

OPINION BLOG

Classroom Q&A

With Larry Ferlazzo

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TEACHING OPINION

Strategies for Using Art in Math, English, Science, and History



By [Larry Ferlazzo](#) — October 25, 2021 ⌚ 13 min read





Larry Ferlazzo

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Larry Ferlazzo is an English and social studies teacher at Luther Burbank High School in Sacramento, Calif.



(This is the second post in a three-part series. You can see Part One [here](#).)

The new question-of-the-week is:

What are the best ways you have used art in lessons?

In [Part One](#), Wendi Pillars, Keisha Rembert, Delia M. Cruz-Fernández, and Irina McGrath, Ph.D., offered their suggestions. Wendi, Keisha, and Delia were also guests on [my 10-minute BAM! Radio Show](#). You can also find a list of, and links to, [previous shows here](#).

Today, Sara Rezvi, Gretchen Bernabei, Jeremy Hyler, and Kelsey Pycior share their recommendations.

Art & Math

Sara Rezvi (@arsinoepi on twitter) is a former high school mathematics teacher, a current doctoral candidate at the University of Illinois at Chicago in the College of Education, and the program director of the Math Circles of Chicago, a nonprofit organization that seeks to provide equitable access to rich and thoughtfully designed mathematics outside regular school hours for all children:

Are you a math teacher? How often do you get the following comments when introducing yourself to others?

- *Math? Oof, I'm just not a math person.*
- *Wow, you must be really smart.*

As a former high school mathematics teacher and a current doctoral candidate studying mathematics curriculum and instruction, I find these responses deeply saddening. The first suggests that mathematics was something that was done TO the person speaking rather than in community with, and the second response suggests that math continues to remain a proxy for intelligence. Either way, the internalized message I hear from these types of responses is clear: Mathematics is a playground for some, not all.

But what if it's not mathematics that's the issue here, but the standard approach in how mathematics has been exceptionalized and taught in the United States?

In our paper, [*Radical Love as Praxis: Ethnic Studies and Teaching Mathematics for Collective Liberation*](#), my co-authors, Cathery Yeh, Ricardo Martinez, Shraddha Shirude, and I argue how ethnic studies and mathematics engage in reimagining what spaces of mathematics built in community, solidarity, and love might look and feel like.

One of the ethos we describe in our paper is related to the concept of community and solidarity, where we define the following:

“Community and Solidarity in mathematics, as defined by ethnic studies, see mathematics as integral to activist movements for social justice. Ethnic studies is a process that connects learning to the community and to the real world, acknowledging the situated, and body, and Collective nature of learning and change. Mathematics learning is not just experienced cognitively; it is a process that has lived, engraved in students’ bodies and memories, and shaped by our histories, ancestors, and communities.” (Yeh, Martinez, Rezvi, Shirude, 2021, p. 82)

What if mathematics was embodied in the K-12 classroom space? What if it was poetic? What if it was seen as beautiful by our society rather than something to overcome or get through in schooling? What if?

Francis Su (@mathyawp) discusses this in the quote below from his book, *Mathematics for Human Flourishing*:

Photo Credit with permission of Francis Su

What if we celebrated and explored mathematics through art?

In this post, I offer one approach of doing so by exploring Islamic geometry with students that centers the idea of exploration, joy, and solidarity [with Muslim students who have and may continue to be experiencing an increasingly hostile climate due to racism, xenophobia, and white supremacy.](#) As educators, it is our collective responsibility to ensure that *every child* that walks into our classroom space is welcomed and cared for, is seen and heard, and is celebrated in the fullness that they bring. Math class is no exception.

A scroll through the [geometry common core standards](#) most math teachers incorporate into their lesson plans reveals language describing students exploring such concepts as symmetry, tessellation, congruency, similarity,

and composition. What if art could lend itself in exploring these geometry standards? I describe below an example of this vision through the lens of Islamic geometry.

What do you notice? What do you wonder in the images above? The beautiful tile work you see photographed here is from the [AlHambra](#), the 13th-century palace and fortress constructed by Narsrid emir Mohammed ben Al-Ahmar. For more insight, John Jaworski's insightful book, [A Mathematician's Guide to the AlHambra](#) was a rich resource for creating my lesson.

Students were then invited to go on a [virtual field trip](#) in small breakout rooms of the 600-year-old Mosque of Sultan Barquq in Cairo. I encourage you to do the same. The link is remarkable, and students enjoyed being able to go on a field trip under COVID lockdown when I first delivered this lesson in the summer of 2020.

