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do you compute?

Combining Math and Poetry in the Classroom

BETSY FRANCO

As a teaching artist, I've often been struck by just how early students begin to emphasize (or identify with) the notion of the right or the left side of the brain, and how the subjects we teach tend to confirm that division. To offset this, I began introducing math poetry to young children and their teachers. In each classroom, mathematicians became poets and poets became mathematicians, and a new writing form emerged.

I called the form "mathematickles" and explained to my first classes of fourth and fifth graders that a *mathematickle* is a math problem in which words are substituted for numbers. Since it was September, I presented them with the following autumnal equations:

holes + nuts – nuts = squirrels' hide & seek[1]

crisp air
shadows tall
+ cat's thick coat
---
signs of fall

The children began writing before we'd even finished brainstorming topics, winking at me conspiratorially as if to say, "Isn't mine clever?" Most filled at least one page. I could hear the children's minds working as they composed. After fourth grader Kevin wrote "maggot x time = fly," a lively discussion ensued concerning whether a poem was addition or multiplication. In the end, we concurred with Kevin that the transformation of a maggot definitely constituted multiplication—it was too metamorphic to be mere addition. The same was true of Samantha's molten poem:

hot
x rocks
lava

In another poem, the meaning of a "remainder" in division became much more clear and palpable to everyone:

pop! R air
hole) balloon

—Rachel

By the end of the first class, we had all begun to appreciate the associative overlap between riddles, math problems, and poems.

Fifth grade teacher Gaelyn Mason was as delighted and open-minded as the children, only reminding them to stay clear of crude topics. Nan Knoblauch, the fourth grade teacher, commented, "Their personalities, their individualism, their interests come through and they hear each other." Debbie Graham, a fifth grade teacher who saw the results, added, "It's so simple, it's profound. Learning in poetry and math is about making connections, and that's what this allows for."

While I was pleased with this affirmation, I was eager to continue the experiment. Would mathematickles work with younger children? Everyone's eyes were on me when I showed examples of addition and subtraction poems such as the ones below to a class of second graders.

maple leaves + puddles = crimson ships

nest - bird
= stringfeatherstwigsleaves

I feared that the "crimson ships" metaphor would be a stretch for the second graders, but the fact is it takes a child to see a leaf as a ship! In some ways, these problems are like diagramming sentences, only more fun. They break down the logic of poetry, the logic of let's-pretend, and kids can see the ingredients of their own imaginations.

On chart paper, we made a list of general topics and wrote some sample poems cooperatively. Then everyone started writing, even ELL students jumped in without trepidation. What's wonderful is that writing mathematickles only requires a knowledge of nouns, and nouns are the easiest form of speech when learning a new language. The second graders (native and non-native speakers alike) created haiku-like poems that exceeded all expectations:

Earth - light = night
—Clifford

Africa + BOOMBoom = drummaker somewhere
—Aaron

three green hearts + a green vine = a clover
—Angela

A few days later, I was mowing the lawn, when I came across a thriving bunch of sour grass with giant clover-like petals. They were perfect green hearts, something I would never have noticed before Angela's poem.

Word got out. Soon thereafter, I was approached by middle school teacher Ryan Peterson for my input. He was determined to have his eighth graders write math poetry based on algebra. His students' poems took on elements I could not have foreseen: they integrated the distributive, associative, and identity properties into Zen-like lines. In the syllogism below, eighth grader Philip used the Transitive Property of Equality to humorous yet earnest effect.

If I = nobody
and nobody = perfect
then I = perfect

Eighth grader Ming-Yun used an elongated, parenthetical equation format to emphasize the fickle nature of friendships, particulary in middle school: "(friend + me) + friend's friend= friend + (me + friend's friend)." Some of the poems began to bear a striking resemblance to some of e.e. cummings's curious conundrums:

Someone + noone = someone
—Lindsay

A week later, ESL teacher Annette Isaacson allowed me to observe while she introduced mathematickles to her students. I was fascinated by the variations that took place: how the equations could assume the form of a joke or a landscape poem.

dog - bark = quiet please
—Joshua

clouds + mountain = rain
—Claudia

Joshua originally wrote just the word "quiet," then asked me if he could make a joke and added the word "please." Again, I saw the twinkle in his eyes. In the ELL room and in other instances, when I would try to intervene with prompts, the children would look at me as if to say, "I don't need help. I'm thinking." They were making connections in their minds about subjects they knew personally, and felt strongly about, and they needed time to formulate their thoughts.

Teachers who saw their work concluded that we usually ask ELL children to write about what they don't know instead of letting them tell us what they do know. Instead of letting them explore their imaginations, we ask them to stick to the point—learning English. Annette Isaacson remarked, "You can see how smart they are [from their mathematickles]."

I branched out still further from there. I wanted to find out what would transpire if I encouraged children to write more traditional-looking math poetry. In second and third grades, the resulting poetry was anything but conventional. After compiling a list of predators and prey with second graders, I showed them how to transform a typical subtraction problem into a poem. If only "word problems" in textbooks could be as intriguing, in language and in narrative, as the children's surreal poems.

Cows and Vampire Bat

5 chocolate cows eating
very very wet grass.

Along flew a vampire bat.
4 cows moseyed away.

How many are left?

—Chris

The next week, we wrote "shape riddles," which use poetic language to explore geometric shapes. The riddles elicited a remarkable shift in subject matter. Morgan, for instance, who normally writes about battleships, airplanes, and war, wrote about mountains. He was very pleased to inform me that his was a *poem*, not a riddle.

Mountains

I am as gray as rain clouds,
black as space,
snow as white as
clouds on my big rocky face.

I am a triangle that
has so many curves
I look like the hat of a witch
with a stream that's as small as a ditch.
The climbers that climb me
look like black little dots
returning from lumbering
to warm little cots.

—Morgan

One of the most important aspects of math poetry is that there are no wrong answers. This open approach can help many children relax around math and around poetry. The children can break the rules, they can dive into their imaginations, they can explore numbers in a poetic way. As children and teachers use both sides of their brains at the same time, mathematics and poetry combine, resulting in a "chemical reaction" that opens children's minds in ways they haven't experienced before, and we haven't seen before.

Notes

1. Unless a student's name is indicated, all mathematickle examples in this essay are drawn from Betsy Franco's *Mathematickles!* (New York: Margaret K. McElderry Books), 2003. Copyright © Betsy Franco. Please note: Students' names have been abbreviated to protect privacy.