method. Previous page: A bird and vine tessellation created using the rotation technique. This page, left: These lions were created using the rotation technique. Right: Students first work in pencil and pen, then finish with watercolor.*