What patterns did you see? What geometries are beginning to emerge? Why do some polygons tessellate and others do not? Can we find a way to bring a mathematical lens to the beautiful art we've just seen?

Indeed, [Maryam Mirzakhani's](#) daughter described her mother's work as painting! The recently published [children's book](#) by Megan Reid and illustrated by Aaliya Jaleel celebrating Mirzakhani, the first Iranian and woman Fields Medalist, is chockful of ways of understanding how math and art are intertwined.

These questions and more were facilitated during this exploration, where students' curiosities were piqued by the artwork they had been exploring. The art leads to the mathematics. The mathematics leads to the art. In this way, they are connected. It is a conversation and an invitation to see a subject that has been sterilized by high-stakes testing into something anew.

Annie Perkins ([@anniek_p](#)) has a gorgeous series of #mathartchallenges that she has curated on her [website](#). The Islamic geometry lesson can be found here: [Islamic Geometry Lesson by: Sara Rezvi \(@arsinoepi\)](#). For further inspiration and to try out some designs yourself with a simple compass and a ruler, Samira [Mian's Islamic Geometry Art series](#) is thoughtfully designed and intriguing. I hope you can experience the pleasure of exploring how math and art are deeply connected for yourself!

'Visual Prompts'

Gretchen Bernabei taught English/language arts and reading in Texas for 34 years. You can find her work at www.trailofbreadcrumbs.net:

I was having some trouble getting adolescents to write essays. My department was preparing for some state testing, giving students practice prompts like “write about the importance of friendship” or “write an essay about the importance of honesty.” Many of our students wrote, “Friendship is really important,” or “Honesty is really important,” and not much more.

Clearly, students weren't plunging into the deeper meanings of those statements; they weren't grappling with the abstract; they weren't connecting the thoughts to their world at all. I thought about what those essays were asking students to do. They were asking students to write (and explain) an opinion; to state (and explore) a life lesson; to make (and substantiate) an argument.

And then I tried using artwork along with a “life lesson” statement. Like this:

With an image attached, they suddenly had plenty to say about the statement. At first, I used fine art, paintings I could show on my document camera, and then I moved to photographs. Some experimenting showed us that students like to call the sentences “truisms,” and they could write plenty of thoughts about those truisms. More experimenting taught us that showing the photos without the words was even better: Students liked to gaze at the photo, ask themselves what it's about, and make up a life lesson that fits. In this case, their truisms evolved from

“everyone likes pets” to “sometimes an animal speaks more clearly than a human” or “your dog will never hurt your feelings.” Their truisms became startlingly insightful.

There are so many royalty-free photos available through government agencies that it’s easy to find powerful photos.

The words could be translated into any language; the artwork transcends language.

A student reads the sentence out loud; the teacher asks, “Do you think that’s true?” If they do, they write the sentence at the top of their paper. If they don’t, they revise the sentence so that it’s now true for them.

Some more experimenting helped us develop what we now call the “11-minute essay.” Recalling the cubing exercise made popular by Elizabeth Cowan, we adapted the directions for a timed piece of writing:

Instructions for the 11-Minute Essay

- Write the truism on your paper. For one minute, explain what it means. (Stop them after one minute.)
- Indent and look at your truism. Can you think of a moment from a movie when this sentence was true? Name that movie and tell how this sentence was true in it. You have three minutes. If you can’t think of what to write, just keep looking at the picture.

(Stop them after three minutes.)

- Indent and look at your truism. Can you think of a moment from a book or story when this sentence was true? Name that story and tell how this sentence was true. You have three minutes. If you can’t think of what to write, just keep looking at the picture. (Stop them after three minutes.)
- Indent and look at your truism. How do you personally know it’s true? Tell one moment from your own experience when you saw this was true. If you can’t think of what to write, just keep looking at the picture. (Stop them after three minutes.)

- What does all this leave you wondering about that sentence? Indent and start your last paragraph with the words, “I wonder ...” or “This makes me wonder.” Or start it any way you like. You have one minute.

Both students and adults often become surprised at what they produced in such a short amount of time. The directions helped guide and translate onto the paper those thoughts which were already inside the writers. But the photos helped the writers plunge into their own experiences and beliefs.

You can find more visual prompts [here](#)  and [here](#).

References:

Bernabei, Gretchen and Judi Reimer (2013). *Fun-Size Academic Writing for Serious Learning: 101 Lessons and Mentor Texts*. Corwin Literacy. Thousand Oaks, CA.

