Widening the Circle: Poetry, Math and Beginning Adult Students

by

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Reidar learned woodworking in his native Norway, and these days uses tripod and level to angle the floors he lays. Hilda sews clothing for her family, mapping out her own patterns and estimating how much fabric to buy. Floyd does interior work, installing dry wall, and can quickly assess a job’s worth by sizing the room to be painted.

Clearly, these students, like many of the dozens I’ve met as Writing Consultant to the Brooklyn Public Library Adult Literacy Program, are familiar with some of the concepts behind spatial reasoning, fractions and percentages. In our workshops they become grounded in new information and control its application by drawing on these experiences and trusting their ability to estimate.

Writing is another vital component of these workshops, because it invites reflection on math processes and brings humor, personal values, points of view and beliefs into our sessions. Through writing poetry — which emanates individual style, even in its shortest forms — students organize numerical concepts within the context of their lives. Poems also give license to metaphors, through which students take their learning an extra step, translating the material world into symbols (such as measurements), then exploring other meanings that math language implies.

Working in pairs, coaching each other along, the students take turns at modeling various quantitative processes. They revise their math strategies, and revise their writing, ultimately shaping both forms of communication into messages that matter, solutions that make life easier.

Recipes for Learning Fractions

Capable, creative cooks abound in our workshops. Having learned the skill from family and friends, rather than from books, the students easily recite recipes from memory, as Helene did describing her specialty, Caribbean fish and gravy. This dish, which calls for white snapper prepared with Jamaican jerk sauce, lemon juice, olive oil, vinegar and bullion, feeds ten people. Once, though, Helene told us she was asked to prepare it for a bridal shower with 30 guests.

Using this situation as our model exercise, the group set out to determine how much Helene had to increase ingredients to make her fish recipe for the party. Eventually, everyone agreed to triple their amounts. Students drew series of rectangles, dividing them into parts that represented fractional amounts in the recipe, then counted those up.

This fleshing out of quantities made the formulaic approach to multiplying fractions seem less mysterious, and after I modeled that process, several in our group demonstrated it on our large newsprint pad. Keeping us connected to experience, another student, Teresa, brought up a good point: When the recipe is
trumped, is the fish marinated three times as long? Another person jokingly asked, when buying half a fish, which half do we ask for?

All this talk of dividing things up led into writing time in which we examined how our lives are divided, what brings people together, or how we feel to be part of some large whole. Nelly, who is from Honduras, wrote a poem to which the group nodded in agreement:

I am a whole person
but not complete.
A fraction of my life is missing
because it is divided into two
different worlds.
My heart is divided in two poles;
half of it is in the North
and half of it is in the South.
If someday I could bring together
the two poles
I would be whole
and I'll be happy and complete.

This heartfelt piece of writing demonstrates another kind of division, that of text into units of meaning. Carefully, Nelly has broken her poem into lines, highlighting its main ideas and creating a dignified pace.

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Later, returning to fractions in the math sense of the word, we guessed the length and width of spaces in our room, then measured our floor for square yards. Looking at a sales circular, we determined what it would cost to carpet our room, rounding off figures to the high end, rather than the low, because it is better to have too much floor covering than too little.

To decompress from this intensive session, we also talked about things that cannot be measured with rulers and tape, such as a person's character and personality. One new writer in our group refers to these concepts in her poem, "Measuring People":

I measure people many ways.
You measure them for clothes.
The way they conduct themselves
in and out of their home.
The way they talk to people.
You can measure people
by their smile
by the way they deal with children
by their warmth and comfort.

Another student, Adam, describes with wry honesty the way his family tugs at his time:

Time for wife
Time for mother
Time for father
I'm just an hour glass
Turn me over
I'm just an hour glass
My sand is tricking away.

Elizabeth, a serious young woman, writes:

I am one third of a whole
and my husband is one third
and our son is one third.
We are a whole family.
Together we are one, but we are
three people individually.

As we wrap up our work on fractions, one person in our group, Daisy, called out the roles in her life, which I listed on the pad: mother, girlfriend, friend. "That's all there is," she said, but her friends teased her into adding: joker, sister, home girl, hanger outer, video watch, cat lover — 16 roles altogether, each claiming, the group determined, 1/16 of Daisy's energy. Looking at these roles illustrated on a large circle graph of 16 parts, the group then sensed a flaw in their reasoning; the parts shouldn't all be the same size, because each role doesn't hold the same value in Daisy's life.

The Payoff to Learning Percentages

Our solution for graphically showing the priorities in Daisy's life introduced the group to a new topic, percentages. Keeping in mind that 100 percentage parts equal a whole (just as 100 cents equal a dollar), Daisy assigned a 30% value to her responsibilities as a mother, then wrestled out values for her other roles with the remaining 70%. Later, she wrote this poem:

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THE QUARTERLY 21
...I am a niece, I am a sister, I am a daughter, I
am a girlfriend, I am a soldier, I
am a fighter, I am a writer, I am a poet, I'm a
dreamer, too, and I am a aunt.
It all equal to 50%.
The other half of my ... life is:
in my dreams, I am an artist, I am a successor,
I am a model, I am an actor, I am a move
director, I am a college graduate, I am a home
owner, I'm a rich woman, I am a truck driver,
I'm also a panther owner.