Bernabei, Gretchen (2008). *Lightning in a Bottle*. Trail of Breadcrumbs Press. San Antonio, Texas.

Cowan, Elizabeth. (1986). *Writing*. Scott, Foresman. Glenview, Ill.

Art & Science

*Jeremy Hyler is a middle school English and media-literacy teacher in Michigan. He has co-authored Create, Compose, Connect! Reading, Writing, and Learning with Digital Tools (Routledge/Eye on Education), From Texting to Teaching: Grammar Instruction in a Digital Age, as well as Ask, Explore, Write. Jeremy blogs at [MiddleWeb](#) and hosts his own podcast *Middle School Hallways*. He can be found on Twitter [@jeremyballer](#) and at his website [jeremyhyler40.com](#):*

I worked closely with our art teacher on different projects to show cross-curricular connections for the students. While working across the hall from each other, we coordinated two specific activities that went with the science curriculum in my district. First, as my students worked on growing radish plants while experimenting with variables and control, they also were learning about stomata and the process of photosynthesis.

As one of our activities, we would gather different examples of leaves from around our school property. The art teacher would teach the students to do leaf rubbings in their physical-science notebooks by placing the leaf

behind the page and rubbing the pencil over the other side of it. It creates a rough sketch of the leaf, and then the students label the rubbings for identification purposes. Later (usually the next day), this would lead to a class discussion on the different species of plants that exist around our school's property and perhaps why we have such an abundance of certain species. It is an easy cross-curricular activity that allows students to be creative.

In addition to leaf rubbings and working on plant identification, the 8th grade students participate in a project called Salmon in the Classroom. During this project, students raise salmon throughout the school year from an egg to what is called a fry. During this project, students learn about water quality, macroinvertebrates, and other species of fish that exist in our waterways here in Michigan. At the end of the project, students have the opportunity to actively engage with these other species of fish when they release the salmon into a local creek.

One of the extensions of the project is for students to use paint and rubber fish stamps of native species to create an imprint of the fish they chose. The paintings are then hung on a classroom or hallway bulletin board to help younger grade levels get excited about the Salmon in the Classroom Project. It gives them something to look forward to in 8th grade.

Art & History

Kelsey Pycior teaches social studies at Manville High School in central New Jersey:

I teach high school social studies, but art is my hobby. I think that we can utilize art (drawings, paintings, music, poetry, etc.) in our daily lives to better express ourselves and connect with our larger communities. By the time students get to high school, art class is often optional.

I try to incorporate art multiple times per year in my courses. In my current school district, I have encouraged students to express themselves and demonstrate evidence of learning through various art projects that are intertwined with what they are studying. My world history students have hand drawn Instagram posts role-playing as the First, Second, and Third Estates of the French Revolution. Students have gotten on the floor and sketched art upside down, as though they were Michelangelo painting the Sistine Chapel. They showed off their new knowledge of Renaissance art compared with Medieval art in this exercise while gaining appreciation for the talent of painters of that era.

Students have also created murals out of scraps of paper that they wrote Haiku poems on while we were studying Japan. U.S. History 2 students frequently create their own propaganda for topics such as World War I, the Great Depression's New Deal, and World War II. They've created illustrated ABC books about World War II topics and even designed graffiti that they would have painted on the Berlin Wall had they lived in that era. Students also watch performances from the Harlem Renaissance, and we trace it to modern music today.

A favorite activity my U.S. History 2 students participate in is the analysis of Vietnam War protest songs. We listen to music, talk about the lyrics, and connect those to what we see happening with the Vietnam War, the civil rights movement, and other rights activism of the 1960s and 1970s. Without the incorporation of art, history does not come to life.

Thanks to Sara, Gretchen, Jeremy, and Kelsey for contributing their thoughts.

Consider contributing a question to be answered in a future post. You can send one to me at lferlazzo@epe.org. When you send it in, let me know if I can use your real name if it's selected or if you'd prefer remaining anonymous and have a pseudonym in mind.

You can also contact me on Twitter at [@Larryferlazzo](https://twitter.com/Larryferlazzo).

Education Week has published a collection of posts from this blog, along with new material, in an e-book form. It's titled [Classroom Management Q&As: Expert Strategies for Teaching](#).

Just a reminder; you can subscribe and receive updates from this blog via [email](#) (The RSS feed for this blog, and for all Ed Week articles, has been changed by the new redesign—new ones are not yet available). And if you missed any of the highlights from the first 10 years of this blog, you can see a categorized list below.

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