Percentages seem to elicit mixed feelings from stu-
dents, from frustration at the chunks taken out of our
paychecks, to delight at the saving trumpeted by
percentages off of advertised prices.

One way the students work with percentage val-
ues is to choose a store item then estimate its sale
price, after a given percentage is taken off. Having
shopped for their families on tight budgets, the
class also shares expertise in evaluating a product's
worth. Some in the group recommend sticking
with reliable brand names, others look at a
product's features. Questions come up: What's the
difference between water resistant and waterproof
watches? Is a cotton nightgown going to hold up in the
wash? How much space can an air conditioner
with 5,000 BTUs keep cool?

After one intensive session, we wrote a group poem
called "Knowing the Value," which includes the lines:

Bargain.
Buy it!
Shop till you drop!
Buy today, pay tomorrow!
Buy today, worry tomorrow!

Vigorously, the group read this poem aloud, laughing at
the lines which parrot the barrage of messages we receive
on radio, television and in print, urging us to consume.

Adding Depth to Familiar Shapes
While percentages and fractions seem more useful in
the context of money, the names of polygons and
other shapes seem more meaningful when viewed
along with their root words and connotations. Familiar
words such as "circle" take on more significance
when considered in relation to "circulate" and "cir-
cus." Deciphering less familiar words such as "tri-
pod" and "tri-state" is easier once "triangle" is looked
at in relation to its root word, "tri-," meaning "three."

We also identify types of angles and lines. Having just
passed her driver's test, one student was happy to
define "parallel" in terms of parking. Very often, the
writing that comes out of these sessions is fueled by
personal associations. One student writes:

I see my life like a triangle.
At the bottom is straight then it goes up.
Lots of good things start happening and all of a sudden it
goes down again.

These discussions benefit from the time we have spent
measuring length and width, exercises that made
some of us wonder: Why are our homes based on
square angles in the first place? How do building
materials cater to this shape? What would it feel like
to live in a round place?

Josie, a student who connects curves to the nourishing
atmosphere of her kitchen writes:

In my kitchen they're
round juicy
apples.
I make my juicy round apple pie.
In my round kitchen I look for my
round pot and pan.
Oh my wonderful round
kitchen.

Less optimistically, another student analyzed his
former marriage:

It was like a circle
because you feel like getting in
and getting out
of the circle...
And some people
don't give second chances.

By moving from flat to three-dimensional shapes,
the students are able to talk about the various
connotations of the word "depth" — what gives a
piece of writing, a person, or a movie depth? A
good song, one student says, "comes from deep in
your soul." A "deep" person, according to some-
one else, is a person who cares about other people.
One student developed his thinking about the concept of depth with these lines:

I think Nemo is a flat person
because he don’t want school lunches
and he take from the poor
and give to the rich.

Investigating dimension and shape by consulting nature books from the Learning Center’s shelves, one group collectively wrote the poem, “Animal Shapes”:

A fox’s ear
   can be called a pyramid.
The kingfisher’s beak
   is like a pyramid.
...The young salamander egg
   is a sphere. The eyes of the bullfrog
   are like a barrel.

After discussing the geometric definition of a line—that is, a set of points extending in two directions without end—our group talked about whether or not we believed in the concept of infinity, and one student wrote the following:

I feel
   that the line best fits me.
Because with reading
   I can accomplish
   unlimited
   goals. Like a line,
   with reading
   my achievements
   have no
   ending.

Final Total
Long ago, my father tried to help with my math homework. Eyes watering I swallowed yawns, and watched him tap his pencil on my textbook as he soberly read aloud a word problem for the umteenth time: Two trains left the station at the same time ...

In college, I took a class jokingly called “Math for English Majors,” my last chance, it seemed, to acquire knowledge in an area that had long eluded me, a shore that receded, however hard I swam toward it. It helped, before and after these sessions, to commiserate with classmates who considered themselves equally impaired, but I realize now we might have learned faster if we had been encouraged to interact during class time itself.

Not surprisingly, it is a great relief to me when students in the math/poetry workshops I lead at the library begin consulting together, passing papers back and forth, teasing each other as they pour rice from measuring cups, tear ads out of sales circulars and examine each other’s receipts. The momentum created in our sessions depends on this interaction, if it is to truly take root in their lives. Generously applauding each other’s poems, calling out instructions to each other as they take turns with a marker at the large newsprint pad, they are building far more than rote skills.

Josie, for example, announces she is going to estimate the tax on items before she buys them. Alfredo relays a sobering new sense of how much interest he pays on his credit card account, and Sonia feels better equipped to help her son with his math homework. Theodore intends to do more of the calculating—and less of the digging—in his construction work in New York City tunnels, and I have goals too: to be a better teacher and writer, better able to compare an abstraction to something that can be breathed and felt. My students and I aren’t all going in the same direction, but we do know where we want to be.

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